

**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	)	ET Docket No. 14-165
	)	
Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions	)	GN Docket No. 12-268
	)	
Unlicensed White Space Device Operations in the Television Bands	)	ET Docket No. 20-36
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186

**Reply Comments of  
THE OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA  
AND PUBLIC KNOWLEDGE**

The Open Technology Institute at New America (“OTI”) and Public Knowledge (“PK”) respectfully submits the following reply comments to the *Second Order on Reconsideration, Further Notice of Proposed Rulemaking, and Order*, in the Unlicensed White Space Device Operations in the Television Bands proceeding (‘Order and Further Notice’).<sup>1</sup> OTI and PK strongly supports maintaining a 24-hour database re-check time for narrowband fixed white

---

<sup>1</sup> *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 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, and Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Second Order on Reconsideration, Further Notice of Proposed Rulemaking, and Order, FCC No. 22-6, ET Docket Nos. 14-165, 20-36, 04-186, and GN Docket No. 12-268 (rel. Jan. 26, 2022) (“Further Notice”).*

space devices (‘WSDs’) and narrowband Mode II personal/portable WSDs. A shorter re-check interval is not necessary to prevent harmful interference and it would undermine the public interest in narrowband use of TVWS for precision agriculture, remote sensing, critical industries and many other important uses.

It is unfortunate that NAB has chosen to use this proceeding to continue its increasingly obsessive vendetta against “big tech” and its near non-stop complaints about the regulatory fees it must pay. NAB’s comments are not merely beyond the scope of this proceeding. They undermine the credibility of NAB’s objections by making clear that they stem not from any genuine technical concern but solely from the desire to “get Big Tech” and undermine the use of unlicensed spectrum. The Commission should disregard this attempt at regulatory warfare and focus solely on the technical matters properly presented in this proceeding.

**I. There is No Need to Increase Database Re-check Intervals for Fixed Narrowband WSDs, a Change that Would Harm Agribusiness and Other Uses Serving the Public Interest**

OTI and PK strongly agrees that the Commission should maintain its current rule for narrowband WSDs, which allows for a 24-hour WSDB re-check interval and allows a narrowband WSD device that is temporarily unable to contact the WSDB to continue operations until 11:59 PM the following day. We agree with Microsoft that “[t]he risk that narrowband WSDs will cause harmful interference to licensed wireless microphones is very low.”<sup>2</sup> There have been few if any reports of interference from fixed TVWS devices to either television reception or licensed wireless microphones, which in any case are also narrowband and can operate if necessary on a different or even an adjacent vacant channel.

---

<sup>2</sup> Comments of Microsoft Corporation, ET Docket Nos. 14-165, 20-36, 04-186, and GN Docket No. 12-268 (July 1, 2022), at 2 (“Comments of Microsoft”).

Against this lack of evidence of harmful interference the Commission must balance the public interest benefits of allowing narrowband WSDs to lower costs and improve productivity in less densely-populated areas for farming, ranching, remote sensing, environmental monitoring and a variety of other innovative uses. The Commission knows from its recent victory in the D.C. Circuit against the NAB’s frivolous lawsuit challenging the agency’s authority to make these decisions based on balancing the probability of harmful interference with the opportunity cost of foreclosing unlicensed or other shared use of vacant or underutilized spectrum.”<sup>3</sup>

There are several reasons why the Commission has no good reason related to undermine the public interest benefits of narrowband WSDs. The first is the Commission’s already overly-conservative requirement that narrowband WSDs must operate in the center of three contiguous vacant TV channels – channels that are also considered “vacant” only because they are far outside the furthest reaches of a licensed broadcaster’s market area and receivable signal. This has two practical effects that should be decisive: Because metro areas lack blocks of contiguous TVWS channels, narrowband WSDs will rarely operate anywhere near an urban area.

Narrowband WSDs will be valuable, as other fixed TVWS operations are today, almost entirely in rural and remote areas where they can yield important benefits for farming, ranching, critical infrastructure, environmental monitoring and other applications where propagation, battery life and form factor are all critical to its workability.

The other reason that the Commission’s overly-cautious rules already over-protect incumbents is that even in the rare case where there is electronic news gathering (“ENG”) out in a farm field or other location in areas with at least three contiguous TVWS channels, the microphone operator can shift to another channel. This would include even one of the two vacant

---

<sup>3</sup> AT&T Servs. v. FCC, 21 F.4th 841 (U.S. D.C. Cir. 2021).

channels adjacent to the one on which a narrowband WSD is operating. Unlike standard fixed WSDs, narrowband WSDs use only a small fraction of a TVWS channel and must be centered within it, maximizing the separation from adjacent channels.<sup>4</sup> ENG itself is narrowband and can create a substantial guard band simply by shifting channels (where it can easily be at least 8 to 9 megahertz distant from the low power and likely ground-level WSD).

Second, the Commission's rules for fixed Mode II personal/portable WSDs severely limit the duration of transmission, making any interference fleeting at worst. These devices are subject to a very low duty cycle limit of 36 seconds per hour, as well as a prohibition on external connectorized antennas and a requirement to contact the database again if the device moves more than 100 meters. The duty cycle limitation seems particularly relevant here with respect to mitigating the risk of harmful interference. Most operators (e.g., farms, ranches, utilities) have strong incentives to maximize battery life and minimize form factor. As a result, it is most likely that these devices will transmit their data (e.g., sensing data) in a brief, occasional burst that is far shorter than even the 36 seconds per hour maximum duty cycle. Fractions of a second is a more likely transmit period for these devices, since the vast majority of applications for narrowband WSDs that are highlighted in the record are agricultural, environmental, utility and other sensors. Further, we concur with Microsoft's request that the narrowband WSD's transmissions utilized for re-checking the availability of white space channels "do not count toward the device's one percent duty cycle."<sup>5</sup>

---

<sup>4</sup> See Comments of Microsoft at 2.

<sup>5</sup> *Id.* at 3.

Third, when the Commission adopted the database “push notification” requirement more than seven years ago,<sup>6</sup> these narrowband and intermittent devices, operating almost entirely in rural and remote areas (and mostly at ground level, if not in the ground), were not at all the risk the agency sought to mitigate. Narrowband WSDs are not produced for consumer mass markets. They will not be in consumer devices – and perhaps not in urban areas at all. And to the extent they might be used on a campus, or in a port facility, or in a warehouse complex, any potential interference to the one-in-a-million chance of ENG use in the vicinity will likely be mitigated by clutter.

Moreover, we agree with Microsoft that the Commission’s decision in this proceeding “should account for the fact that WSDs operated for more than six years with a once-daily re-check interval.”<sup>7</sup> The fact that no harmful interference was reported during this period “is powerful evidence that there is no need to increase the re-check frequency of narrowband WSDs—devices which pose especially little risk of harmful interference.”<sup>8</sup>

Finally, the three incumbent commenters – NAB, Shure and Sennheiser – provide no evidence that fixed narrowband WSDs represent a heightened danger of harmful interference, or really any danger at all. There is little of substance in their comments to support such a burdensome new rule. Their comments just recycle the same old hypothetical fears of harmful interference that these same TV band incumbents have been asserting since, quite literally, 2002!

---

<sup>6</sup> *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; Amendment of Part 74 of the Commission’s Rules for Low Power Auxiliary Stations in the Repurposed 600 MHz Band and the 600 MHz Duplex Gap, and Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 30 FCC Rcd. 9551 (2015).

<sup>7</sup> Comments of Microsoft at 4.

<sup>8</sup> *Ibid.*

Collectively, their objections amount to the same old rehash about why they resent unlicensed access to “their” spectrum and unfounded fears of harmful interference. They ignore the fact that their very narrowband microphone operations can quite easily check the TVDB or shift channels to coordinate (as they often do with one another) if there is unforeseen interference – interference that, as noted just above, would be at worst fleeting because of the Commission’s rules limiting the duration of transmission.

## **II. Relentless NAB Efforts to Undermine TVWS Use in Rural Areas is Misconceived and Part of its Broader Effort to Monetize Free Spectrum**

It is unfortunate that rather than submit a substantive filing, the NAB focuses its comments on claims that Microsoft’s advocacy for workable TVWS rules to bring connectivity to rural and remote households and schools “waste[s] Commission resources” and is particularly egregious because “Microsoft continues to seek these fruitless changes despite paying no corresponding FCC regulatory fees.” The NAB’s relentless and now two-decade-old campaign to undermine unlicensed access to vacant TV channel spectrum might be strangely admirable if the trade association’s motives were not so obvious and self-interested and its targets (Microsoft and, especially, rural broadband beneficiaries of TVWS) were somehow deserving of NAB’s bottomless scorn. Indeed, it’s hard to take NAB’s views about database re-checking intervals for very low-power and narrowband IoT sensors and other devices seriously knowing that broadcasters are primarily dedicated to reclaiming and monetizing vacant TVWS spectrum and to shifting onto unlicensed spectrum users (and “Big Tech”) the regulatory fees its members that hold licenses pay for continued free use of spectrum worth tens of billions of dollars.

It has been clear for two decades that the NAB is convinced the Commission has wrongly reallocated the vacant TV channels for public use. This is particularly ironic in light of the decision by the Commission to expand the value of broadcast licenses by approving the

conversion to ATSC 3.0, without requiring any additional public interest obligations to return to the public the additional value added to the licenses. As the years go by it is increasingly clear that broadcasters view their lack of wider channels and contiguous coverage over much larger geographies as an obstacle to their ultimate goal of monetizing their free TV spectrum (and all TV band spectrum) as over-the-air broadcasting eventually fades away.

Moreover, the NAB's relentless opposition to unlicensed use of vacant TV band spectrum reflects the NAB's reflexive opposition to unlicensed sharing of any of the enormous bands of spectrum they were granted free and which today lie essentially fallow. The NAB's scorched-earth opposition to low-power, indoor-only access to unused 6 GHz spectrum by the public for next generation Wi-Fi is another example. While there is no doubt sporadic use of segments of the 6 GHz band for Broadcast Auxiliary Services, the Commission determined that the public's need for wide channels of unlicensed spectrum at low power indoors for Wi-Fi 6E and Wi-Fi 7 connectivity – a technology that consumers increasingly rely on to transmit the video content of NAB's largest members to many different devices and screens throughout their homes – is worth the tiny risk of fleeting interference to BAS in the rare case where a Wi-Fi device's contention based protocol does not detect a close-by BAS signal in operation. Despite the Commission's clear expertise and authority to make this determination, the NAB wasted the resources of both the Commission and the D.C. Circuit Court of Appeals by filing a frivolous legal challenge that met the predictable back of the court's hand.<sup>9</sup>

Finally, while NAB disparages the limited scale of current TVWS deployments, it ignores the biggest reason for this situation, as well as the important purposes that the limited number of existing deployments serve in promoting broadband equity in rural and Tribal

---

<sup>9</sup> AT&T Servs. v. FCC, 21 F.4th 841 (U.S. D.C. Cir. 2021).

America. In 2010, when the Commission initially adopted TVWS rules and began the process of certifying TVDBs, there were vacant channels in every market and many contiguous channels available for fixed rural broadband use in most rural markets. However, after FCC’s National Broadband Plan in 2010 proposed a TV bands incentive auction, and Congress authorized and mandated the auction in 2012, a cloud of uncertainty descended over the potential market for TVWS equipment, as well as the willingness of WISPs and others to risk deployment when the future of sufficient unlicensed access was very much in doubt. TV station licensees, meanwhile, received more than \$10 billion in reverse auction payments, most of that in return for spectrum that had been vacant TVWS channels available for unlicensed use.

Despite this long period of uncertainty, very conservative rules governing TVWS use, and an enormous reduction in the number of available channels after the incentive auction (including none in some large urban markets), TVWS technology continues to be used by WISPs and some school districts to extend connectivity to unserved and mostly low-income households in rural, Tribal and remote areas. In May 2020 the Public Interest Spectrum Coalition (“PISC”) filed comments documenting deployments that demonstrate TVWS technology has proven itself as a tool to help close the digital divide and the homework gap in rural and Tribal communities.<sup>10</sup> PISC stated: “The lack of deployment and higher costs in rural and tribal areas in particular underscore the urgency of boosting TV White Space technology and deployments to help bridge this gap.”<sup>11</sup>

The comments describe more than a dozen TVWS deployments, both commercial (WISPs) and nonprofit (school districts and Tribal).<sup>12</sup> Among those, PISC notes that

---

<sup>10</sup> Comments of the Public Interest Spectrum Coalition, *Unlicensed White Space Device Operations in the Television Bands*, ET Docket No. 20-36 (May 4, 2020).

<sup>11</sup> *Id.* at 7.

<sup>12</sup> *Id.* at 7-11.



“Microsoft’s Airband Initiative has played a leading role in helping partners (mostly ISPs in unserved rural and tribal communities) to bring broadband access to more than 630,000 unserved people over the past 18 months.”<sup>13</sup>

Another example is the TVWS deployment in Hyde County, North Carolina, which is a partnership between the Hyde County School District and Riverstreet, a local WISP. The TVWS portion of the network serves student households that are rural or lack the line-of-sight necessary for more conventional fixed wireless services. Point-to-multipoint Wi-Fi connections will eventually be co-located where TVWS radios are mounted to expand the coverage and capacity for accessible homes, leveraging the GAA portion of CBRS spectrum.<sup>14</sup> Our groups believe that anything the Commission can do to promote more TVWS deployments using spectrum that would otherwise lay idle promotes more equitable broadband outcomes.

Most importantly, the entire point of the proceeding is to enhance the ability of the public to use the TVWS, especially in rural areas for important IoT uses. NAB cannot credibly argue that TVWS is unworthy of Commission effort because the rulemaking will *enhance* the ability of the public to use TVWS. Setting aside that TVWS uses are valuable in a wide variety of situations already, improving the efficiency of spectrum use through proceedings such as this will further increase the deployment and intensity of use in the TVWS. If the NAB was

---

<sup>13</sup> *Id.*, citing Shelley McKinley, “Microsoft Airband: An annual update on connecting rural America,” Microsoft Blog (March 5, 2020), <https://blogs.microsoft.com/on-the-issues/2020/03/05/update-connecting-rural-america/> (“The price of TV white spaces devices (TVWS) – a new connectivity technology that’s particularly useful in rural areas where laying cable simply isn’t an option – continues to drop. In the last year, the cost of customer equipment has plummeted by 50%, all while achievable speeds have increased tenfold.”) (“Microsoft 2020 Airband Update.”).

<sup>14</sup> Matthew Marcus and Michael Calabrese, “Closing the Homework Gap for Good: School District Wireless Networking Initiative Case Studies,” Report, Open Technology Institute and Schools Health Libraries Broadband Coalition (forthcoming, August 2022).

genuinely concerned about the appropriate allocation of Commission resources, it would cease its reflexive opposition to all things unlicensed and allow the Commission to proceed.

## **CONCLUSION**

OTI and PK strongly supports maintaining a consistent 24-hour database re-check time for all fixed TV White Space devices, including in particular narrowband fixed white space devices ('WSDs'), narrowband Mode II personal/portable WSDs. A shorter re-check interval is not necessary to prevent harmful interference and would undermine the public interest in narrowband use of TVWS, for agriculture, remote sensing and many other important uses.

Respectfully submitted,

**OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA  
AND PUBLIC KNOWLEDGE**

Michael Calabrese  
Director, Wireless Future Program  
Open Technology Institute at  
New America  
740 15th Street NW, Suite 900  
Washington, D.C. 20005

Harold Feld  
Senior Vice President  
Public Knowledge  
1818 N St., NW  
Suite 410  
Washington, D.C. 20036

August 1, 2022