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

In the Matter of	)	
	)	
International Comparison and Consumer Survey Requirements in the Broadband Data Improvement Act	)	GN Docket No. 09-47
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act	)	GN Docket No. 09-137

REPLY COMMENTS OF FIBERTOWER CORPORATION, THE RURAL TELECOMMUNICATIONS GROUP, INC., COMPTEL, AND SPRINT NEXTEL CORPORATION – NBP PUBLIC NOTICE #6

FiberTower Corporation ("FiberTower"), the Rural Telecommunications Group, Inc. ("RTG"), COMPTEL, and Sprint Nextel Corporation ("Sprint Nextel") (collectively, the "Coalition") submit these Reply Comments in response to the Federal Communications Commission's ("FCC" or "Commission") Public Notice entitled "Comment Sought on Spectrum for Broadband," released on September 23, 2009 in the above-captioned proceeding.[1] In its Comments, the Coalition encouraged the Commission to act quickly on its pending proposal to allow licensed, fixed point-to-point use of the TV White Spaces on UHF TV Channels 21-35 and 39-51 for: (1) up to six vacant TV White Spaces channels second or greater adjacent to a TV

[1] *Comment Sought on Spectrum for Broadband – NBP Public Notice #6*, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, DA 09-2100 (rel. Sept. 23, 2009) ("*Notice*").

broadcast station in rural counties; and (2) any vacant TV White Spaces channels third or greater adjacent to a TV broadcast station in all counties.[2] In addition to the Coalition members, a number of other commenters also support this proposal, including T-Mobile USA, Inc., the Association for Maximum Service Television, Inc. and the National Association of Broadcasters, and the Wireless Communications Association International, Inc.[3]

In these Reply Comments, the Coalition addresses erroneous claims by Motorola, Inc. ("Motorola") and Microsoft Corporation ("Microsoft") regarding the Coalition's proposal and encourages the FCC to reject these attempts to thwart broadband deployment in unserved and underserved rural areas.

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[2] Comments of FiberTower, RTG, COMPTEL, and Sprint Nextel – NBP Public Notice #6, GN Docket Nos. 09-47, 09-51, 09-137 (filed Oct. 23, 2009) ("Coalition Comments"); *see also e.g.*, *Ex Parte* filing by FiberTower, Sprint Nextel, RTG, and COMPTEL, GN Docket No. 09-51 and ET Docket Nos. 04-186, 02-380 (filed Nov. 11, 2009) ("November 11 *Ex Parte*"); Comments of FiberTower, RTG, COMPTEL, and Sprint Nextel – NBP Public Notice #11, GN Docket Nos. 09-47, 09-51, 09-137 (filed Nov. 4, 2009); *Ex Parte* filing by FiberTower, Sprint Nextel, RTG, and COMPTEL, ET Docket Nos. 04-186, 02-380 (filed Oct. 28, 2009) ("October 28 *Ex Parte*"); Request for Expedited Consideration filed by FiberTower, RTG, COMPTEL, and Sprint Nextel, ET Docket Nos. 04-186, 02-380 (filed July 14, 2009); Reply to Oppositions filed by FiberTower, RTG, COMPTEL, and Sprint Nextel, ET Docket Nos. 04-186, 02-380 (filed May 18, 2009) ("Reply to Oppositions"); Petition for Reconsideration filed by FiberTower, RTG, COMPTEL, and Sprint Nextel, ET Docket Nos. 04-186, 02-380 (filed Mar. 19, 2009); *Ex Parte* filing by FiberTower, Sprint Nextel, RTG, and COMPTEL, ET Docket Nos. 04-186, 02-380 (filed Oct. 31, 2008); "Optimizing the TV Bands White Spaces: A Licensed, Fixed-Use Model for Interference-Free Television and Increased Broadband Deployment in Rural and Urban Areas," *Ex Parte* filing by FiberTower and RTG, ET Docket Nos. 04-186, 02-380 (filed Oct. 2, 2007) ("White Paper").

[3] *See, e.g.*, Comments of T-Mobile USA, Inc., WT Docket No. 09-66 and GN Docket Nos. 09-157, 09-51, 28 (filed Sept. 30, 2009) ("T-Mobile Competition and Innovation Comments"); Comments of the Association for Maximum Service Television, Inc. and the National Association of Broadcasters – NBP Public Notice # 6, GN Docket Nos. 09-47, 09-51, and 09-137, 13-14 (filed Oct. 23, 2009) ("MSTV and NAB Comments"); Comments of the Wireless Communications Association International, Inc., GN Docket No. 09-51, 45-47 (filed June 8, 2009); *see also* Comments of FiberTower Corporation – NBP Public Notice # 11, GN Docket Nos. 09-47, 09-51, and 09-137, 2, 8-9, 18 (filed Nov. 4, 2009); Comments of FiberTower Corporation, GN Docket No. 09-51, 8-10 (filed June 8, 2009); Reply Comments of Sprint Nextel Corporation, GN Docket Nos. 09-157, 09-51, 13-14 (filed Nov. 5, 2009); Comments of Sprint Nextel Corporation, GN Docket Nos. 09-157, 09-51, 33-35 (filed Sept. 30, 2009); Comments of the Rural Telecommunications Group, Inc., GN Docket Nos. 09-157, 09-51, 2, 6 (filed Sept. 30, 2009); Comments of COMPTEL, GN Docket No. 09-51, 22-23 (filed June 8, 2009).

Motorola. Motorola supports fixed broadband use of the TV White Spaces in its comments, stating that the TV White Spaces are "well suited to providing broadband services."[4] Despite this support, it argues that the TV White Spaces are "less than ideal" for wireless backhaul services, asserting that larger antennas would be needed to provide point-to-point services and that those antennas likely would not enable aggressive frequency reuse.[5]

The Commission should ignore Motorola's unpersuasive claims. As an initial matter, Motorola fails to recognize the limited nature of the Coalition's narrowly tailored proposal, which only extends to UHF TV Channels 21-35 and 39-51 and is further limited to six vacant channels in rural areas and the rarely available third or greater adjacent channels elsewhere. Today anywhere from 15-to-45 or more vacant channels exist in rural areas. Compared to the microwave bands, smaller, lighter, and less expensive antennas are available for these TV Bands.[6] In addition, the longstanding use of the TV Bands for Broadcast Auxiliary Service ("BAS") point-to-point links (some of which are 50-80 miles long or more) illustrates the off-the-shelf availability of point-to-point equipment for backhaul use in UHF TV Channels 21-35 and 39-51. More than 300 fixed links have already been licensed and installed in the TV Bands under the existing BAS rules.

Using available antennas, new licensed, point-to-point service in a portion of the TV White Spaces could provide an important tool to reduce the costs of wireless backhaul by as much as 80-90% in rural areas and enhance broadband deployment. For example, a single 75-mile or longer wireless backhaul link could be constructed at a cost of $100,000 – $200,000

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[4] Comments of Motorola, Inc. – NBP Public Notice #6, GN Docket Nos. 09-47, 09-51, 09-137, 18 (filed Oct. 23, 2009) ("Motorola Comments").

[5] *Id.*

[6] *See* November 11 *Ex Parte*, attachment at 16-18, 20.

using two small lightweight antennas, whereas covering the same distance using 3.65 GHz, 6 GHz, or higher frequency spectrum would require as many as four relay towers and a total of 10 six-foot diameter dish antennas, at a cost of $3 million or more. When the received signal-to-noise ratio is sufficient, these links would be able to operate with up to 128 QAM with a maximum data rate of approximately 41 Mbps in a 6 MHz channel (64 QAM is likely to be more typical, with a maximum data rate of approximately 28 Mbps gross and 20-25 Mbps net after coding).[7] Thus, the favorable propagation characteristics of the TV White Spaces make the bands particularly ideal for backhauling traffic over very long distances (*e.g.*, 50-70 miles and longer) at low cost.[8]

The Coalition has proposed limiting fixed, licensed use to UHF television spectrum because of the availability of existing antennas and other equipment for that band. As the Coalition has noted, larger, less practical, and more costly antennas would likely be needed in the VHF TV Bands to deploy fixed, point-to-point services.[9] Although point-to-point antennas in the TV bands would not have the same level of directionality and frequency reuse that is currently provided by antennas operating in the microwave bands, backhaul and other fixed point-to-point services can still be deployed efficiently and effectively – particularly in rural areas – by using these existing antennas just as BAS licensees have done for years. Spectrum is less congested in low-density rural areas, and intensive frequency reuse is less critical there than it is in urban areas. The TV White Spaces channels are widely available in rural unserved and underserved areas because there are fewer TV stations and other TV band transmitters operating

[7] These rates could be doubled by using dual polarization, and the rates could be lower for longer links with a low received signal-to-noise ratio.

[8] Distance is directly correlated to different variables, which include and are not limited to: power, signal availability, data throughput, antenna characteristics and locations, and channel placement within the TV White Spaces.

[9] October 28 *Ex Parte* at 2.

there. Thus, even considering the impact of new unlicensed operations and the excellent propagation characteristics of the TV Bands, there will still be substantial amounts of unused spectrum available in many areas for licensed, fixed point-to-point services.

Microsoft. In reply comments filed recently in the Commission's *Wireless Innovation and Investment NOI* proceeding (which shares GN Docket No. 09-51 with this proceeding),[10] Microsoft opposes licensed, fixed point-to-point use of a portion of the TV White Spaces for wireless backhaul and other applications, repeating the tired argument that such operations are not an efficient use of the TV White Spaces and "will preclude unlicensed operations."[11]

As the Coalition has explained previously, in unserved and underserved areas, licensed, fixed point-to-point wireless services are the most efficient and most needed use for the TV White Spaces.[12] The proposed backhaul and other fixed wireless systems can literally "light" an unserved or underserved community by connecting its mobile, wireline, commercial, public safety, educational, medical, and government broadband needs back to switches or the Internet, on a more cost-effective basis than anything else currently available.[13]

Furthermore, the low density of consumers in rural areas noted above, coupled with the limited power and transmission range of the proposed unlicensed TV Bands devices, makes it highly improbable that a full 15 to 45 channels of TV White Space could possibly be needed or used by those devices. Indeed, it is far more likely that prohibiting fixed licensed operations in

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[10] *Fostering Innovation and Investment in the Wireless Communications Market, A National Broadband Plan For Our Future*, Notice of Inquiry, 24 FCC Rcd 11322 (2009) ("*Wireless Innovation and Investment NOI*").

[11] Reply Comments of Microsoft Corporation, GN Docket Nos. 09-51, 09-157, 11 (filed Nov. 5, 2009) ("Microsoft Reply Comments").

[12] Reply to Oppositions at 3.

[13] *See id.*; *see also* MSTV and NAB Comments at 13-14 (stating that "one way to improve broadband access in rural areas is through use of 'white spaces' spectrum between television channels for fixed broadband access").

rural areas – and allowing the spectrum to continue to lie fallow for many years – would be significantly less spectrally efficient than permitting such use. Although the TV Bands are congested, multipurpose bands (especially compared to the relatively clear bands that the Commission auctions for exclusive use), they are much less utilized in rural areas. Thus, providing for limited licensed use greatly improves spectrum efficiency by increasing the chance that there will be some utilization of the TV White Spaces in rural areas, especially given that off-the-shelf equipment for licensed use is already available today and the need for cost-effective backhaul is particularly urgent to provide broadband service to rural areas (by licensed as well as unlicensed providers).

Authorizing *licensed* use in a portion of the TV White Spaces further encourages efficient spectrum use. Unlike proposed unlicensed TV bands devices, licensed users would incur real costs (including various regulatory and coordination fees) and short-term build-out obligations and construction expenses in exchange for their spectrum usage. Licensees of the fixed links would have an obligation to construct and begin using the spectrum within 18 months of licensing.[14] On the other hand, it is not clear when or even if unlicensed devices will be available in this spectrum in rural America, and it may take years just to complete the development, equipment certification, and manufacturing process to begin introducing such products in urban markets.

In addition to maximizing efficient spectrum use, the Coalition's proposal would not preclude unlicensed operations. Unlicensed devices would still be able to operate on channels in the TV Bands that are designated for fixed licensed use, subject to the normal non-interference protections afforded to licensed users when they are present and operational. Thus, from a

[14] This assumes that the Commission extends the Part 101 rules to new licensed, fixed operations, as the Coalition has proposed.

practical perspective, unlicensed TV Bands devices would see absolutely no reduction in the amount of useable spectrum anywhere, unless and until a fixed wireless path has actually been licensed and constructed in a given area, and the path somehow limits unlicensed operations in all or some section of that path's operating area.

The Thanki Study. Microsoft also attached to its reply comments a study by Richard Thanki,[15] in which Thanki concludes (among other things) that there is little potential for economic benefit from licensed uses of the TV White Spaces, including licensed use for wireless backhaul.[16] He suggests that such use of the TV White Spaces would only provide a short-term backhaul solution to problems faced by carriers, and that spectrum below 1 GHz is not ideal for backhaul use because of its propagation and other characteristics.[17]

The Coalition's proposal will not provide a solution for all of the special access or backhaul problems facing wireless carriers or eliminate the need for the FCC to take separate action on pending special access issues. Nevertheless, it will provide an urgently needed, cost-effective tool for affordable middle mile backhaul for wireless carriers and Internet service providers in rural areas, with a dramatic cost savings compared to other backhaul options available for providing wireless broadband to remote communities. Unlike FiberTower, Sprint Nextel, and certain member carriers of RTG and COMPTEL, neither Mr. Thanki nor Microsoft is in the business of committing capital for the build-out of wireless infrastructure, including backhaul solutions. The members of the Coalition, relying on their considerable expertise in these matters, have carefully analyzed the economic benefits of using the TV White Spaces for

[15] "The Economic Value Generated by Current and Future Allocations of Unlicensed Spectrum," Richard Thanki, attached to Microsoft Reply Comments.

[16] *Id.* at 48.

[17] *Id.* at 47.

wireless backhaul and would not be expending time and resources in advocating for this change to the Commission's rules if they were not convinced of the advantages of such use.

With respect to the feasibility of using the TV White Spaces for new backhaul deployments, Thanki ignores the fact that the TV White Spaces is already being used for backhaul-type point-to-point BAS services. Moreover, as discussed above, the economics for providing backhaul in a portion of the TV White Spaces are highly superior to fixed microwave operations or fiber optics over long distances, and there are very few options available in the low frequency bands for long-distance backhaul.[18] The Commission has allocated spectrum below 3 GHz for fixed point-to-point use in the past, but much of that spectrum has been reallocated to other uses (including mobile services), forcing operators of fixed point-to-point services to relocate to higher microwave spectrum bands with different propagation characteristics. These microwave wireless backhaul solutions provide attractive solutions for shorter-distance and high-capacity services, but they are not as attractive for providing wireless backhaul services over longer distances or serving areas with small populations and lower capacity needs, given the much higher equipment costs.

The Commission should ignore the Motorola and Microsoft claims; licensed, fixed point-to-point use of a portion of the TV White Spaces will facilitate and expedite the deployment of broadband services, primarily in rural unserved and underserved areas. By adopting the Coalition's proposal, the Commission has a unique and practical opportunity to advance its broadband and competition policy goals and encourage the deployment of wireless broadband services in "prime" spectrum, especially in rural areas.

[18] White Paper at 9-10; *see also* T-Mobile Competition and Innovation Comments at 28 (stating that the FCC could "improve the viability of competitive wireless backhaul by making spectrum—particularly a portion of the TV white spaces spectrum—available for this use").

Respectfully submitted,

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