BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
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

To: The Commission

PETITION FOR RECONSIDERATION
OF CARLSON WIRELESS TECHNOLOGIES, INC. AND CAL.NET, INC.

Carlson Wireless Technologies, Inc. and Cal.net, Inc. ("Petitioners"), pursuant to Section 1.429 of the Commission's Rules,[1] respectfully requests reconsideration of one aspect of the *Report and Order* in this proceeding.[2] While the Petitioners commend the Commission on many of the rule amendments and decisions adopted in the *Report and Order*, which will serve to make operations in the unlicensed TV White Spaces ("TVWS") more flexible and effective in order to

[1] 47 C.F.R. § 1.429.
[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, et al.*, Report and Order, 30 FCC Rcd. 9551 (2015) ("*Report and Order*"). A summary of the *Report and Order* was published in the Federal Register on November 23, 2015, thereby establishing December 23, 2015 as the deadline for filing petitions for reconsideration. *See* 80 Fed. Reg. 73044 (Nov. 23, 2015).

bring robust broadband to unserved and underserved areas of rural America,[3] Petitioners request that the Commission reconsider its decision not to allow fixed white spaces devices ("WSDs") to operate at 4 watts EIRP within three megahertz of an occupied TV station band edge. This additional flexibility and spectral efficiency for broadband providers, will greatly enhance their ability of offer services to consumers and business in America today who are unserved or underserved.

I. Petitioners Carlson Wireless and Cal.net

Carlson Wireless is a leader in the design and production of fixed wireless equipment, including TVWS broadband equipment. In addition to research and development, Carlson Wireless has been manufacturing commercial TVWS equipment since 2012 and continues to introduce the highest performing, most cost-effective TVWS equipment on the market. Carlson Wireless has successfully deployed and demonstrated its TVWS equipment and technology in many locations in the United States and throughout the world. Carlson Wireless has worked closely with the Commission over the past seven years to ensure that the FCC's Part 15 service and technical rules advance the great promise of white spaces usage for broadband and, at the same time, ensure interference protection for licensed incumbent users of the TV bands, including TV broadcasters. Carlson Wireless' President, James Carlson, is also a long-standing and active member of the WhiteSpace Alliance, and a founding member of the Dynamic Spectrum Alliance, each of which also has made significant contributions to the Commission's proceedings establishing and refining the TVWS rules and decisions.

[3] Petitioners also fully support the requests for rule modifications set forth in the Petition for Partial Reconsideration of the Wireless Internet Service Providers Association filed today in this proceeding.

Cal.net is a rapidly growing provider of broadband Internet services to homes and businesses in unserved and underserved regions in California, using primarily fixed wireless Internet technology operating on both unlicensed and licensed spectrum. In business since 1996, with a history of exceptional service to its local community, Cal.net currently delivers Internet services to more than 3,600 customers throughout a rural service area covering nearly 1,000 square miles in western El Dorado and Amador Counties, California

Beginning in April 2013, Cal.net initiated one of the largest commercially feasible projects in the United States to deploy and test TVWS technology for the purpose of determining its efficacy for delivering quality broadband Internet services to residents and businesses situated in challenging rural locations. These homes and businesses are located in areas where no wireline broadband service exists, where cellular telephony service is spotty or nonexistent, and where line-of-sight wireless communications technologies are ineffective due to dense forests and/or rugged terrain. While limited to date, Cal.net's deployment of Carlson Wireless' TVWS equipment has definitively established TVWS as a viable means of delivering broadband service to rural subscribers who have no alternatives available (other than satellite) due to the geographic constraints of their locations. Cal.net subscribers connected via TVWS have been delighted with the results that have been achieved, enjoying broadband service in their homes and businesses for the very first time. Cal.net plans to greatly increase its use of TVWS throughout its network coverage area and to increase its coverage area with TVWS technology to serve even more people today who are unable to be served feasibly with other wireline (DSL, fiber, cable) or wireless line-of-sight technologies.

II. The Commission Should Reconsider Its Decision Not to Allow Fixed WSDs to Operate at 4 Watts EIRP with Three MHz Separation From the Licensed Spectrum of an Operating TV Station

Petitioners respectfully submit that the Commission should reconsider and reverse its decision at paragraph 37 of the *Report and Order* not to allow fixed WSDs to operate at power levels to 4 watts EIRP within a separation distance of three MHz (not six MHz) of an occupied broadcast TV channel. As explained below, this decision failed to address all relevant technical considerations and undermined the Commission's overarching public interest objective to adopt TVWS rules that permit more robust and efficient use of the vacant TV band spectrum without the risk of harmful interference to incumbent licensees of the TV bands, including TV broadcasters.

Significantly, the Commission's 2014 *NPRM* had proposed to adopt rules permitting TVWS fixed devices to operate at up to 4 watts EIRP with a three MHz separation from operating TV broadcasters, "because such [TVWS] operation will increase spectrum efficiency and we believe, based on several studies, that operating in this manner will not increase the potential of interference to television reception."[4] Under existing rules, TV stations entitled to interference protection have a full six megahertz of adjacent-channel protection both above and below their operating channel. This means that there must be at least three contiguous vacant channels (18 MHz) available for just the middle channel – six megahertz – to be used for fixed WSD operations at a maximum power of four watts EIRP.[5] In the *NPRM*, the Commission proposed to relax this rule by allowing fixed devices to operate where there are only two

[4] *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.*, Notice of Proposed Rulemaking, 29 FCC Rcd. 12248, para. 37 (2014) ("*NPRM*").

[5] 47 C.F.R. § 15.712.

contiguous vacant channels, which would reduce the spectral distance to the TV station band edge from six MHz to three MHz. Thus, as proposed in the *NPRM*, a full-power (4 watt EIRP) six MHz TVWS channel could occupy the mid-span of two adjacent vacant TV channels with three MHz of separation to the next adjacent channels without affecting TV reception on those outer channels.[6] One study cited by the *NPRM* (at n. 59) was prepared by Carlson Wireless and Google based on their joint TVWS trial project in Cape Town, South Africa, where WSDs operated immediately adjacent to operating TV broadcast stations (*i.e.*, 0 MHz separation) – and no instances of interference of the TV broadcasters' signals were reported. The other study cited in the *NPRM* was based on results of a TVWS demonstration in Ghana; it also reported the same finding of non-interference to TV broadcasters, notwithstanding the fact that the WSDs operated immediately adjacent to the broadcasters' channels.

In the *Report and Order*, however, the Commission reversed course based on comments submitted by the National Association of Broadcasters ("NAB").[7] NAB contended that to satisfy the adjacent television channel -33 dB D/U (desired to undesired signal ratio) interference criterion would require approximately 800 meters separation between a WSD and a television receiver under free space conditions. NAB also assumed a DTV signal threshold of -83 dBm based on ATSC guidelines. This is reasonable for an adjacent channel that fully occupies the spectrum with zero buffer space; however, the *NPRM* had proposed WSD operation occupying just *half* of an adjacent channel with a three MHz buffer between the ATSC TV receiver and the

[6] Petitioners believe that, if the Commission were to grant their requested reconsideration, it would be useful to TVWS operators for the Commission also to clarify that such operation is permitted either across (a) two adjacent six-MHz TVWS channels, <u>or</u> (b) one bonded 12 MHz TVWS channel of three adjacent vacant TV channels with three MHz of separation to each adjacent channel.

[7] *See Report and Order* at para. 37.

TVWS transmitter. The *Report and Order* thus appears to have wrongly relied on NAB's analysis as if it was based on three MHz of separation. Consequently, the decision set forth in paragraph 37 of the *Report and Order* and codified in Section 15.712 of the rules is flawed.

Although not yet tested, the Petitioners believe that the outcome of testing with a three MHz buffer as described above will result in no more than the 11 meter separation distance between a WSD and a TV receiver, which is a permissible distance under current FCC rules for WSDs operating at a 40 mw power level on an adjacent channel with no buffer zone.

Finally, Petitioners note that in April 2015 – several months before the Commission released the *Report and Order* – NAB purchased a complete kit of the current generation Carlson Wireless TVWS RuralConnect product line with base and client station, for the express purpose of performing joint lab testing in connection with certain TVWS-broadcasting interference issues, including the very issue of whether three MHz of spectral separation between fixed TVWS devices and operating TV broadcasters would cause any interference to TV receivers. After Carlson Wireless delivered the TVWS equipment, NAB informed Carlson that it no longer planned to conduct that joint testing. Carlson Wireless was then prepared, and would now welcome the opportunity, to perform joint field testing with NAB on the three MHz separation issue and to produce a joint report to the FCC by April 30, 2016. If the objective results of that joint testing and report demonstrate that operation of 4 watt EIRP TVWS with three MHz of separation would cause unacceptable levels of interference to TV broadcasters under existing FCC rules, then Petitioners are prepared to withdraw this Petition for Reconsideration. As the Commission is aware, Carlson Wireless has worked cooperatively with NAB on related TVWS matters, and the Petitioners hope to build on that relationship now by exploring this vitally important issue in a reasonable, scientific and objective manner.

. . . . .

For the reasons presented above, Petitioners request that the Commission reconsider and reverse its decision not to allow fixed WSDs to operate at up to 4 watts EIRP within a spectral separation of three megahertz from an occupied TV station band edge.

Respectfully submitted,

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December 23, 2015