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

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, and	)	ET Docket No. 14-165
Amendment of Part 74 of the Commission's Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap	)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions	)	GN Docket No. 12-268

REPLY TO OPPOSITIONS TO PETITION FOR RECONSIDERATION OF THE NATIONAL ASSOCIATION OF BROADCASTERS

I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)[1] hereby replies to oppositions submitted by the Wireless Internet Service Providers Association (WISPA), Google Inc., and Microsoft Corporation in the above-captioned proceeding, opposing NAB's petition for reconsideration regarding of the Commission's recent order modifying its rules for unlicensed white space device operation in the television bands.[2]

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[1] The National Association of Broadcasters is a nonprofit trade association that advocates on behalf of free local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

[2] *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;*

All of the changes NAB seeks in its petition for reconsideration are directed towards a simple, and achievable goal: ensuring that unlicensed operations in the television band do not cause harmful interference to licensed services. NAB sought limited changes to the FCC's rules because certain of those rules unnecessarily and unacceptably raise the potential for harmful interference to over-the-air television viewers and other licensed operations.

Unfortunately, the parties opposing NAB's petition for reconsideration have a different goal: expanding unlicensed operations in the television band at any cost. To these parties, the risk of harmful interference to licensed operation is simply irrelevant, because the as yet unrealized benefits of TV white spaces (TVWS) operations are allegedly so significant that they merit increased risks. Setting aside the indisputable fact that TVWS devices have utterly failed to deliver on the grand promises many of these same parties have made to the Commission previously, that is simply not how the Commission's unlicensed rules work. Instead of brushing licensed services aside because it is convenient, and cheaper than seeking access to licensed spectrum, unlicensed operations in the television band must remain at their core opportunistic in nature and must take place in between and around licensed services without causing interference.

Amendment of Part 74 of the Commission's Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and 600 MHz Duplex Gap; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, 30 FCC Rcd 9551 (2015) (Report and Order).

II. MORE FREQUENT COMMUNICATIONS BETWEEN DEVICES AND THE DATABASE WILL NOT MATERIALLY DRIVE UP COSTS OR IMPACT BATTERY LIFE

In their oppositions, Google and Microsoft continue to assert that the Commission should designate only a limited number of channels as "fast-polling" channels, on which TVWS devices would be required to check the database every 20 minutes for updated availability information. Google and Microsoft insist that requiring TVWS devices to poll the database for updated channel availability on all channels every 20 minutes would be burdensome, because it would greatly increase the costs of operating a TVWS database and would reduce the battery life of portable TVWS devices.[3] These assertions remain as unfounded as they were when NAB addressed them in its Petition for Reconsideration.

TVWS registration information in the database represents approximately 139 kilobytes of data. It strains credulity to suggest that a TVWS database operator, such as Google, which provides over 900 million free Gmail accounts, is unduly burdened by a requirement that would entail sending even the entire database in a 139 KB message to roughly 600 devices nationwide every 20 minutes, let alone an even shorter message indicating "no change" or that a particular channel was no longer available. Indeed, given that a robust, reliable database is the cornerstone of the Commission's chosen mechanism for protecting licensed services from harmful interference caused by TVWS devices, Google and Microsoft's argument would naturally raise concern that current database operators are unqualified for the oft-predicted, but not yet observed, proliferation of TVWS technology.

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[3] Google Inc. Opposition to Petitions for Reconsideration, ET Docket No. 14-165, GN Docket No. 12-268, 13-14 (Feb. 29, 2016) (Google Opposition); Response and Opposition to Petitions for Reconsideration of Microsoft Corporation, ET Docket No. 14-165, GN Docket No. 12-268, 16 (Feb. 29, 2016)

Google and Microsoft's assertions regarding battery life are no more credible. First, at this time, there are no battery-powered TVWS devices authorized by the Commission. Second, because there will likely be significantly fewer vacant channels available in most locations, applying the polling requirement to all channels after the auction will be much more manageable for the TVWS database than it would be today. Third, if future portable TVWS devices are overwhelmed by exchanging few IP packets every 20 minutes, what uses will they realistically be able to accommodate?

III. NO VALID TECHNICAL ANALYSIS SUPPORTS THE OPERATION OF LOW POWER FIXED TVWS DEVICES ON ADJACENT CHANNELS WITHIN A TV STATION'S PROTECTED CONTOUR

In their oppositions to NAB's petition for reconsideration, Google and Microsoft contend that the Commission correctly concluded that low power fixed unlicensed devices can operate on adjacent channels within the protected contour of a TV station without causing harmful interference.[4] However, Google and Microsoft fail to seriously address NAB's technical arguments, and appear to contradict their own arguments.

First, NAB's petition for reconsideration relied on exactly the same analysis the Commission itself used in developing the existing TVWS rules. The Commission's original interference analyses for TVWS personal/portable and fixed devices were based on substantially different technical assumptions for these devices. In its original decision, the Commission assumed personal/portable devices would be used close to the ground, thus below of the main beam of a TV receive antenna and subject to ground attenuation, and close to a user's body, thus subject to body absorption losses.[5] The Commission also

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[4] Google Opposition at 15-16; Microsoft Opposition at 23-25.

[5] *Unlicensed Operation in the TV Broadcast Bands*, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807, ¶¶ 172-178 (2008) (TVWS Second Report and Order).

reasoned that personal/portable devices would presumably be battery powered and would operate using intermittent transmissions, as compared to fixed devices that can operate continuously powered by AC electricity. These factors simply do not apply to a fixed device.

In the case of a fixed device, the Commission itself assumed a 10 meter antenna height, which would place the device squarely in the main beam of a TV receive antenna. Microsoft's only rebuttals of this point are to *assume* that most fixed TVWS devices may operate at heights below the 10 meter maximum, and to claim that the assumption that TV antennas operate at 10 meters is merely a mathematical assumption that does not "precisely represent the height of every television receive antenna in the United States."[6] Both claims are unavailing. Microsoft's assumption that most devices will operate below the maximum 10 meter height is wholly unsupported, and defies common sense. In reality, most TVWS devices will likely operate at the maximum height to maximize reception.

Microsoft's second argument – that the Commission's assumption that TV antennas operate at 10 meters is merely a mathematical assumption is absurd; of course the Commission cannot possibly "precisely represent the height of every television receive antenna in the United States."[7] In developing models for calculating potential interference, however, the Commission must make reasonable assumptions. Whether or not *every television antenna in the United States* is 10 meters high is beside the point. The Commission has assumed a 10 meter television antenna height to calculate all of the separation distances for TVWS operations, and uses the same figure in OET-69. It defies

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[6] Microsoft Opposition at 24.

[7] *Id.*

sound engineering practice to simply discard this reasonable assumption because it is inconvenient for Google and Microsoft.

Further, in discussing the potential interference TVWS devices may cause to Wireless Medical Telemetry Service (WMTS) operations, Google and Microsoft make a remarkable about face. Here, both companies claim that additional WMTS protections are unnecessary, and that comparisons between WMTS and DTV operations are inapt because of the differences between the services. Microsoft states that, "protected DTV receivers located at the outer edge of the coverage area will, by definition, receive the DTV signal only faintly and over a great distance."[8] Similarly, Google claims that DTV antennas require much greater separation distances from TVWS operations than do WMTS operations because "DTV…receivers are designed to receive relatively weaker signals over very long distances outdoors."[9] Under these circumstances, with relatively weak signals at the edge of protected contours, a more conservative analysis is warranted – and the Commission should not relax its rules to permit operations that are substantially more likely to cause harmful interference.

IV. THE PROFESSIONAL INSTALLATION REQUIREMENT REMAINS UNSUPPORTABLE

In its opposition, WISPA argues that, rather than eliminating professional installation as an option for determining a device's location, the Commission should make professional installers accountable for their actions by making them subject to enforcement sanctions. This is an unworkable, and needlessly complex, means of addressing the problems caused by so-called "professional installation."

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[8] Microsoft Opposition at 3.

[9] Google Opposition at 7.

As an initial matter, the Commission has instituted a separate proceeding to address the question of whether or not to eliminate the professional installation option. Based on the extensively documented problems professional installation has created in the TVWS database, and the joint proposal NAB submitted with TVWS device manufacturers themselves, the Commission proposes to eliminate the professional installation option and instead require devices to obtain location information from an incorporated geolocation capability or from a connection to an external source with geolocation capability.[10] It is unclear why WISPA feels it has a better grasp on how to solve this problem than the device manufacturers themselves.

With respect to WISPA's specific recommendations that the Commission apply enforcement sanctions to professional installers to improve accountability, this proposal is unworkable in practice. Ultimately, the Commission has authority over FCC licensees, parties that operate radiofrequency devices improperly or without a license, and manufacturers of devices. There is no existing basis for the Commission to exercise legal authority over installers, rendering WISPA's proposed solution ineffective.

V. CONCLUSION

In its petition for reconsideration, NAB demonstrated that a number of the Commission's modified rules lack a firm technical foundation and unacceptably raise the potential for harmful interference to licensed services. None of the oppositions to NAB's petition present serious technical arguments that undercut these concerns. Instead, the oppositions essentially ask the Commission to brush aside legitimate technical

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[10] *Amendment of Part 15 of the Commission's Rules for Unlicensed White Space Devices*, Notice of Proposed Rulemaking and Order, ET Docket No. 16-56, RM-11745, FCC 16-23, ¶ 18 (Feb. 26, 2016).

considerations in the name of advancing TVWS development and deployment. This is inconsistent with the Commission's rules and orders governing unlicensed operations and undermines a stable environment for the coexistence of licensed and unlicensed operations in the television band. The Commission should grant NAB's petition.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Susan Baurenfeind, certify that on this 10th day of March, 2016, I have caused a true and correct copy of the foregoing Reply to Oppositions to Petition for Reconsideration to be served via first class mail, postage paid, upon:

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