

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

In the Matter of:)
)
Expanding Use of the 12.7-13.25 GHz Band for) GN Docket No. 22-352
Mobile Broadband or Other Expanded Use)
)

**COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS**

I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)¹ hereby submits comments in response to the Commission’s Inquiry in the above captioned matter.² As the Commission considers whether and how to expand use of the 12.7–13.25 GHz band (the “13 GHz band”) it should first examine how best to retain some portion of the band for broadcasters’ use. Broadcast mobile operations (electronic news gathering or ENG) are already being displaced from the 2 and 6 GHz bands due to increased interference from band-adjacent AWS systems (in the case of the band 2025–2110 MHz) and expected interference from Wi-Fi 6E systems (in the case of 6425–6525 MHz and 6875–7125 MHz). The 13 GHz band is critical for broadcasters particularly in areas where frequency congestion precludes use of lower frequency bands such as the 2 and 6 GHz bands, and broadcasters simply do not have

¹ The National Association of Broadcasters (NAB) is the 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 *Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use*, Notice of Inquiry and Order, GN Docket No. 22-352, FCC 22-80 (rel. October 28, 2022) (NOI).

access to alternative spectrum bands for ENG operations. Managing the limited resource of radiofrequency spectrum is an increasingly complex task involving balancing competing demands. Efforts to expand spectrum use must ensure the spectrum rights of existing users are not diminished and that existing licensed operations are fully protected. While it may be possible to accommodate expanded use of the 13 GHz band by repacking broadcasters into a smaller portion of the band, the Commission must ensure that broadcasters continue to have access to spectrum they need to cover live events and breaking news, in this and other bands. If the Commission moves forward with a proceeding to expand operations in the 13 GHz band, it must ensure that repacked broadcast licensees will be fully protected from interference from potential new uses and that the costs of any relocation or repacking of incumbent facilities will be covered by those new users.

II. THIS SPECTRUM IS USED BY BROADCASTERS FOR BOTH FIXED AND MOBILE OPERATIONS

The NOI correctly states that the band 12.7–13.25 GHz is allocated on a primary basis and used for fixed links in the broadcast auxiliary service (BAS).³ Broadcasters commonly refer to this spectrum as the “13 GHz band.” A check of the Commission’s engineering database (ULS) shows 1,671 records for fixed links licensed to broadcasters in the 13 GHz band. These include 1,154 television intercity relay (ICR) stations,⁴ 485 television studio-

³ NOI at ¶ 8.

⁴ An ICR is a microwave circuit carrying program material or related communications between two points. Examples a link carrying breaking news coverage from an ENG central receive site to the TV station studio and a link feeding the station’s programming to a television translator station or cable headend located in a remote area.

transmitter links (“STL”),⁵ one aural intercity relay, and 31 television translator relay stations. These figures are similar to those reported in the Inquiry.⁶

The 13 GHz band is generally not favored by broadcasters for long-distance high reliability links such as STLs and ICRs because it is far more susceptible to attenuation due to precipitation than lower frequency bands and has greater free-space propagation loss, which is proportional to the square of frequency.⁷ Despite those limitations, the 13 GHz band is often necessary for shorter distance links in locations where fixed receivers are concentrated such that no other suitable spectrum is available in other frequency bands due to frequency congestion.

As an example, Mt. Wilson near Los Angeles is the transmitting site for some 25 television stations.⁸ Here, a portion of the 6 GHz band (6875–7125 MHz) is generally favored for STL and ICR use, but there are only ten 25 MHz channels available in that band – far fewer than would be needed to accommodate the needs of 25 television stations.⁹ ULS shows 17 STLs and 17 ICRs at Mt. Wilson in the 6 GHz band, which collectively occupy all of the available 6 GHz channels. While some frequency reuse is possible because of the physical separation of some stations and by careful engineering designs, such as cross-polarization

⁵ An STL is the primary circuit that carries programming from a television studio (commonly located in a city) to a transmitter site (often located on a mountain top) some distance away. Loss of the STL due to interference or other reasons would result in the station being unable to transmit programming (including emergency information) to the public. STLs are designed to the highest standards of reliability, such as 99.999%, meaning about five minutes downtime per year would be expected.

⁶ NOI at ¶ 8.

⁷ GTE Lenkurt, “Engineering Considerations for Microwave Communications Systems,” (1972: Lenkurt Electric Co.), p. 46ff.

⁸ [https://en.wikipedia.org/wiki/Mount_Wilson_\(California\)#Television](https://en.wikipedia.org/wiki/Mount_Wilson_(California)#Television)

⁹ 47 CFR § 74.602.

discrimination and use of ultra-high-performance antennas, there is simply insufficient spectrum in the 6 GHz band to accommodate all of the BAS links needed. Accordingly, broadcasters must rely on the 13 GHz band to accommodate additional stations. The Commission's ULS database shows 13 STLs and 34 ICRs authorized at Mt. Wilson in the 13 GHz band, many of which are "overflow" from the 6 GHz band, where no channels are available because of frequency congestion. While there are higher frequency bands allocated for such uses, such as 18 GHz,¹⁰ both free-space path loss and rain attenuation increase rapidly with frequency, limiting applications in those higher-frequency bands to circuits requiring lesser reliability or traversing shorter distances. In many or most cases, therefore, relocation of fixed links from the 13 GHz band to another frequency band will not be feasible.

The NOI also correctly states that portions of this band are used for mobile electronic newsgathering operations (also known as television pickup stations), with spectrum allocated on a primary basis for mobile use within a 50-kilometer radius of 100 major television markets.¹¹ ULS shows 403 records for mobile stations licensed to broadcasters for television pickup stations. Some wireless cameras and news trucks use 13 GHz spectrum directly to transmit from breaking news locations to central receive sites. At Mt. Wilson, for example, there are three central receive sites authorized in the 13 GHz band. The 13 GHz band is becoming increasingly important for ENG because of frequency congestion in large markets, and also due to crippling interference to 2 GHz ENG receivers from AWS operations in the adjacent bands, which the Commission has failed to adequately address.¹² The next available

¹⁰ *Ibid.*

¹¹ NOI at 4, 10

¹² See, e.g., "Interference to WABC-TV by out-of-band emission from Verizon Wireless AWS operations," letter and Informal Complaint against Cellco Partnership dba Verizon

(higher) frequency bands available for ENG use are in portions of the 6 GHz band, 6425–6525 MHz (U-NII-6) and 6875–7125 MHz (U-NII-8), which were recently authorized by the Commission for unlicensed low-power indoor operations such as Wi-Fi 6E. NAB and others have expressed concern, based on both past experience and comprehensive computational simulations, that uncoordinated unlicensed operations will limit broadcaster use of the 6 GHz band for ENG.¹³ To date, those concerns have not been disproven. NAB submits that Wi-Fi 6E consumer equipment and enterprise deployments are just beginning to become common and there is inadequate real-world experience to determine whether, or how much, those unlicensed systems will affect ENG operations. NAB has repeatedly urged the Commission to reserve a small portion of the 6 GHz band exclusively for licensed mobile use until real-world data are available justify the removal of such reservation.¹⁴ The Commission has taken no action on that recommendation.

The 13 GHz band is also commonly used by broadcasters for intermediate “short-hop” temporary mobile links, such as from a cluttered (obstructed) downtown area to a remote truck or central receive site. One example is the New York Marathon, where tall buildings prevent reliable, direct RF connections from cameras on pace vehicles (often motorcycles) to remote trucks or central receive sites along the course. In such cases, temporary “shoe box” receivers are set-up on windowsills or building rooftops along the route that pick-up the wireless camera signal (typically at 2 or 6 GHz) and relay it to remote trucks or central receive

Wireless, from Tom W. Davidson to Bruce Jacobs, Chief Spectrum Enforcement Division, FCC, March 4, 2015.

¹³ See, e.g., letter from Rick Kaplan to Marlene H. Dortch, ET Docket 18-295, December 5, 2019 (and attached Alion engineering study).

¹⁴ Letter from Patrick McFadden to Marlene H. Dortch, ET Docket No. 18-295 (March 18, 2022).

sites using 13 GHz spectrum. These temporary mobile links cannot be accommodated in other bands due to frequency congestion.

III. THE BAND IS NOT WELL SUITED FOR TRADITIONAL MOBILE SERVICES, BUT WILL BE INCREASINGLY IMPORTANT FOR BROADCASTERS AS OTHER ENG SPECTRUM IS SQUEEZED

As discussed above, free-space propagation loss increases with the square of frequency. Thus, the 13 GHz band is generally used by broadcasters for mobile applications only over short distances or where lower frequency spectrum is not available because of congestion. NAB expects similar limitations will be associated with mobile broadband and similar expanded uses. Experience with mobile wireless operations near 28 GHz, such as Verizon's "Ultra Wideband" network, shows that mobile user equipment functions adequately only within a short distance of a base station (gNodeB), such as 50 to 100 meters, limiting its use for mobile consumer applications to sports fields, shopping malls and other inherently limited areas. Physics dictates that at 13 GHz, the coverage distance for mobile user equipment will approximately double to perhaps 200 meters, which is likely too small to be economical for traditional mobile services.

That broadcaster's mobile use of 13 GHz is relatively limited does not diminish its importance where alternatives are not available. As broadcasters have negotiated with the U.S. Defense Department to allow coordinated military operations in the 2 GHz band and the FCC has required broadcasters to accept uncoordinated unlicensed use of the 6 GHz band, spectrum suitable for ENG is becoming increasingly scarce and congested. Because ENG operations are "one shot," broadcasters require high reliability for these operations and cannot tolerate interference from uncoordinated systems. The mobile systems employed by broadcasters are distinguished from traditional consumer mobile equipment in part by pseudo-engineered paths and elevated, high-gain antennas. The FCC must ensure that

incumbent broadcast auxiliary operations at 13 GHz are protected, particularly as spectrum at lower frequency bands becomes increasingly congested.

IV. SHARING METHODOLOGIES ARE NOT SUITED TO PROTECTING ENG AND OTHER UNCOORDINATED MOBILE OPERATIONS

All sharing regimes must recognize and deal with the “hidden node” problem. Hidden nodes arise, for example, when passive receivers cannot be detected or protected by other spectrum users. All one-way transmission systems, including ENG, are particularly subject to hidden node interference because the locations and characteristics of the receivers are typically not known. The hidden node problem is significant for BAS operations because many of them are one-way as stated in the NOI.¹⁵ The BAS receivers cannot be sensed. Further, particularly for temporary and itinerant operations, such as those described previously for the New York Marathon, the locations are not contained in any database. The only way to protect such hidden nodes is to exclude uncoordinated operations from the spectrum used by BAS for mobile operations. That is the reason why portions of the 13 GHz band are reserved for ENG within a 50-kilometer radius of 100 major television markets. As a result, database-driven automated frequency coordination (AFC) systems and spectrum sensing approaches would not be feasible or adequate in areas where BAS mobile operations are authorized.

V. CONCLUSION

As the Commission continues to consider expanded operations in bands with existing users, it must ensure that broadcasters retain reliable access to spectrum to cover live events and breaking news. NAB acknowledges that it may be possible to repack broadcaster operations in the 13 GHz band into a smaller portion of the band, assuming the Commission adopts rules that will protect those broadcaster operations and ensure that broadcaster do

¹⁵ NOI at ¶ 8.

not bear any costs associated with relocation. However, the Commission and other interested stakeholders must acknowledge that this task has been made more complicated by the Commission's actions reducing broadcasters' access to spectrum in other bands. We look forward to working with the Commission and other interested stakeholders in this proceeding.

Respectfully submitted,

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BROADCASTERS**

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A handwritten signature in black ink, appearing to read "Rick Kaplan", with a long horizontal line extending to the right.

Rick Kaplan
Patrick McFadden
Alison Neplokh
Robert Weller

December 12, 2022