

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

In the Matter of)
)
Amendment of Part 15 of the Commission’s Rules) ET Docket No. 16-56
For Unlicensed White Space Devices) RM-11745

To: The Commission

COMMENTS OF THE WIRELESS INTERNET SERVICE PROVIDERS ASSOCIATION

The Wireless Internet Service Providers Association (“WISPA”), pursuant to Sections 1.415 and 1.419 of the Commission’s Rules, hereby comments on certain of the proposals advanced and questions asked in the Notice of Proposed Rulemaking (“*NPRM*”) in the above-captioned proceeding.¹ WISPA shares the Commission’s goals of enhancing the accuracy and integrity of the TV white space (“TVWS”) database system, but believes that location accuracy and deployment flexibility can only be optimized by preserving professional installation. In particular, professional installation is required to responsibly input and verify vertical height information and intermediate power levels, thereby ensuring that TV broadcast stations are better protected from interference and enabling more efficient use of white space spectrum. Contrary to some of the proposals in the *NPRM*, better alternatives exist for the purpose of eliminating database errors.

WISPA’s Interest in This Proceeding

WISPA is the trade association representing the interests of the fixed wireless broadband industry. WISPA has more than 800 members, most of which are wireless Internet service providers (“WISPs”) that provide fixed wireless broadband service to consumers and businesses in rural areas. Overall, WISPA estimates that more than 3,000 WISPs provide broadband access to

¹ See *Amendment of Part 15 of the Commission’s Rules for Unlicensed White Space Devices*, FCC 16-23 (rel. Feb. 26, 2016) (“*NPRM*”).

more than 3,000,000 people in residences, businesses, hospitals, public safety locations and educational facilities. In many rural areas of the country, WISPs provide the only terrestrial broadband service because the cost to extend cable, DSL and fiber cannot be justified in areas with low population density. In many urban and suburban markets, WISPs provide a local access alternative that fosters competition in service, cost and features. In addition to using unlicensed spectrum in the 900 MHz, 2.4 GHz, and 5 GHz bands and “lightly licensed” spectrum in the 3650-3700 MHz band, WISPs are among the first service providers to make use of unlicensed TVWS spectrum, which offers significant advantages over the other unlicensed bands because it is not congested and has propagation characteristics that enable WISPs to reduce their infrastructure costs. WISPA’s objective in this proceeding is to ensure that WISPs and other fixed wireless spectrum users will retain the ability to make spectrally efficient use of the available TVWS spectrum.

Discussion

1. The Commission Should Not Eliminate the Professional Installation Option.

In an effort “to improve the accuracy of the geo-location data provided to the databases” and ensure “the integrity of and confidence in the system,” the Commission proposes in the *NPRM* to amend Section 15.711(c) to eliminate the option of professional installation for fixed white space devices, “thereby eliminating the possibility that manual data entry could cause incorrect location data to be stored in the white space device or provided to the database.”² If adopted, the effect of this proposal is that every white space device will be required to have geo-location capability to determine, store and transmit the geographic location of the device. The *NPRM* states plainly that the Commission is “not aware of any interference from operation of fixed white space test devices

² *Id.* at 7 (¶ 20).

at a location different from the test location where the device is registered.”³ This admission and the limited evidence in the *NPRM* offer, at best, an extremely thin factual pretext for the complete elimination of professional installation as means of implementing unlicensed fixed wireless service using the TVWS database, and ignores compelling evidence of the need for professional installation to ensure database accuracy.

The proposal to eliminate professional installation paints with too broad a brush, and would unnecessarily and unwisely eliminate the potential for information provided by professional installers to enhance the utility and accuracy of the database approach to achieve the most spectrum-efficient operating environment for all spectrum users. No system of controlled spectrum access is immune to occasional data input errors, and the Commission should not reject out-of-hand the potential for properly trained and appropriately incentivized professional installers to augment automatic data gathering mechanisms in an accurate and useful manner that will serve to promote the overall integrity and reliability of the database system.⁴

Critical and necessary operating parameters require some human reporting in order to maximize accuracy. As the Commission correctly acknowledges in the *NPRM*, “the vertical height accuracy of GPS is typically less than the horizontal accuracy,” such that automatic entry of GPS vertical height may limit the identification available channels and compromise the protection provided to broadcasters.⁵ Indeed, the accuracy of GPS vertical height information varies substantially, particularly where low-cost GPS receivers are employed, as is likely to be the case

³ *Id.* at 5-6 (¶ 15).

⁴ *See, e.g.*, Opposition and Reply of CTIA[®] to Petitions for Reconsideration, ET Docket No. 14-165, GN Docket Nos. 14-166 & 12-268 (filed Feb. 29, 2016) at 10 (“the Commission should make every effort to ensure the quality and accuracy of data in the white space device databases”).

⁵ *See NPRM* at 8 (¶ 21).

with respect to TVWS equipment such that reliance on the data generated by the device alone to establish its location in the vertical plane is likely to degrade the capability of the TVWS database to protect TV stations and to provide an optimized list of available channels. As WISPA stated in an *ex parte* letter in this proceeding:

Vertical height errors from GPS can range from 30 feet to several hundred feet, while vertical height entered by a human, professional installer will be accurate within one or two feet. This limitation inherent in GPS vertical positional accuracy reduces the accuracy of white space antenna coverage prediction and the licensed incumbent's protection zone, and thereby distorts the database-provided list of available white space channels.⁶

In other words, if the automatically-generated antenna height information shows a TVWS broadband device ("TVBD") to be at a higher height above ground than it actually is, it would preclude entirely the opportunity of the user to transmit even if there is actually spectrum available for use. Conversely, if the TVBD is positioned above an automatically determined height, the database could make an interfering channel available for unlicensed use. To address both cases of inherent database inaccuracy, the Commission should permit professional installers to manually enter a device's height above ground because such data entry will provide more accurate information than height information automatically generated by an internal GPS receiver.⁷

Finally, and perhaps most significantly, the Commission's assumption that all TVBDs include self-contained antennas is incorrect. At white space frequencies, TVBD antenna size is

⁶ Letter from Stephen E. Coran, Counsel to WISPA, to Marlene H. Dortch, FCC Secretary, ET Docket No. 14-165 & GN Docket Nos. 12-268 and 12-354 (filed Jan. 21, 2016) at 2.

⁷ See *NPRM* at 8 (¶ 21). The Commission asks "whether we should allow *users* (including professional installers and operators) to override an automatically determined height if it proves to be inaccurate, or whether we should "simply allow *users* to manually enter the height above ground in all cases." *Id.* (emphasis added). WISPA believes that professional installers, not users, should be responsible in all cases for manually entering height information in the database.

relatively large; therefore, many if not most TVBDs are “connectorized” (*i.e.*, designed for use with external antennas). In other words, most TVBDs do not include self-contained internal antennas; therefore, the mounting height of most TVBDs will be substantially different than the actual mounting height of their antennas. For ease of installation and maintenance, most TVBDs will be mounted at or near ground level while their antennas will be mounted far above ground. This reality calls into question the Commission’s thesis that a GPS receiver contained within a TVBD can accurately determine the TVBD antenna height. It is clear that entry of accurate antenna height information into the TVWS database requires human intervention, preferably by a professional installer, to meet the Commission’s goal of enhancing the accuracy and integrity of the TVWS database system.

WISPA agrees with the Commission’s proposal to require TVBDs to obtain their geographic coordinates from a secure, connected external source if the device cannot determine its geographic location.⁸ WISPA further concurs that manufacturers should have flexibility in how they provide the connection between the fixed white space device and the external geolocation source because the conditions may differ based on the location of the device. In some locations, a secure wireless connection may be sufficient, whereas other cases may require a wired connection. WISPA further agrees that accuracy within 100 meters would be sufficient.⁹

Although not addressed in the *NPRM*, the EIRP of the TVBD antenna is another parameter that requires data entry by a professional installer. The Commission recently amended Section

⁸ *See id.* at 9 (¶ 23).

⁹ *See id.* at 9-10 (¶ 24).

15.712(b) to permit unlicensed operation at various power levels below the maximum EIRP.¹⁰ In adopting this rule, the Commission required the database to provide the maximum power level for each available channel.¹¹ While there may be no need for the database to know whether the TVWS user is operating at less power than the database allows, it is necessary for the database to know which available channel is selected for use when multiple channels are available. For instance, if the database returns a list of five available channels, the database must know which one will be used. A human, preferably a professional installer at the location, is in the best position to select the channel and set the device to report that channel to the database.

Instead of eliminating the professional installation option, the Commission can and should make improvements to ensure greater accuracy. First, the Commission should adopt its proposal to require database administrators to confirm the e-mail address and telephone number of the contact person – in WISPA’s view, that person is the professional installer.¹² This check in the system will create greater accountability with the installer and increase the accuracy of the database. Second, as the Commission is aware, WISPA is working both with its own member companies and with the Wireless Innovation Forum to develop a formal professional installer certification program that would further minimize the potential for database errors arising from manual data input.¹³ As the Commission recently noted, “industry-led professional accreditation processes have been used by

¹⁰ See *Amendment of Part 15 of the Commission’s Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, et al.*, Report and Order, FCC 15-99, ET Docket No. 14-165 & GN Docket No. 12-268 (rel. Aug. 11, 2015).

¹¹ See *id.* at 20.

¹² See *NPRM* at 14 (¶ 38).

¹³ WISPA’s Reply to Opposition to Petitions for Reconsideration, ET Docket No. 14-165 & GN Docket No. 12-268, at 5-6 (filed March 10, 2016).

the Commission and have, in fact, proven successful” in a variety of contexts.¹⁴ Such a program would require each certified installer to disclose his or her identity and contact information, and to certify affirmatively that the installation parameters entered into the database are accurate. In the event of an error or violation, the Commission would have the ability to take enforcement action not only against the operator but also against the professional installer, including possible debarment of any installer who proves to be inaccurate. These protections will significantly increase the accuracy of the TVWS database compared to the option of reducing database accuracy by eliminating professional installation.

At a minimum, the professional installation option must be preserved for the limited circumstances described above – to report actual antenna height above ground, to correctly install devices that are blocked from GPS access and require an external “outdoor” antenna, to report the EIRP of the device for the channel selected, and to ensure that the device reports the operating channel when there are multiple vacant channels available. Simply put, there are no reasonable alternatives to human intervention in these cases where accurate information cannot be automatically communicated by the device to the database.

2. At a Minimum, The Commission Should Allow White Space Device Operation at Greater Height Above Average Terrain.

In arguing in favor of an automatic-geo-location-only regime for TVBDs in its July 17, 2015 letter filed jointly with several device manufacturers, the National Association of Broadcasters (“NAB”) also affirmatively agreed to support “proposed rule changes that permit such TV band device[s] to operate at higher power levels *and increased height above average terrain (HAAT)*”

¹⁴ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, GN Docket No. 12-354, FCC 16-55, at 36 (¶ 126) (rel. May 2, 2016).

with the proviso that the same level of interference protection is afforded to broadcast stations as under the current rules (*i.e.*, through adequate distance separations).¹⁵ This enhancement was effectively offered as a *quid pro quo* for other changes sought by NAB, particularly the proposed abandonment of the professional installer option for providing the geographic location of devices registered in the TVWS database.

Given this agreement, to the extent that the Commission eliminates or curtails the availability of the professional installer option for registration of geographic coordinates in the TVWS database, the Commission should also adopt these companion rule changes to permit TV band devices to operate at higher power levels and an increased HAAT of 500 meters.¹⁶ Allowing increased antenna height for TVBDs that employ automatic geo-location capability, appropriately augmented by additional installer-provided antenna height data and with appropriate changes to the distance separation table, will enhance spectrum utilization and improve fixed wireless broadband service to underserved rural consumers.

Conclusion

For the foregoing reasons, WISPA urges the Commission to consider carefully how best to achieve its goals of enhanced TVWS database accuracy and integrity. WISPA believes that optimizing these goals requires utilization of both automatic geo-location capability and the skills of professional installers. While the Commission should encourage the development of automatic device reporting capabilities, it should also continue to rely on the professional training of certified

¹⁵ Letter from Haiyun Tang, Adaptrum, Inc.; James Carlson, Carlson Wireless Technologies, Inc.; Larry W. Koos, Koos Technical Services, Inc.; Jordan Du Val, MELD Technology, Inc.; and Rick Kaplan, NAB, to Julius P. Knapp, Chief, Office of Engineering and Technology, RM-11745 (filed July 17, 2015) at 2 (emphasis added).

¹⁶ See Comments of WISPA, ET Docket No. 14-165 & GN Docket No. 12-268 (filed Feb. 4, 2015) at 14-15; WISPA Petition for Reconsideration, ET Docket No. 14-165 & GN Docket No. 12-268 (filed Dec. 23, 2016) at 6-7.

installers to determine the most relevant and accurate data to be reported for each device, including antenna height and EIRP characteristics. Finally, regardless of other steps taken in this docket, the Commission should authorize TVBD operations from higher antenna heights above average terrain, with appropriate adjustments in distance separation criteria to avoid harmful interference.

Respectfully submitted,

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