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

In the Matter of:	)	
	)	
Upper C-band (3.98 to 4.2 GHz)	)	GN Docket No. 25-59
	)	

REPLY COMMENTS OF THE NATIONAL ASSOCIATION OF BROADCASTERS

I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)[1] submits its responses to comments filed in the above-captioned Notice of Inquiry.[2] NAB again emphasizes that use of the Upper C-band for satellite program contribution and distribution is critical to the broadcast industry and that use has become more intense since the "Lower C-band" auction less than five years ago.[3] While the Lower C-band transition occurred largely without disrupting incumbent C-band services, that success was possible only because the Commission preserved a substantial portion of C-band for satellite use. NAB believes that further expansion of new services into Upper C-band will be dramatically more complex and expensive than Lower C-band and will result in material degradation and interruption of broadcast services. Any expanded use of the Upper C-band spectrum must ensure: (1) that continuing incumbent operations remain fully

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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 FCC Notice of Inquiry, *Upper C-band (3.98 to 4.2 GHz)* GN Docket No. 25-59, FCC 25-13 (Feb. 27, 2025) (Notice of Inquiry or Notice).

3 *Auction of Flexible-Use Service Licenses in the 3.7–3.98 GHz Band Closes — Winning Bidders Announced for Auction 107*, Public Notice, AU Docket No. 20-25, DA 21-207 (Feb. 24, 2021).

protected from interference to the extent there are any changes made to the Upper C-band; and (2) that the unique capabilities of C-band that incumbent users rely upon are fully preserved to the extent those users may be transitioned to other bands or platforms.

II. ALLEGED DEMAND FOR WIRELESS SERVICES DOES NOT JUSTIFY MORE SPECTRUM

A. A Shortage of Capacity is not the Same as a Spectrum Shortage

As has become commonplace, the wireless industry paints an exaggerated picture of spectrum saturation to justify further spectrum allocation. CTIA claims that the United States lags behind peer nations in licensed mid-band spectrum by an average of roughly 200 MHz and without additional spectrum, U.S. networks will be unable to meet nearly a quarter of peak traffic demand by 2027.[4] These claims from the wireless industry, however, of "spectrum crisis," "spectrum shortage," and "spectrum crunch" repeat hyperbolic contentions of the past.[5] To buttress those earlier assertions of looming catastrophe, the wireless industry previously trotted out paid-for eye-popping forecasts of how mid-band spectrum is on the verge of saturation for critical use cases.[6] They claimed that a revolution in wireless applications was on the cusp. And so, to meet that supposed explosion of demand that was just around the corner, spectrum was auctioned for the overhyped yet ill-defined, "5G" technology. As it turns out, the wireless industry's claims that 5G would revolutionize wireless applications never materialized.

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4 CTIA *Ex Parte* Presentation by Ajit Pai and Scott Bergmann to Commissioner Anna Gomez and Edyael Casaperalta, GN Docket 25-59 (May 14, 2025) (CTIA *ex parte*).

5 Comments of CTIA, ET Docket 10-235 at 4 (March 18, 2011) (CTIA 2011 Comments).

6 Aalok Mehta & J. Armand Musey, *Overestimating Wireless Demand: Policy and Investment Implications of Upward Bias in Mobile Data Forecasts*, 23 COMMLAW CONSPECTUS 300 (2015).

For example, despite its claim that the Lower C-band "has proven crucial in delivering the benefits of 5G to American consumers and enterprises,"[7] Verizon has only improved average "5G" download speeds by an anemic 12 percent from mid-2020 until early 2025[8] – even though Verizon won the vast majority of Lower C-band licenses offered during Auction 107.[9] Verizon now claims that Upper C-band spectrum "will deliver the connectivity and capabilities that American consumers and enterprises need."[10] But like before, there is no reason to take the wireless industry's claims at face value – particularly given how they ignore the reality of how its spectrum is actually being used and posit poor spectrum management policies. While in the past the Commission has played the part of wireless industry cheerleader, the FCC now has ample reason to examine the wireless industry's claims with great skepticism. If it continues to roll out the red carpet as a result of slogans rather than real-world experience and data, the Commission risks reallocating spectrum in a manner that causes material degradation to critical incumbent operations while providing little-to-no benefit to the public by extending spectrum to speculative use cases.

Even if the Commission were to believe that some or all these use cases are likely to become reality in the not-too-distant future, there are other ways to achieve greater throughput than to gift more spectrum to the commercial wireless industry. For example, splitting cells and employing improved channel coding could increase throughput without any need for additional spectrum. To be sure, there is now greater capacity because of prior spectrum auctions,

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7 Verizon comments at 1.

8 https://www.opensignal.com/reports/2020/06/usa/mobile-network-experience and https://www.opensignal.com/reports/2025/01/usa/mobile-network-experience (retrieved May 21, 2025).

9 https://auctiondata.fcc.gov/public/projects/auction107/reports/results_by_license

10 Verizon comments at 2.

including Lower C-band, but the promises of ultra-low latency gaming, remote surgery, and network slicing have not materialized. In fact, many broadcasters have expressed interest in the "network slicing" capabilities of 5G-NR as an alternative to operating and maintaining private, broadcaster-owned electronic newsgathering (ENG) systems. But to date, network slicing capability is either unavailable or available only at extreme cost. This pattern of bait-and-switch claims by wireless companies must end, and the FCC should not continue to believe speculative claims that more spectrum is the only solution for capacity demands.

In making any decision to expand the use of Upper C-band to new services, the Commission should focus on minimizing disruption to incumbents, not on maximizing revenue from a spectrum auction. As a matter of spectrum policy, the Commission has historically sought to minimize impacts on incumbent users.[11] Before the Commission rushes to clear bands that are currently in heavy use, it should ask whether the operators have exhausted options to leverage technology improvements and network densification to meet capacity needs. Put simply, the burden should fall on proposed entrants to do all they can to optimize their throughput before calling on the Commission to open more spectrum that runs the risk of causing interference to or significantly constraining incumbent users. Nor should the Commission readily accept forecasts from parties that have an interest in hoarding more spectrum – especially when those projections of wireless demand have proven consistently erroneous in the past. Forecasts seeking to justify reallocation of spectrum, a limited resource, should have a high burden of proof. Consumers do not want or care about spectrum itself. They want to make phone calls, send text messages, and exchange data. The amount of spectrum

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[11] See, *e.g.,* 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 ¶ 14 (rel. October 28, 2022).

needed for those purposes depends equally on the technology employed, the topology of a carrier's network, and its pricing models. Simply put, forecast demand for network throughput is not the same as demand for spectrum.

B. China's Spectrum Policy Should Not Dictate the Commission's Approach

CTIA's claim that "China could soon have nearly four times more 5G spectrum than the United States"[12] is both meaningless and irrelevant. It is meaningless because there is no such thing as "5G spectrum" in the United States. Wireless spectrum is allocated on a technology agnostic basis. Unlike broadcasters, U.S. wireless providers are free to upgrade the technology used in their spectrum from 2G to 3G to 4G, to 5G and beyond, all without FCC approval. Their failure to make adequate spectrum available for 5G is not because spectrum is lacking, it is because of their unwillingness to upgrade.

Comparing the amount of "5G spectrum" arguably available in China *versus* the United States is also irrelevant because the demands and applications for wireless services in the two countries are different. The spectrum allocation approach also differs greatly. This argument is much like a teenager trying to convince their parents to buy the teen a car because their friend's parents got them a car. Jealousy is not a compelling reason. Ensuring the most efficient use of existing spectrum resources should be the FCC's priority, not maximizing revenue of wireless companies. The FCC should see through the wireless industry's transparent and cynical attempt to import generic competitive fears regarding China to this inapposite context.

III. ALTERNATIVES TO C-BAND ARE NOT NECESSARILY REPLACEMENTS FOR C-BAND

As many commenters observe, fiber is already widely used to deliver video content with low latency and great capacity. These features are desirable but useless unless fiber is actually

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[12] CTIA *ex parte* at 1.

available. There are many MVPD headends, generally serving a small number of subscribers located in rural areas without fiber connectivity, that presently rely on C-band for distribution of broadcast network content. Unsupported claims that "the focus of fiber deployment is increasingly in rural areas"[13] are no guarantee that fiber will be brought to every headend within some time frame. NCTA correctly notes that "Upper C-band's importance is especially evident in rural and remote parts of America, where new fiber deployment can be cost-prohibitive or logistically challenging and other wireless technologies are not full substitutes, leaving the Upper C-band as the only viable media and content distribution option in many locations."[14]

While single path fiber may arguably be reliable enough for distribution to headends (if it is available), it is not reliable enough for contribution of content to broadcast networks. Broadcast networks insist on exceptional reliability to ensure that content reaches the network even in the presence of failures. Achieving broadcast reliability using fiber generally requires having two independent fiber paths to account for the inevitable "back-hoe fades" (inadvertent fiber cuts often due to construction) and other disruptions. Verizon correctly observes that, as an alternative to having two independent fiber paths for program contribution, broadcasters often rely on a combination of fiber and satellite.[15] This alternative, of course, requires that fiber be available in the first place. Fiber connections are simply not available at many college sports venues, for example.

Achieving reliability in other satellite bands that is comparable to C-band often requires constructing redundant satellite downlink sites that are sufficiently separated geographically to

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[13] Verizon comments at 8.

[14] NCTA comments at 2.

[15] Verizon comments at 8.

avoid the localized impacts of "rain fade." Such construction is expensive and may involve lengthy permitting or other processes, which must be accounted for in any reallocation consideration. The downlink sites must also have connectivity between them, such as fiber or microwave. In short, achieving comparable reliability to C-band in other satellite bands is possible, but it may require substantial construction of new facilities.

The Lower C-band transition typically involved satellite users shifting frequency within C-band, pointing an antenna toward another C-band satellite, and installing a low-cost filter. Even when rain fade is not a significant risk, any reallocation of Upper C-band is likely to require many C-band users to shift to an entirely different satellite band. This will involve wholesale replacement of antennas, waveguides, and receivers – a dramatically more extensive, complex, and expensive undertaking.

As NAB commented previously,[16] C-band satellites implement hemispheric coverage, which is not typically available in Ku-band satellites but is critical to providing simultaneous cross-continent and intercontinental delivery. A single C-band satellite can simultaneously cover the contiguous United States, its Caribbean territories, and Alaskan rural areas. Indeed, the Commission recognized that the "C-band service is often the only option available to reach remote villages [in Alaska]."[17] The Commission's conclusion has been echoed by Alaskan telecommunications providers.[18] Achieving that capability at Ku-band may require a lease of transponders on multiple Ku-band satellites or spot-beams, which will be far more expensive if not economically infeasible in rural areas. Maintaining C-band coverage solely for the benefit of

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16 NAB Comments at 3.

17 FCC, Report and Order, Expanding Flexible Use of the 3.7 to 4.2 GHz, 35 FCC Rcd 2343 ¶ 132 (2020) (Lower C-band Report & Order).

18 Alaska Telecom Association Comments; GCI Communication Corp. Comments.

Alaskan coverage would be prohibitively expensive. Ordinarily the costs associated with satellite transmission are shared among thousands of reception sites across the country. Without CONUS users of this spectrum, the costs of providing C-band coverage to Alaskan villages and other rural areas would skyrocket, resulting in disproportionate economic impacts to rural communities or loss of service entirely.

As NAB previously commented, the C-band is also used to distribute television and radio programming, as well as other content, from Canada and Mexico and other countries around the world.[19] Broadcasting, like many other industries, is a global industry that relies on cross-border communication to function. NAB agrees with NABA that "[t]o the extent the FCC restructures the C-band, it must prioritize bilateral frequency coordination processes to avoid service disruptions, including especially any disruptions that impact the delivery of American radio or television content."[20] In addition to the delivery of American content to broadcasters in other countries, the ability of U.S. broadcast networks to receive foreign content must also be protected. For example, Spanish language networks in the United States receive sports and other content from outside the United States using C-band. This content is received directly at broadcast network hubs, not at remote "gateway" sites. The ability of U.S. broadcasters to continue to deliver such content would be crippled if content must be received at remote "gateway" locations and then retransmitted to network hubs for delivery to broadcast stations. The costs of supporting that additional infrastructure must not be borne by broadcasters. Unless the global C-band broadcast ecosystem will be converted to other platforms as part of this proceeding, broadcasters must continue to have the ability to directly downlink offshore programming.

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[19] NAB comments at 3.

[20] North American Broadcasters Association Comments at 4.

IV. LESSONS FROM THE LOWER C-BAND TRANSITION

Several commenters note that substantial, fundamental changes to radio altimeter (RA) designs will be required if the Upper C-band is opened to terrestrial mobile use. Whereas the interference from operations in the Lower C-band could be mitigated by adding a filtering function to existing RA equipment, operation in the Upper C-band will require a redesign.[21] Out-of-band emissions falling in the RA band, or in any remaining C-band spectrum that may be reserved for satellite use must be tightly restricted – with tighter limits than those adopted by the Commission in the Lower C-band.

Existing OOBE levels from wireless systems operating in Lower C-band have proven inadequate to prevent harmful and frequent interference to occasional use (OU) satellite receivers[22] and, despite having negotiated procedures to mitigate such interference, wireless companies have proven reluctant to take any action to identify the specific sources of interference much less eliminate them. The base station OOBE limits of -13 dBm/MHz adopted by the Commission[23] were inadequate to protect both radio altimeters and OU satellite downlinks. If satellite operations remain in some portion of the Upper C-band the Commission must set a higher bar for OOBE that may interfere with services in adjacent bands.[24]

As NAB commented previously, the Commission's recommended multi-disciplinary group to deal with post-transition interference issues resulted in useful analysis and consensus recommendations, but no "teeth."[25] If incumbent operations remain in Upper C-band, there

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21 Airbus Commercial Comments at 1; Lockheed Martin comments at 4.

22 PSSI Comments at 2.

23 Lower C-band Report & Order ¶ 320.

24 Garmin International Comments at 8.

25 NAB Comments at 7.

must be a mechanism forcing uncooperative wireless operators to help identify interference sources and shut down wireless facilities to resolve interference problems.

V. CONCLUSION

Numerous broadcasters and broadcast content providers have made clear the vital role that C-band plays in broadcasters' production and distribution of programming.[26] The success of the Lower C-band transition was possible only because incumbent users could be relocated within the C-band. This relocation, which was completed just two years ago, maximally compressed use of the Upper C-band; further packing within the band is not possible. Any further reduction in C-band spectrum for satellite use will involve complex and expensive technology changes. The Commission must prioritize the protection and continuity of incumbent users in considering any expanded uses to ensure that experience of local viewers is not degraded.

Respectfully submitted,

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[26] Content Companies Comments; E.W. Scripps Company Comments; Globecast America Comments.