

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	

To: The Commission

**CONSOLIDATED OPPOSITION TO  
PETITIONS FOR RECONSIDERATION**

**THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION**

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May 8, 2009

## Table of Contents

Summary.....	i
Discussion.....	2
I. <b>THE RECORD DEMONSTRATES WIDESPREAD SUPPORT FOR           ELIMINATING THE SPECTRUM SENSING REQUIREMENTS.....</b>	<b>2</b>
A. <u>Spectrum Sensing Is Not Necessary To Protect Incumbent Broadcast               Stations Or Licensed Wireless Microphones.....</u>	<u>2</u>
B. <u>The Commission Should Reject Shure’s Proposal To Further Burden               TVBDs With New Spectrum Sensing Requirements.....</u>	<u>4</u>
C. <u>The Commission Should Adopt WISPA’s Revised Proposal For               Wireless Microphones.....</u>	<u>6</u>
II. <b>THE COMMISSION SHOULD RELAX ITS ANTENNA AND BASE           STATION HEIGHT RESTRICTIONS.....</b>	<b>9</b>
III. <b>THE COMMISSION SHOULD INCREASE POWER LIMITS FOR           FIXED WHITE SPACE USE.....</b>	<b>11</b>
IV. <b>THE COMMISSION SHOULD REJECT PROPOSALS THAT           WOULD IMPOSE NEW DISTANCE AND POWER RESTRICTIONS           ON FIXED TVBDs.....</b>	<b>12</b>
A. <u>NCTA’s Indoor Test Results Are Flawed.....</u>	<u>13</u>
B. <u>NCTA’s Indoor-to-Outdoor Extrapolation Is Flawed.....</u>	<u>15</u>
C. <u>NCTA Misunderstands How Fixed TVBD Antennas Will Be               Installed.....</u>	<u>16</u>
D. <u>The Commission Should Reject NCTA’s Proposal To Require               TVBDs To Coordinate With Cable Operators.....</u>	<u>16</u>
V. <b>THE COMMISSION SHOULD AMEND SECTION 15.711(f) TO           PERMIT FIXED BASE STATIONS TO HAVE MULTIPLE FIXED           CLIENT DEVICES.....</b>	<b>17</b>
Conclusion.....	18

## Summary

The Wireless Internet Service Providers Association (“WISPA”) opposes certain of the petitions for reconsideration filed in this proceeding, and supports positions taken by other petitioners that would promote flexible deployments and affordable broadband service in television white space spectrum, particularly to consumers and businesses in rural, unserved and underserved areas of the country.

As demonstrated in its attached Consolidated Opposition and its earlier-filed Petition for Reconsideration (“Petition”), the Commission has the opportunity to modify its regulatory scheme to eliminate unnecessary costs, reduce installation and regulatory burdens and mitigate the potential for interference. The Commission also should reject proposals that would discourage investment in and deployment of fixed white space devices, thereby undermining the Commission’s objective to promote use of the spectrum for fixed broadband access.

WISPA and a host of other petitioners agree that the Commission should eliminate spectrum sensing requirements in light of the geolocation registration and access requirements that render unproven and unreliable sensing technology unnecessary to detect the presence of wireless microphones, the vast majority of which are not licensed. Moreover, spectrum sensing would impose significant equipment and implementation costs that would make service less affordable to consumers. The Commission should abolish its sensing requirements and thereby ensure that its regulatory scheme does not elevate the interests of unlicensed wireless microphone users that don’t need sensing protection over the interests of consumers in rural, unserved and underserved areas that would continue to lack access to affordable broadband services.

The Commission should reject Shure’s proposals that would, contrary to the broad-based consensus of other petitioners, increase certain sensing obligations for white space users. Aside from the compelling reasons for eliminating sensing altogether, more frequent in-service monitoring would serve only to increase the number of times a TVBD detects unlicensed wireless microphones that are not currently entitled to interference protection. Similarly, a TVBD should not be required to cease operations for a full hour if it detects an unlicensed wireless microphone. Shure also provides no good reason why the Commission should expand the one-kilometer protection zone for wireless microphones licensed under Part 74 of the Commission’s rules, especially given the Commission’s statement that wireless microphones can establish a larger area of protection by registering at multiple locations. Taken alone or together, Shure’s proposals serve no purpose other than to stifle fixed white space development by discouraging investment and unnecessarily increasing costs and compliance burdens.

Recognizing that unlicensed wireless microphones are here to stay, WISPA offers a new approach to accommodate the interests of both fixed TVBDs and wireless microphones.

- Unlicensed wireless microphones would register in the geolocation database and must access the database on the same terms as white space devices. By registering, unlicensed wireless microphones would be elevated to co-equal secondary status with TVBDs.
- In each market, two channels would be designated for unlicensed wireless microphones to use on a *non-exclusive* basis, and other white spaces users could use these channels as well if the geolocation database permits.
- Wireless microphones licensed under Part 74 would, as required by Commission rules, be registered in the geolocation database.

WISPA and other petitioners also asked the Commission to remove restrictions on the height of antennas and base stations. Maintaining 10-meter minimum height for receive antennas is unnecessary for spectrum sensing (if those rules are not eliminated), adds significant costs to fixed residential deployments and limits the flexibility of installers to locate antennas at the optimum location for reception and interference avoidance. The 30-meter maximum height for base stations is unnecessary to protect incumbent stations, which can enjoy protection by relying on existing distance and separation criteria to ensure the same level of protection. The ability to install base stations at higher elevations could substantially increase coverage and decrease the amount of equipment and number of transmitter sites, making fixed broadband access more affordable to consumers in sparsely populated areas.

WISPA also believes that the Commission should permit fixed TVBDs to operate at up to 20 watts of transmitter power, so long as incumbent stations retain the same level of protection at their contours. By artificially restricting power to 4 Watts EIRP across the board, the Commission is limiting coverage and increasing the number of sites that must be obtained to provide service. WISPA believes its plan is more spectrally efficient than a similar plan offered by the Public Interest Spectrum Coalition.

WISPA opposes the efforts of the National Cable & Telecommunications Association (“NCTA”) to require reduced power and separation restrictions on fixed TVBDs. As discussed in detail, NCTA’s indoor testing is severely flawed and its extrapolation of those results to outdoor environments relies on faulty assumptions. NCTA also incorrectly presumes that base stations will be installed indoors (though the Commission’s rules appear to permit indoor installation and should be clarified if this is not the intent). WISPA further opposes NCTA’s suggestion that fixed TVBD operators coordinate with cable operators. This approach would result in indefinite delays in the ability of TVBDs to serve the public with affordable broadband service.

Finally, WISPA agrees with those petitioners asking the Commission to permit base stations to have multiple fixed client devices. Coordination under IEEE standards will occur at the base station, so it is not necessary for each CPE to directly query the database.

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**CONSOLIDATED OPPOSITION TO  
PETITIONS FOR RECONSIDERATION**

The Wireless Internet Service Providers Association (“WISPA”), pursuant to Section 1.429(f) of the Commission’s Rules, hereby opposes certain petitions for reconsideration of rules adopted in the Commission’s Second Report and Order and Memorandum Opinion and Order in the above-captioned proceeding.<sup>1</sup> Although the majority of the petitions for reconsideration agreed with WISPA that spectrum sensing rules should be eliminated and other rules relaxed to promote affordable broadband availability, a few petitioners sought reconsideration of rules that would make effective WISP deployment in the TV white spaces spectrum less likely. In particular, WISPA disagrees with proposals of Shure Incorporated (“Shure”) that would increase the burdens on WISPs to unnecessarily protect wireless microphones by increasing the frequency of

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<sup>1</sup> See *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807 (2008) (“*Second R&O/MO&O*”). Seventeen parties, including WISPA, filed petitions for reconsideration. See Petition for Reconsideration of WISPA, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 (“WISPA Petition”). By *Order* dated April 22, 2009, the Commission’s Office of Engineering and Technology extended the deadline for filing oppositions to petitions for reconsideration to May 8, 2009 and the deadline for filing replies to May 18, 2009. See *Order*, DA 09-900, ET Docket Nos. 04-186 and 02-380, rel. Apr. 22, 2009. Accordingly, this Opposition is timely filed.

in-service monitoring and channel non-occupancy and greatly enlarging the size of protection zones.<sup>2</sup> WISPA also opposes the flawed efforts of the National Cable & Telecommunications Association (“NCTA”) to impose over-protective separation, power and coordination restrictions on fixed TVBDs.<sup>3</sup>

## **Discussion**

### **I. THE RECORD DEMONSTRATES WIDESPREAD SUPPORT FOR ELIMINATING THE SPECTRUM SENSING REQUIREMENTS.**

#### **A. Spectrum Sensing Is Not Necessary To Protect Incumbent Broadcast Stations Or Licensed Wireless Microphones.**

In its Petition, WISPA asked the Commission to set aside its rules requiring fixed TVBDs to employ “nascent” and unreliable spectrum sensing technologies.<sup>4</sup> WISPA pointed out that the Commission failed to consider the extraordinary burdens and costs that spectrum sensing would impose on WISPs, thereby creating the strong possibility that the TV white space band would be unsuitable for fixed deployments and would discourage investment for fixed TV white space deployments. WISPA further explained that, even if it were a reliable and proven technology, spectrum sensing is unnecessary to protect incumbents and licensed wireless microphones in light of the geolocation database registration and access requirements.<sup>5</sup>

WISPA was hardly alone in proposing to eliminate spectrum sensing requirements. A diverse cross-section consisting of an international standards committee, leading equipment and technology companies and public interest groups all agreed that

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<sup>2</sup> See Petition for Reconsideration of Shure, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 (“Shure Petition”).

<sup>3</sup> See Petition for Reconsideration and Clarification of the National Cable & Telecommunications Association, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 (“NCTA Petition”).

<sup>4</sup> See WISPA Petition at 4-6.

<sup>5</sup> See *id.* at 5.

sensing would impose unnecessary burdens and costs by requiring the use of a technology that is unproven and unreliable. Perhaps most significantly, IEEE 802, which originally opined that sensing is “essential” to provide the Commission with the framework for its sensing rules,<sup>6</sup> now believes that “sensing to detect broadcast TV signals should be optional” if a geolocation database is used.<sup>7</sup> Likewise, Motorola recommended abolishing the sensing requirements,<sup>8</sup> citing the Commission’s own test report demonstrating “that wireless microphone sensing is not yet a mature technology.”<sup>9</sup> The Wi-Fi Alliance concluded that “[a]lthough a sensing requirement would not provide much in the way [of] additional protection for licensed wireless microphone devices, it is clear that this requirement will impose significant implementation and equipment costs.”<sup>10</sup> The Public Interest Spectrum Coalition (“PISC”) observed that sensing for wireless microphones is “unnecessary when they can register their existence in the geolocation database.”<sup>11</sup> Dell and Microsoft agreed that “sensing is unnecessary for geolocation-enabled devices.”<sup>12</sup> Similarly, Adaptrum also asked the Commission to delete the spectrum sensing requirements in light of the “combination” of other

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<sup>6</sup> Comments of IEEE 802.18, ET Docket Nos. 04-186 and 02-380, filed Jan. 31, 2007 (“IEEE 802.18 Comments”), at 6.

<sup>7</sup> IEEE 802 Petition for Reconsideration, ET Docket Nos. 04-186 and 02-380, filed March 16, 2009 (“IEEE 802 Petition”) at 3.

<sup>8</sup> See Petition for Reconsideration and Clarification [of] Motorola, Inc., ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 (“Motorola Petition”), at 6.

<sup>9</sup> *Id.* at 12.

<sup>10</sup> Wi-Fi Alliance Petition for Reconsideration, ET Docket No. 04-186, filed March 17, 2009, at 4-5.

<sup>11</sup> Petition for Reconsideration of the Public Interest Spectrum Coalition, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 (“PISC Petition”), at 6.

<sup>12</sup> Petition for Reconsideration of Dell, Inc. and Microsoft Corp., ET Docket Nos. 04-186 and 02-380, filed March 19, 2009, at 3. Dell/Microsoft also noted that sensing will not distinguish between licensed and illegal wireless microphone operations, creating an environment where the illegal users could preclude legitimate fixed TVBD operations – a circumstance that registration in the geolocation database would overcome. See *id.* at 4.

interference mitigation mechanisms, including the database and safe harbor TV channels.<sup>13</sup>

The record is clear – maintaining the sensing requirements will do a great deal of harm while offering no benefits to incumbents or wireless microphones. Given this broad-based consensus, as well as the Commission’s own misgivings about the unproven and reliable nature of spectrum sensing, there can be little doubt that spectrum sensing is unnecessary, unproven and unreliable. It would be the ultimate irony if the Commission’s rules elevated the interests of wireless microphone users (in many cases unlicensed ones)<sup>14</sup> over the interests of consumers in rural, unserved and underserved areas that would continue to lack access to affordable broadband services. Abolishing the spectrum sensing rules will help ensure that the Commission’s vision of robust white space deployment becomes reality.

**B. The Commission Should Reject Shure’s Proposal To Further Burden TVBDs With New Spectrum Sensing Requirements.**

Standing alone against those demonstrating the prohibitive costs and deployment difficulties that sensing requirements would impose, Shure asked the Commission to increase the burdens on TVBDs in seeking a six-fold increase in the frequency of in-service monitoring<sup>15</sup> and imposing a 60-minute non-occupancy period during which a

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<sup>13</sup> Petition for Reconsideration of Adaptrum, Inc., ET Docket Nos. 04-186 and 02-380, filed March 19, 2007 (“Adaptrum Petition”), at 2.

<sup>14</sup> See PISC Petition at 8 (noting that fewer than 1,000 wireless microphone operators were licensed under Part 74, but estimating as many as 500,000 wireless microphone devices operating illegally). See also Adaptrum Petition at 2 (stating that “most” wireless microphones “are not used legally”).

<sup>15</sup> See Shure Petition at 12. See also Petition for Reconsideration of the Society of Broadcast Engineers, Inc. (“SBE”), ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 (“SBE Petition”), at 23-24. Section 15.711(c)(4) requires a TVBD to perform in-service monitoring for channel availability every 60 seconds. Shure proposes in-service monitoring every 10 seconds and SBE suggests in-service monitoring every two seconds.

TVBD must remain off-air if it detects a protected signal.<sup>16</sup> WISPA strongly opposes imposition of additional regulations that will further discourage investment in fixed TV white space deployment. First, as described above, the spectrum sensing requirements are unnecessary in light of the registration and database access requirements. Second, where the Commission itself acknowledged that sensing technology is unreliable, a six-fold increase in the frequency of in-service monitoring would lead to significantly more “false-positive” detections that would threaten reliable use of TVBDs. Moreover, in-service monitoring (as opposed to database monitoring) would not distinguish between the presence of licensed wireless microphones entitled to protection and unlicensed microphones that are not entitled to protection. Third, even if sensing requirements are retained, it would be regulatory overkill to require a TVBD to abandon a channel for a full hour if it detects a protected signal that may only be intermittent or itinerant. The existing in-service monitoring rules (if maintained) provide more than sufficient protection for wireless microphones. In fact, the “crowded RF environment” scenario Shure describes makes clear the point about sensing – it creates problems, not solves them.<sup>17</sup> In sum, Shure’s proposals would not make an unnecessary and unreliable sensing scheme better, but would make sensing even less reliable in protecting licensed wireless microphones.

WISPA also strongly opposes Shure’s proposal for a four-fold increase in the protective zone around microphones.<sup>18</sup> Here again, Shure ignores reality in seeking to

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<sup>16</sup> Shure Petition at 13.

<sup>17</sup> *Id.*

<sup>18</sup> *Id.* Section 15.712(f) prohibits TVBDs from operating within one kilometer of registered wireless microphone sites. Shure disingenuously refers to its proposal to increase the protection to two kilometers as “modest.” *Id.* By doubling the radius of the circular zone, Shure’s proposal would actually increase the protection zone by 400 percent – hardly modest by any estimation. WISPA further notes SBE proposed to protect wireless microphones within their “operational areas” as shown in ULS. *See* SBE Consolidated

limit TVBD deployment. Section 15.712(f) states that TVBDs will not be permitted to “operate within” one kilometer of the coordinates of a registered wireless microphone site. In adopting this rule, the Commission correctly concluded that a one-kilometer distance separation “recognizes the fact that wireless microphones and other devices used at an event site will be at relatively strong signal levels compared to unlicensed TVBDs.”<sup>19</sup> The Commission also noted that, for large event sites, the wireless microphone licensee could submit multiple registrations to the database administrator.<sup>20</sup> Shure’s reference to restoring a “level of proportionality” is misplaced in light of the operational restriction on fixed TVBDs that prevents any signal from operating within the one-kilometer boundary. As adopted, Section 15.712(f) is sufficient to protect registered wireless microphone use. Shure’s proposals should be rejected in all respects.

**C. The Commission Should Adopt WISPA’s Revised Proposal For Wireless Microphones.**

With the record clear that spectrum sensing is not necessary or advisable for protecting licensed wireless microphones, the question becomes how to best mitigate the potential interference to and from TVBDs while allowing for continued operation of unlicensed wireless microphones that are used in theaters, churches and other public venues. In their Petitions, WISPA and Motorola suggested that segregating wireless microphones to two designated channels would help mitigate the potential for harmful interference that unlicensed wireless microphones and TVBDs could suffer from each

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Opposition to Petitions for Reconsideration, ET Docket No. 04-186, filed Apr. 28, 2009, at 8. A cursory review of Low Power Broadcast Auxiliary Service licenses in ULS shows that “operational areas” are often defined as whole cities or 80.0 kilometer radius areas. WISPA plans to address SBE’s opposition in its Reply Comments, but notes that these licenses do not require protection to all areas at all times, and that a registration requirement will be adequate to afford licensed facilities an appropriate level of interference protection.

<sup>19</sup> See *Second R&O/MO&O* at ¶199.

<sup>20</sup> *Id.* See also Comments of the Wi-Fi Alliance to Deny the Shure Petition for Reconsideration, ET Docket No. 04-186, filed Apr. 27, 2009, at 3.

other.<sup>21</sup> WISPA stated that it “would prefer to ‘lose’ white space spectrum to accommodate wireless microphones than suffer the burdens of complying with onerous and expensive sensing requirements that could force WISPs to avoid the TV white spaces altogether.”<sup>22</sup> Taking a different approach, PISC argued that “blocking-off valuable channels exclusively for very intermittent wireless microphone users such as electronic news gathering is a highly inefficient use of the spectrum.”<sup>23</sup> In recent ex parte presentations, PISC proposes to allow microphones not presently licensed under Part 74 to be authorized by rule under Section 307(e) of the Communications Act and obtain co-equal status with approved TVBDs.<sup>24</sup> Under this proposal, unlicensed wireless microphones would receive greater interference protection than they have today – which is none – and be subject to the geolocation access requirements applicable to TVBDs, without occupying a significant amount of white space spectrum in urban areas.

After considering PISC’s recent submissions, WISPA believes that a combination of proposals strikes the appropriate balance for all stakeholders. First, licensed legal wireless microphones would be registered in the database and enjoy interference protection within a one-kilometer circle around the designated coordinates.<sup>25</sup> Second, in each market, two channels (12 MHz) would be designated for *non-exclusive* use by unlicensed wireless microphones. Unlicensed wireless microphones would be required to register in the geolocation database and access the database on the same terms as TVBDs.

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<sup>21</sup> See WISPA Petition at 6; Motorola Petition at 10.

<sup>22</sup> WISPA Petition at 6.

<sup>23</sup> PISC Petition at 18.

<sup>24</sup> See, e.g., PISC Notice of Ex Parte Presentation, WT Docket Nos. 08-166 and 08-167 and ET Docket No. 04-186, filed Apr. 17, 2009.

<sup>25</sup> See Part I.B., *supra*, opposing efforts to expand this zone.

and would have co-equal, secondary status with TVBDs.<sup>26</sup> Fixed TVBDs also would be permitted to operate in these channels on a co-equal and non-exclusive basis. Although WISPs and other TVBDs likely would seek to avoid operating on the designated spectrum, in congested or spectrum-scarce areas they would be permitted to share the two channels with wireless microphones.

This solution accomplishes several objectives – it legitimizes unlicensed wireless microphones by affording them co-equal status with unlicensed TVBDs, mitigates the potential for interference by designating specific channels for wireless microphones and requiring wireless microphones to register and access the geolocation database, and allows TVBDs to also use the designated spectrum on a *non-exclusive* basis with a higher degree of certainty that they will not suffer interference from unauthorized wireless microphones. Because the two designated channels are not exclusive to wireless microphones, they would not preclude use by WISPs and thus provide an efficient way to manage white space spectrum use, even in urban areas. WISPA urges the Commission to adopt this proposal as a cost-effective, practical and balanced approach to accommodating the interests of TVBDs, licensed wireless microphone users and unlicensed wireless microphone users.

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<sup>26</sup> WISPA notes that Section 307(e) designates specific radio services for which blanket authority is available (e.g., citizens band, radio control, certain aviation radio and certain maritime radio). Accordingly, the Commission may lack authority to implement Section 307(e) authority for wireless microphones that are not able to be licensed under Part 74. If the Commission has such authority, WISPA would have no objection to the Commission's use of Section 307(e) to afford operational authority to wireless microphones.

## II. THE COMMISSION SHOULD RELAX ITS ANTENNA AND BASE STATION HEIGHT RESTRICTIONS.

Motorola and IEEE 802 agreed with WISPA that the Commission should eliminate the 10-meter height minimum for fixed TVBD receive antennas, as specified in Section 15.709(b)(2). WISPA advocated a three-meter minimum, stating that the Commission failed to consider the substantial additional costs to install fixed TVBD antennas at a minimum of 10 meters above ground. Likewise, Motorola proposed a three-meter minimum height to ensure that “deployment of fixed receive antennas will be economically viable and compliant with most local restrictions on the installation of over-the-air receiving devices.”<sup>27</sup> WISPA estimated that compliance with the 10-meter minimum would add \$400 to the cost of each installation.<sup>28</sup> Motorola pegged the cost at between \$100 for the “best case” and \$1500 if a tower is required.<sup>29</sup> Convinced that the geolocation database alone will provide incumbent television stations with adequate protection, IEEE 802 departed from its earlier position<sup>30</sup> in 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.”<sup>31</sup>

WISPA, Motorola and IEEE 802 also asked the Commission to remove the 30-meter limit on the height of base station antennas. As a primary reason for increasing the maximum height, WISPA and Motorola both observed that installing transmitters at higher elevations results in fewer towers and more economical deployments, necessary

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<sup>27</sup> Motorola Petition at 8.

<sup>28</sup> See WISPA Petition at 8.

<sup>29</sup> See Motorola Petition at 7.

<sup>30</sup> See IEEE 802 18 Comments at 11-12.

<sup>31</sup> IEEE 802 Petition at 3. IEEE 802 correctly noted that the 10-meter minimum height “was driven by TV sensing,” not wireless microphone sensing. *Id.* at 3, n.5.

ingredients to serving rural and sparsely populated areas.<sup>32</sup> As Motorola stated, increasing the height from 30 meters to 100 meters increases the coverage area by approximately 350 percent such that for every 3.5 base stations installed at a 30-meter height, only one would be required at 100 meters.<sup>33</sup>

IEEE 802 urged the Commission to not limit the height of fixed base stations and to measure base station height according to height above average terrain (“HAAT”) instead of height above ground (“AGL”).<sup>34</sup> WISPA certainly agrees that limiting base station elevation “would unnecessarily limit fixed base station coverage,”<sup>35</sup> but believes that AGL would be much less complicated to determine and would eliminate the complexities of measuring HAAT at every subscriber’s location. Given the ease at which AGL can be determined, WISPA prefers the AGL metric, but does not oppose IEEE 802’s proposal if the Commission feels it is necessary in order to allow increased base station height.

As the record makes clear, there is no good reason to maintain the 10-meter minimum height for fixed TVBD receive antennas or the 30-meter maximum height for transmitting antennas. Section 15.709(b)(2) should be amended to eliminate these unnecessary requirements that would, if retained, impose substantial additional costs and regulatory burdens on fixed TVBD operators.

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<sup>32</sup> See Motorola Petition at 4.

<sup>33</sup> *Id.* at 4-5.

<sup>34</sup> See IEEE 802 Petition at 3-4.

<sup>35</sup> *Id.* at 3.

### **III. THE COMMISSION SHOULD INCREASE POWER LIMITS FOR FIXED WHITE SPACE USE.**

WISPA asked the Commission to reconsider its 4 Watt EIRP power limit for fixed TVBDs and authorize up to 20 watts of transmitter power in uncongested rural areas so long as interference protection standards were maintained at the TV station contour.<sup>36</sup> WISPA pointed out that raising the maximum power limit would enable WISPs to cover a larger area with fewer transmit sites, and thus reduce site acquisition and infrastructure costs. WISPA added that increased power would facilitate point-to-point interconnection of rural networks, without increasing the potential for interference to protected stations.<sup>37</sup>

Taking a slightly different approach, PISC proposed a plan that would allow operation of fixed TVBDs at higher power where there would be a sufficient “buffer” of 18-24 MHz between the WISP service and the protected service.<sup>38</sup> Although based on maintaining a guard band of spectrum rather than distance separation criteria, PISC and WISPA essentially make the same point – a unitary power limit of 4 Watts EIRP will unnecessarily preclude WISP operations where there is no threat of interference to incumbents. WISPA believes its proposal will better serve the public interest because it can accommodate more users than the proposal advanced by PISC. For example, if a WISP were to operate at high power on a channel 18 MHz from an occupied TV channel, under PISC’s plan WISPs deploying on adjacent channels would have to operate at lower power. Under WISPA’s proposal, all WISPs would operate under the same standards

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<sup>36</sup> See WISPA Petition at 15-16.

<sup>37</sup> See *id.* at 16.

<sup>38</sup> See PISC Petition at 10-11.

that would not favor the one that deploys in the spectrum furthest from protected contours (*i.e.*, the first to deploy). WISPs also would have greater flexibility in channel selection and could consider such factors as the size of the market, equipment costs and tower site availability.

WISPA believes its approach also is superior to the proposal advanced by FiberTower and others to dedicate or reserve up to six channels (36 MHz) of white space for fixed, licensed uses such as backhaul and “middle mile” connectivity.<sup>39</sup> Although WISPA agrees that affordable access to the Internet backbone is lacking in rural areas, WISPA believes that setting aside up to 36 MHz of spectrum in a given area is an inefficient use of TV white space. Instead, point-to-point backhaul and connectivity services can be implemented in the TV white spaces under WISPA’s proposal to allow up to 20 watts transmitter power. By requiring fixed TVBD operators to examine the geolocation database and design non-interfering facilities – a key element of WISPA’s “licensed-lite” proposal<sup>40</sup> – point-to-point uses and WISP deployments can operate in harmony without interference and without wasting spectrum.

#### **IV. THE COMMISSION SHOULD REJECT PROPOSALS THAT WOULD IMPOSE NEW DISTANCE AND POWER RESTRICTIONS ON FIXED TVBDs.**

WISPA strongly opposes NCTA’s proposal to impose distance and power limitations on fixed TVBD deployment because it is based on testing parameters that are

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<sup>39</sup> See Petition for Reconsideration of FiberTower Corporation, *et al.*, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009, at 1-2.

<sup>40</sup> See WISPA Petition at 16-17. In its *ex parte* presentations and the WISPA Petition, WISPA urged the Commission to adopt rules similar to those used in the 3650 MHz Service, which states that “[l]icensees should examine this database before seeking station authorization, and make every effort to ensure that their fixed and base stations operate at a location, and with technical parameters, that will minimize the potential to cause and receive interference.” *Id.* at 17, quoting *Wireless Operations in the 3650-3700 MHz Band*, 20 FCC Rcd 6502, 6512-13 (2005).

inherently flawed to overstate the incidence and degree of potential interference to TV sets. NCTA's test results purport to show that fixed white space transmitters could cause interference to TV sets up to 1,000 feet away such that the Commission should require separation of 400 feet between a fixed TVBD transmitter operating at 4 Watts EIRP and buildings served by cable systems.<sup>41</sup> NCTA also proposes a power limit of 1 Watt EIRP in urban areas where it may be difficult to maintain separation.<sup>42</sup> As the following illustrates, NCTA's conclusions about fixed wireless are invalid:

**A. NCTA's Indoor Test Results Are Flawed.**

NCTA's indoor testing procedures, as explained in the Carl T. Jones Corporation reports appended to the NCTA Petition (collectively, the "CTJ Report"),<sup>43</sup> contain a number of flaws that skew and overstate the potential for interference to TV sets receiving cable service.

**1. Inadequate "Indoor Test Range"** - The "indoor test range" used in the Carl T. Jones (CTJ) testing was a conference room located within a Cox Cable "maintenance facility,"<sup>44</sup> not a properly shielded RF test range. The room had at least one external wall with a window, and sunlight is visible streaming in through that window in Figure 4 of the CTJ Report.<sup>45</sup> The unshielded conditions of this "test range" made the test setup, the test television receivers, the coaxial connecting cables and the AC power cables vulnerable to interference from all manner of external RF interference including off-the-air television signals. The test setup was also vulnerable to ambient noise pickup from within the cable television facility itself. Consequently, the source and the extent of any possible interference from simulated TVBDs cannot be accurately or credibly determined.

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<sup>41</sup> See NCTA Petition at 13.

<sup>42</sup> See *id.*

<sup>43</sup> The CTJ Report consists of Appendices I, II, III and IV to the testing analysis performed by David Large (separately referred to as the "Large Report"). The Large Report and the CTJ Report comprise the Attachment to the NCTA Petition.

<sup>44</sup> CTJ Report, Appendix II at 2.

<sup>45</sup> *Id.* at 5

**2. Inaccurate Noise-Floor Characterization** - The lack of complete noise floor testing within the “indoor test range” invalidates CTJ’s claim that its efforts to verify “the absence of any strong spurious or other unidentified emissions in the frequency range under test” were successful.<sup>46</sup> Efforts clearly were not sufficient to adequately identify and correct for the presence of pre-existing noise on the television frequencies under test. In addition, no noise-floor testing was performed on frequencies other than the television channels being tested, thus ignoring possible receiver overloading test artifacts. Further, no noise floor testing was performed over time, thus ignoring possible test artifacts caused by intermittent noise sources. There also is no indication that the test antenna was rotated to detect noise coming from directions other than the direction of the simulated white space device log periodic transmit antenna. No AC line filtering was used on the test television receivers to remove conducted noise generated by equipment within the cable television maintenance facility itself. No bandpass filtering was used on the cable that delivered the test signal to the television receivers under test. Bandpass filtering would have eliminated overloading and test artifacts resulting from noise or other overly strong adjacent-channel signals delivered to the television receivers along with the desired-channel television test signal. Because of the insufficient shielding of the room as well as the lack of both AC line filtering and cable-TV input filtering, pre-existing RF noise and AC power line noise is likely to have impacted the testing and distorted the test results.

**3. Leaky Test Cables** – The original test cables were so leaky that they forced the testing to be repeated at a later date using higher-quality quad-shielded test cables.<sup>47</sup> Even during the later test sessions that used new quad-shielded test cables, additional cable placement techniques, ground-plane shielding measures and ferrite-bead protection measures were required to reduce the purported direct pickup (DPU) interference supposedly caused by the simulated white space device test transmitter.<sup>48</sup>

The test report claims that the simulated white space transmitter and only the simulated white space transmitter caused all of the observed television receiver interference. Based on the foregoing analysis, this conclusion can clearly not be substantiated.

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<sup>46</sup> *Id.* at 4. Note that Appendix II provides no reference value for the level of claimed interference.

<sup>47</sup> *See, e.g.*, Large Report at 11.

<sup>48</sup> *See* CTJ Report, Appendix III, at 2.

## **B. NCTA's Indoor-to-Outdoor Extrapolation Is Flawed.**

Even if NCTA's indoor test results are valid (and they are not), NCTA's extrapolation of those test results to outdoor fixed wireless scenarios is further flawed by reliance on invalid assumptions.

**1. Outdoor TVBD Antenna Aiming** – NCTA implies that outdoor fixed TVBD antennas will be aimed at buildings;<sup>49</sup> however, this is not realistic. It is far more likely that outdoor TVBDs will be CPE devices aimed at distant base stations and therefore aimed away from any buildings that might obstruct the signal path and attenuate the signals.

**2. Wall Attenuation** – NCTA's test results are premised on the worst-case assumption of only 5 dB of exterior wall attenuation, which NCTA states is common in single-framed exterior walls that, it asserts, are common in western states.<sup>50</sup> Alas, the record is incomplete with regard to wall attenuation. NCTA would have made a more credible case if it had acknowledged that the majority of exterior walls likely exceed 5 dB of attenuation.

**3. Non-acceptance of Responsibility** – NCTA's specious claim that fixed outdoor TVBDs could cause direct pickup interference on indoor cable-connected TV receivers diverts attention from the more plausible occurrence of leakage from and pickup of interference by leaky outdoor aerial cable-TV plant cabling. In its Petition, NCTA implicitly acknowledges the vulnerability of outdoor "cable television drop cables [that] are installed aerially and often routed on the exterior of buildings."<sup>51</sup> Rather than accept responsibility for leaky or defective aerially-mounted cable-TV plant and drop cables, NCTA instead claims that stricter rules for TVBDs should solve the cable industry's self-inflicted interference problems.

In applying its flawed indoor testing procedures to outdoor environments, NCTA further reduces the already questionable credibility of its test results. NCTA's proposals should not be considered, and certainly cannot form any plausible basis for imposing further restrictions on fixed TVBD deployment.

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<sup>49</sup> See Large Report at 1.

<sup>50</sup> See *id.*

<sup>51</sup> See *id.* at 9. See also NCTA Petition at 13.

**C. NCTA Misunderstands How Fixed TVBD Antennas Will Be Installed.**

NCTA asserts that the Commission's rules contain no "prohibition against indoor installation" of fixed white spaces transmitters and that therefore they could be "mounted in interior hallways of apartment buildings and use maximum power to reach as many units as possible."<sup>52</sup> Although this is theoretically true given that the specific language in Section 15.709(b)(2) requires only that receive antennas be located outdoors, it would be highly unusual for a TVBD operator to install a transmitter indoors and a receive antenna outdoors. To the extent the rule does not reflect the Commission's intent that both fixed TVBD transmitter and receive antennas be located outdoors, WISPA has no objection to clarifying Section 15.709(b)(2) to so state.

In sum, NCTA's arguments and conclusions about potential interference from fixed white space devices are vastly overstated and fatally flawed. The Commission should disregard NCTA's request to reduce outdoor fixed wireless transmitter power or to impose burdensome and unwarranted fixed wireless separation requirements.

**D. The Commission Should Reject NCTA's Proposal To Require TVBDs To Coordinate With Cable Operators.**

WISPA also opposes NCTA's efforts to require fixed TVBD operators to coordinate with all cable headend operators within 100 kilometers of the fixed TVBD and to measure the signal for interference.<sup>53</sup> Under this plan, cable operators could hold up deployment of fixed services indefinitely as tests are scheduled for each headend, testing equipment is selected and brought to the field and other roadblocks established to interpose delay. The Commission has not adopted this process for any other licensed

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<sup>52</sup> *Id.*

<sup>53</sup> See NCTA Petition at 17.

service, including incumbent TV stations, instead relying on distance separation, power limits and interference protection standards to ensure that consumers are not denied access to primary services. So long as cable headends are registered in the database, TVBD operators will be obligated to consider them.

**V. THE COMMISSION SHOULD AMEND SECTION 15.711(f) TO PERMIT FIXED BASE STATIONS TO HAVE MULTIPLE FIXED CLIENT DEVICES.**

WISPA agrees with IEEE 802 that the Commission should permit fixed TVBDs to operate as clients to other fixed TVBDs.<sup>54</sup> According to IEEE 802, fixed CPE under the IEEE 802.22 protocol will operate under the control of a base station that will query the database on behalf of CPE requesting a list of available channels that the CPE can use. In order to associate with the base station, the CPE must obtain the available channel list and permission to operate from the base station. Unless amended, Section 15.711(f) would prevent this coordination and require each CPE to directly query the database. Because this would be inconsistent with IEEE 802.22 protocols and create unnecessary query requirements by the CPE, the Commission should delete the last sentence of Section 15.711(f).

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<sup>54</sup> See IEEE 802 Petition at 2-3. See also PISC Petition at 26.

## Conclusion

WISPA urges the Commission to eliminate spectrum sensing requirements, remove base station and receive antenna height restrictions and increase the maximum power at which fixed TVBDs can operate. Proposals to increase the sensing burdens and impose additional limitations on fixed TVBD operations should be rejected. The existing sensing and other operational restrictions, as well as those proposed by Shure and NCTA, will discourage broadband investment in rural, unserved and underserved areas, and making those barriers even more stringent will only hasten and make certain that fate.

Respectfully submitted.

### **THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION**

May 8, 2009

By: */s/ Richard Harnish, President*  
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**CERTIFICATE OF SERVICE**

I, Kenn Wolin, a paralegal at the law firm of Rini Coran, PC, hereby certify that I have caused copies of the foregoing "Consolidated Opposition to Petitions for Reconsideration" to be submitted to the Commission in Docket Nos. 04-186 and 02-380 via ECFS and sent by first class mail, postage prepaid (except as noted), this 8<sup>th</sup> day of May, 2009, to:

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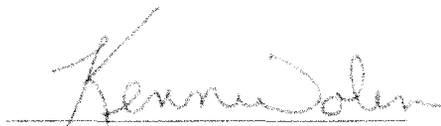
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