

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Office of Engineering and Technology)	ET Docket No. 18-295
Seeks Comment Following Court)	GN Docket No. 17-183
Remand of 6 GHz Band Order)	

**COMMENTS OF PUBLIC KNOWLEDGE AND THE OPEN TECHNOLOGY
INSTITUTE AT NEW AMERICA**

Kathleen Burke
Policy Counsel
*Admitted to the Bar under D.C. App. R. 46-A
(Emergency Examination Waiver)*
Public Knowledge
1818 N Street NW, Suite 410
Washington, DC 20036

Michael Calabrese
Director, Wireless Future Project
Open Technology Institute at
New America
740 15th Street, N.W., Ste 900
Washington, DC 20005

May 25, 2022

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I. INTRODUCTION

Public Knowledge (PK) and the Open Technology Institute at New America (OTI) respectfully submit these comments in response to the Public Notice titled "Office of Engineering and Technology Seeks Comment Following Court Remand of 6 GHz Band Order" (PN).¹ PK and OTI urge the FCC to find that NAB’s concerns do not require any changes to the 6 GHz Order.

As an initial matter, OET accurately construed the remand order as “limited in scope.”² Supreme Court precedent and the D.C. Circuit’s own opinion in this matter support OET’s decision to narrowly construe its obligation. As the Supreme Court held, “[t]he failure to respond to comments is significant only insofar as it demonstrates that the agency's decision was not based on a consideration of the relevant factors.”³ The D.C. Circuit has applied this principle to prior FCC proceedings, holding that “the FCC need not address every comment, but it must

¹ FCC, *Office of Engineering and Technology Seeks Comment Following Court Remand of the 6 GHz Band Order*, Public Notice, ET Docket No. 18-295, GN Docket No. 17-183, 87 FR 24302 (April 25, 2022).

² *Id.* at 24303.

³ *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416 (1971).

respond in a reasoned manner to those that raise significant problems.”⁴ In the context of this proceeding, the D.C. Circuit explicitly stated that “[i]t is conceivable that the Commission may be able to explain why its experience in the 2.4 GHz band supports its ability to protect licensed mobile operators from harmful interference.”⁵ Refusing to vacate the 6 GHz Order, the D.C. Circuit merely remanded to the FCC for “further explanation.”⁶ Essentially, on remand, the Commission only needs to explain *why* it chose to ignore NAB’s concerns—a decision that is readily justified.

More importantly, a remand order is not a general excuse to reopen the record and give the NAB (or other commenters) a “second bite at the apple.” A remand, especially where the court has simply remanded for further explanation of the Commission’s reasoning, is designed to address those issues specifically remanded by the court—and no others.⁷ Of course, the Commission would need to take additional action if it concludes that it cannot adequately answer the court’s remand based on the current record.⁸ In such an event, the Commission would need to issue a separate notice of proposed rulemaking to modify the original rulemaking in accordance with the APA—simply piggybacking on the existing remand order would not suffice.⁹

But, such drastic measures are unnecessary here. The FCC can easily explain why NAB’s claim that interference with BAS operations in the 2.4 GHz band necessitates reserving spectrum in the 6 GHz band for licensed operation lacks merit. First, NAB did not substantiate its claim that broadcasters have experienced significant interference in the 2.4 GHz band. Second, even if NAB had substantiated its claim, unlicensed interference in the 2.4 GHz band has no bearing on

⁴ *Covad Communs. Co. v. FCC*, 450 F.3d 528, 550 (D.C. Cir. 2006).

⁵ *AT&T Servs. v. FCC*, 21 F.4th 841, 854 (U.S. D.C. Cir. 2021).

⁶ *Id.*

⁷ *See AT&T Wireless Servs. v. FCC*, 365 F.3d 1095, 1103 (D.C. Cir. 2004).

⁸ *Id.*

⁹ *See DHS v. Regents of University of California*, 140 S. Ct. 1891 (2020) (decision of agency on remand is a “final agency action” that requires APA review).

the potential for unlicensed interference in the 6 GHz band. They are materially different bands with different characteristics, different rules, and different use cases. In addition to permitting substantially higher power in 2.4 GHz than allowed for indoor use in 6 GHz, the 2.4 GHz band does *not* require a contention-based protocol for use. While NAB refers to all unlicensed operations in 2.4 GHz as “Wi-Fi” (which does use a contention-based protocol), the 2.4 GHz band is home to hundreds of millions of unlicensed devices, such as baby monitors and Bluetooth devices, that do not use contention-based protocols. Additionally, the 2.4 GHz band is home to licensed ISM radiators that operate at much higher power than unlicensed devices. The experience in the 2.4 GHz band, therefore, has no bearing on the completely different operating rules, propagation characteristics, and device population of the 6 GHz band, especially with regard to indoor use.

II. THE COMMISSION SHOULD DISMISS NAB'S CLAIMS REGARDING THE 2.4 GHZ BAND BECAUSE THEY ARE UNSUBSTANTIATED.

Throughout the 6 GHz proceeding and subsequent appeal, NAB has significantly misconstrued and misrepresented interference to ENG operations in the 2.4 GHz band. This type of obfuscation is similar to the kind the Supreme Court warned about in *Vermont Yankee Nuclear Power Corp. v. NRDC*. There, the Court held that “administrative proceedings should not be a game or a forum to engage in unjustified obstructionism by making cryptic and obscure reference to matters that ‘ought to be’ considered and then...seeking to have that agency determination vacated on the ground that the agency failed to consider matters ‘forcefully presented.’”¹⁰

Unraveling the source of NAB’s alleged concerns is like trying to find a path out of a mirror maze. Upon closer inspection, every claim reflects the same distorted source—an

¹⁰ *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 553-54 (1978).

anecdotal retelling from 2013 of a story that was shared in a meeting back in 2004.¹¹ NAB's only source for alleged interference in the 2.4 GHz band is the Engineers for the Integrity of Broadcast Auxiliary Services Spectrum's (EIBASS) comments. And, the only evidence that the EIBASS provided concerning any interference to BAS by unlicensed devices is an excerpt of a 2013 filing recounting a story about a Phoenix-based BAS frequency coordinator who complained about Part 15 devices causing interference in channels A8 and A9 with ENG receive sites at a meeting during the National Association of Broadcasters convention in 2004.¹² If Part 15 devices in the 2.4 GHz band have such "a long history of causing chronic interference" to ENG operations,¹³ then why is the only interference claim NAB and EIBASS point to a retelling of a story that was shared verbally, but not documented, in 2004? The answer is obvious.

Importantly, NAB could have validated its claims of interference in numerous ways. For example, NAB could have

1. Shown declining equipment sales for the BAS frequencies as broadcasters abandoned use due to increased interference;
2. Provided evidence of the increasingly heroic measures taken by broadcasters to make use of the BAS band in the face of the hypothetical "harmful interference;"
3. Submitted field testing and expert testimony to substantiate the supposed widespread problem of "chronic interference;" or
4. Introduced copies of interference complaints from BAS operations to the FCC's record in the 6 GHz proceeding.

Instead, NAB did not submit *any* evidence showing that use of the 2.4 GHz BAS has decreased over time due to "chronic harmful interference" rendering the BAS band unusable.¹⁴

¹¹ Comments of Engineers for the Integrity of Broadcast Auxiliary Services Spectrum, *In the Matter of Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, at 7-8 (Feb. 15, 2019).

¹² *Id.*

¹³ EIBASS Comments at 7.

¹⁴ Nor can NAB take this opportunity to supplement the record with evidence it did not previously submit. *AT&T Services*, 365 F.3d at 1103 (Commission acted appropriately in

If NAB and EIBASS's concerns were serious they should have provided actual evidence of harmful interference, not just decades-old conference gossip. The lack of evidence demonstrating interference in the 2.4 GHz band provides the Commission with ample explanation for dismissing NAB's concerns.¹⁵

III. REGARDLESS, UNLICENSED INTERFERENCE IN THE 2.4 GHZ BAND IS IRRELEVANT BECAUSE THE 6 GHZ BAND IS MATERIALLY DIFFERENT.

Setting aside the credibility of NAB's interference claims, the impact of interference in the 2.4 GHz band has no bearing on the 6 GHz band. These two bands and the rules governing unlicensed devices authorized to operate in them are materially different. First, the characteristics of the 6 GHz band make it less likely that unlicensed operations in the 6 GHz band will cause harmful interference to incumbents. Second, the Commission adopted additional rules for unlicensed devices in the 6 GHz band that will help limit harmful interference issues. Finally, by limiting the use of unlicensed devices that use a contention-based protocol to indoor-only the Commission

A. The Increased Bandwidth and Poor Signal Attenuation of the 6 GHz Band Decrease The Likelihood that Unlicensed Operations Will Cause Harmful Interference.

NAB's claim that BAS indoor operations neutralize the protection from signal attenuation ignores the different propagation characteristics of 6 GHz frequencies—signal attenuation is not simply indoors v. outdoors. Interference is more likely in the 2.4 GHz band because it is more

rejecting efforts on remand to supplement record and deciding exclusively on basis of initial record).

¹⁵ PK and OTI stress that this public notice does not provide an opportunity for NAB to supplement the record. The court's remand addresses the record at the time of the FCC's initial decision. *SEC v. Chennery*, 332 U.S 194 (1947); *AT&T Services*, 365 F.3d at 1103. The purpose of this remand is for the Commission to explain why it made its decision on the record before it at the time of the Order, not to give NAB a chance to cure deficiencies in its previous filings in this proceeding.

susceptible to signal leakage. Additionally, the poor signal attenuation of the 6 GHz frequencies is a key characteristic of the band that reduces the risk of harmful interference. Moreover, the sheer amount of bandwidth available in the 6 GHz band makes interference caused by congestion much less likely.

The 2.4 GHz band, while not great for penetrating solid objects or heavy building materials, is still far superior to the propagation characteristics in the 6 GHz band. A 2.4 GHz device leaks into neighboring apartments or homes because the 2.4 GHz frequencies travel further and are less sensitive to physical impediments. This is why, as anyone who uses Wi-Fi can attest, a connecting device can detect multiple networks from surrounding neighbors, businesses, and other entities are often detected. This says nothing of signal leakage from other non-network devices. To the extent NAB claims any interference from 2.4 GHz use, it would need to show *actual* harmful interference (which it has not done) that *occurred indoors*, not merely outdoors. Without evidence to the contrary, it is likely that the root of NAB's alleged interference is a general increase in noise level from the leakage of all devices in the area, including outdoor devices, within the same general proximity.

In contrast, 6 GHz frequencies can travel less distance and are significantly more susceptible to physical impediments. Indeed, the Commission authorized indoor use throughout the band in large part because of the 6 GHz band's poor signal attenuation.¹⁶ As the Commission explained, unlicensed device signals “will be significantly attenuated when passing through the walls of buildings. The median signal loss from a traditionally constructed building is 17 dB and newer, highly efficient buildings provide even higher signal attenuation.... This attenuation is key to providing the necessary signal reduction to prevent harmful interference...”¹⁷ Even if NAB

¹⁶ 6 GHz Order at ¶ 100.

¹⁷ *Id.*

could demonstrate harmful interference from indoor operations in the 2.4 GHz band, the poor signal attenuation of the 6 GHz band in combination with additional device restrictions ensures that this leakage will not occur in the 6 GHz band.¹⁸ This distinguishes even indoor use of 6 GHz from 2.4 GHz.

Finally, because there is significantly more spectrum available for unlicensed operations in the 6 GHz band the risk of interference is lower. The 6 GHz band will allow unlicensed devices to operate indoors across 1,200 MHz of spectrum whereas the 2.4 GHz band only allows unlicensed use across 83 MHz of spectrum. This translates to significantly more bandwidth which makes overcrowding less likely. By opening up the 6 GHz band for unlicensed use, it is also quite possible that broadcasters will experience a decline in their alleged 2.4 GHz interference as more unlicensed devices move to the 6 GHz band.

The 2.4 GHz and 6 GHz bands have significantly different signal attenuation, propagation characteristics, and bandwidth. These differences are material and offer ample explanation for why the Commission chose to ignore NAB's concerns about interference in the 2.4 GHz band.

B. Unlike in the 2.4 GHz Band, Unlicensed Devices in the 6 GHz Band are Required to Use a Contention-Based Protocol and Limited to Low Power Levels—Significantly Reducing the Risk of Harmful Interference.

The rules governing unlicensed devices in the 6 GHz band are significantly different and more likely to prevent harmful interference than those governing unlicensed devices in the 2.4 GHz band. First, 6 GHz unlicensed devices are required to use a contention-based protocol to mitigate interference with incumbents—2.4 GHz unlicensed devices are not. Second, the Commission authorized unlicensed devices in the 6 GHz band at significantly lower power levels

¹⁸ 6 GHz Order at ¶ 107.

than those in the 2.4 GHz band. These rules are significantly different and will effectively mitigate the risk of harmful interference to incumbents in the 6 GHz band.

Unlicensed devices in the 2.4 GHz band are not required to use a contention-based protocol. Even though Wi-Fi devices operating in the 2.4 GHz band use the "listen before talk" operating procedure in IEEE 802.11, there are many devices in the 2.4 GHz band that do not use such a protocol. Although NAB refers to all unlicensed devices in the band as "Wi-Fi," the reality is that the 2.4 GHz band is home to hundreds of millions of devices that do not use Wi-Fi and have no contention-based program. As the Wi-Fi Alliance explained, "[t]he 2.4 GHz band is used by a broad range of unlicensed devices including among others, microwave ovens, garage door openers, cordless telephones, baby monitors, and a variety of Bluetooth devices."¹⁹

NAB offers no evidence that Wi-Fi devices, rather than the plethora of microwaves, security cameras, and other devices without a contention-based protocol, are responsible for whatever interference users of BAS experience. Despite the efficiency of Wi-Fi spectrum reuse, the overcrowding of the 2.4 GHz band with such devices has made the band increasingly noisy, making it difficult even for standard Wi-Fi routers to operate in this band. It is highly likely that the alleged interference broadcasters experience due to unlicensed use of the 2.4 GHz band stems from the lack of a mandatory contention-based protocol, not despite such a protocol as NAB claims.

Moreover, the power levels of unlicensed devices in the 6 GHz band are significantly lower than those of the 2.4 GHz band. Part 15 devices in the 2.4 GHz bands are authorized to operate at a range of power levels—the lowest is .125 watts which equates to 20.969 dBm.²⁰ In contrast, the Commission authorized unlicensed devices in the 6 GHz band to operate at 5

¹⁹ Wi-Fi Alliance, Letter to Ms. Dortch, *In re: Summary of Oral Ex Parte Communication*, ET Docket No. 18-295, GN Docket 17-183 (Jan. 21, 2022).

²⁰ 47 C.F.R. § 15.247(b)(1); *see also* 47 C.F.R. §§ 15.247, and 15.249.

dBm/MHz PSD.²¹ This means that even the least powerful 2.4 GHz unlicensed devices are four times more powerful than 6 GHz unlicensed devices. This alone means that any interference broadcasters have experienced from unlicensed devices in the 2.4 GHz band is irrelevant. By weakening the power levels of indoor unlicensed operations in the 6 GHz band, the Commission has effectively mitigated the risk that unlicensed devices in the 6 GHz band will cause harmful interference.

C. Limiting Unlicensed Use in the 6 GHz Band to Indoor-Only Allows Venues to Reserve Spectrum for BAS Operations In the Unlikely Event that BAS Operations Experience Interference.

NAB's concerns about indoor-unlicensed operations causing harmful interference to its outdoor ENG operations center around large event venues and sporting facilities. Not only has NAB failed to present any evidence of comparable scenarios occurring in the 2.4 GHz band, but also given the previously discussed differences in the two bands such an example would have to meet an incredibly unlikely set of circumstances: a mobile BAS operator would have to enter a private indoor space where a 6 GHz unlicensed device is operating and set its receiver directly on top of the 6 GHz unlicensed receiver. Then, the unlicensed device's contention-based protocol would have to fail to detect the much stronger and continuous signal of the licensed BAS user.

Thankfully, as the Court found above, the FCC is not required to consider every possible scenario, nor must it eliminate *any* possibility of harmful interference.²² This is especially true where, as here, opponents of the rule submitted no data to substantiate how likely their hypothetical indoor interference might be—let alone engineering data that would show that even

²¹ FCC, Report and Order and Further Notice of Proposed Rulemaking, ET Docket No. 18-295, GN Docket No. 17-183, ¶ 110 (rel. April 24, 2022).

²² AT&T Servs., 21 F.4th 841, 846 (D.C. Cir. 2021).

if this improbable scenario *did* occur, it would result in harmful interference to licensed BAS operations.

In any event, because unlicensed sharing of BAS spectrum is restricted to low-power, indoor-only routers, the venue has control over the unlicensed use of 6 GHz. The building owner or manager can choose not to operate Wi-Fi routers on one or more BAS bands or channels during the presumably infrequent occasions broadcast licensees will need to use it. And, since interference with BAS operations will likely only occur when the BAS operator is on the premises, it would be a simple matter to identify the source of any interference and—in accordance with well established Commission law and practice—require the Part 15 device to cease operation while the BAS licensee is present.

V. CONCLUSION

The Commission has ample opportunity to provide a reasoned analysis for why it ignored NAB's concerns about interference in the 2.4 GHz band. First, NAB's claims are unfounded and unsubstantiated within the record. Second, the 2.4 GHz band and the 6 GHz band are materially different which makes the alleged interference broadcasters have suffered in the 2.4 GHz band irrelevant to interference concerns in the 6 GHz band. The propagation and poor signal attenuation of 6 GHz frequencies make operations in the 6 GHz band less likely to cause interference. Additionally, the Commission adopted more restrictive rules for unlicensed devices in the 6 GHz band that will also limit the risk of harmful interference to incumbents. Finally, even though NAB's concerns about hypothetical interference in event and sporting venues are highly unlikely, venues can easily mitigate any interference that does occur by ceasing their operations in the 6 GHz channels BAS operators need to use.

These reasons more than justify the Commission's decision to ignore NAB's concerns. Thus, PK and OTI urge the FCC to find that NAB's concerns do not require any changes to the 6 GHz Order.

Respectfully Submitted,

/s/ Kathleen Burke
Policy Counsel
Admitted to the Bar under D.C. App. R. 46-A
(Emergency Examination Waiver)

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1818 N Street NW, Suite 410
Washington, DC 20036

/s/ Michael Calabrese
Director, Wireless Future Project

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