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
	)	

COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS

1 M Street, SE
Washington, DC 20003
(202) 429-5430

Rick Kaplan
Nandu Machiraju
Alison Martin
Robert Weller

January 20, 2026

TABLE OF CONTENTS

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
	)	

COMMENTS OF THE NATIONAL ASSOCIATION OF BROADCASTERS

I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)[1] submits its initial comments in the above-captioned Notice of Proposed Rulemaking.[2] As NAB has emphasized in prior filings, we remain deeply concerned about the impact that an auction of Upper C-band spectrum would have on broadcast customers.[3] The Upper C-band is essential to the broadcast industry for satellite program contribution and distribution. And such Upper C-band use has intensified since the "Lower C-band" auction less than five years ago.[4] While we recognize that the Commission is required by statute to auction at least 100 MHz of Upper C-band spectrum, the

---

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 Proposed Rulemaking, *Upper C-band (3.98–4.2 GHz)* GN Docket No. 25-59, 90 Fed. Reg. 56076 (Dec. 5, 2025) (NPRM).

3 See NAB Comments (Apr. 29, 2025), NAB Reply Comments (May 30, 2025); Written *Ex Parte* Communication of NAB, GN Docket No. 25-59 (Aug. 5, 2025); Written *Ex Parte* Communication of NAB, GN Docket No. 25-59 (Nov. 12, 2025).

4 *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).

Commission should limit the auction to that amount and ensure that broadcast customers are fully protected and bear no harm throughout the transition.

The Commission should not auction off more than 100 MHz as that assuredly would cause material disruption to broadcasters. To the extent broadcasters are forced to transition because more than 100 MHz of the band is auctioned off, they should not bear the direct or indirect expenses of the transition; the costs, instead, should be borne by auction winners. As was the case in past transitions, if incumbent C-band users are transitioned to other bands or platforms, we urge the Commission to ensure that those users continue to have access to the unique capabilities inherent in C-band that they rely upon. The Commission also should plan for much longer timelines to transition incumbent services out of upper C-band. Unlike the transition out of lower C-band, the transition of incumbent services in the upper C-band will be dramatically more complex and expensive than lower C-band. Even with a planned transition, incumbents undoubtedly will bear some material inconvenience. On the other hand, a hasty transition would materially degrade and interrupt broadcast services. Fortunately, the Commission and industry learned important lessons from the previous transition that should inform how the Commission should best manage this transition.

II. THE UPPER C-BAND AUCTION SHOULD BE LIMITED TO 100 MHZ

The Commission should not auction off more than 100 MHz of the remaining C-band satellite downlink spectrum as any greater number would undoubtedly materially disrupt broadcast services and harm the public interest. SES, the major provider of C-band satellite services in the United States, has stated that most incumbent users can be "repacked" quickly into a reduced C-band if reallocation is limited to about 100 MHz.[5] By limiting the

[5] Comments of SES Americom, Inc., GN Docket 25-59, at 7 (Apr. 29, 2025).

auction to 100 MHz, the Commission would reduce transition costs, minimize disruption to incumbents, and expedite the availability of new spectrum for terrestrial uses.[6]

Even at a loss of 100 MHz of spectrum, there inevitably will be some disruption to incumbent users as a result of aggressive repacking. But repacking all or most users within C-band will be far less disruptive than forcing those users into other satellite spectrum or alternative platforms. Satellite operators and users have substantial, practical experience with the mechanisms necessary to accomplish repacking, such as filter installations and antenna repointing, and the success of the Lower C-band transition provides a proven roadmap. Conversely, relocation out of C-band presents far greater uncertainty, and the costs and time to transition will certainly be greater.

The Cost Catalog[7] from the Lower C-band auction, while now dated, remains instructive as a cost benchmark. During that transition, many earth stations required only filtering, repointing, and modest "inside" equipment upgrades, which could be completed within the "lump sum" reimbursement amount of $17,000 for a receive-only earth station with dual feeds.[8] In contrast, a C-band earth station that must move to Ku-band would often require construction of an entirely new earth station (including a second antenna, cabling, and supporting equipment) to allow for dual-illumination during the transition period. Such a

---

[6] Although the Commission has made clear that reallocation will involve at least 120 MHz to comply with the legislative requirement to auction no less than 100 MHz, the relocation of the 20 MHz guard band between terrestrial flexible use and satellite downlinks — from 3980-4000 MHz to 4080-4100 MHz — effectively limits the net loss of satellite downlink spectrum to 100 MHz. *See* NPRM ¶ 15.

[7] *3.7 GHz Transitional Final Cost Category Schedule of Potential Expenses and Estimated Costs*, GN Docket 18-122, DA-20-802A2, at 19 (July 30, 2020) (Cost Catalog).

[8] Cost Catalog at 19.

relocation would cost more than $400,000[9] – *approximately 23 times* as much as the cost of remaining in C-band. More striking still, this estimate is conservative. It assumes that a single Ku-band antenna can replace a single C-band earth station antenna, which won't be the case in many areas that are prone to rain fade. It also excludes the costs of dismantling and removing redundant antennas after transition and the costs of leasing additional property at constrained sites, such as rooftops, where space for a second antenna may be unavailable.

The Cost Catalog also provides estimated costs for converting from C-band satellite delivery to fiber, ranging from $55,000 to well over $1,000,000,[10] depending upon whether fiber exists at the site. Again, these estimates do not include the costs of dismantling and removing the existing earth station antenna. They also assume that the use of a single, non-redundant, fiber path is sufficient, which will not be the case. In practice, the costs for conversion to terrestrial fiber at many sites would need to be at least doubled to provide the path diversity necessary to achieve broadcast reliability.

Beyond the multi-billion-dollar costs associated with relocating incumbents out of C-band, auctioning more than 100 MHz would also substantially increase both the costs of radio altimeter replacement and the risk of interference to those systems. The FAA has stated that existing radio altimeter systems are 27 dB (500 times) less susceptible to interference from terrestrial operations below 4100 MHz than above that frequency.[11] Limiting the auction to 100 MHz, which would confine terrestrial operations to below 4080 MHz, would minimize the potential for interference to existing radio altimeter systems and could allow some aircraft to

---

9 *Id*. at 13, 28.

10 *Id*. at 9-10.

11 FAA, *Requirements for Interference-Tolerant Radio Altimeter Systems*, Notice of Proposed Rulemaking, FAA Docket 2025-5666, 91 Fed. Reg. 459 at Table 2 (FAA NPRM).

avoid equipment replacement.

III. INCUMBENTS SHOULD BE HELD HARMLESS IN THE TRANSITION

In past spectrum reallocations, the Commission has ensured that incumbent users are held harmless. That principle must apply here. First and foremost, any reallocation should be limited to 100 MHz. If broadcasters are nonetheless forced to vacate C-band because more than 100 MHz is auctioned, they must not bear any direct or indirect transition costs; the costs, instead, should be borne by auction winners. As in past transitions, the Commission must also ensure that any users relocated out of the C-band retain access to the unique capabilities of C-band — particularly very high short- and long-term reliability — that their operations require.

If more than 100 MHz is reallocated, the Commission also should anticipate much longer transition timelines than those associated with the "repacking" that occurred following the lower C-band auction. Unlike the prior transition — which involved moving users within C-band — relocation of incumbents out of Upper C-band would be vastly more complex, costly, and time-consuming. The Commission should anticipate extended dual-illumination periods, local zoning and permitting proceedings, and other logistical challenges necessary to avoid service disruption.

Transition of incumbents out of the lower C-band took about three years. That short timeframe was possible through relatively simple earth station modifications, which could be conducted with considerable flexibility with a single technician "truck roll." By contrast, if more than 100 MHz is auctioned, a shift out of C-band will be necessary, will involve far more advance planning, specialized labor, custom equipment, and will take far longer than three years to complete. In addition, satellite infrastructure is not commoditized; there are no warehouses full of equipment nor idle teams of technicians waiting by the phone. It is

unrealistic to assume that an Upper C-band transition could be completed on a comparable timeline.

The C-band's technical characteristics — particularly its reliability and wide coverage — cannot easily be replicated in other satellite bands. If replicating C-band service necessitates additional antennas, geographic site diversity, redundant delivery paths, or backup technologies, then those measures must be fully provided for and reimbursed. Below are some examples of measures needed to achieve comparable service using facilities outside of C-band:

A. Comparable Facilities for Incumbents Means Comparable Reliability and Coverage

As NAB previously noted, C-band provides uniquely high reliability and hemispheric coverage.[12] A transition from C-band to another satellite band or another platform must preserve these characteristics. Doing so may require geographically diverse Ku-band earth station sites with associated microwave circuits between them, to avoid rain attenuation affecting a single site. Or it may require construction of diverse fiber paths to avoid the substantial risk of fiber outages on any single path. Comparable facilities to C-band must mean comparable performance, both long- and short-term.

B. New Satellites and Earth Station Authorizations Are Necessary

The NPRM suggests[13] that no additional satellites or satellite uses (earth stations) will be authorized in the reallocated Upper C-band. Many incumbents have already been forced to modify satellite facilities for business reasons yet have been denied interference protection as a result. For example, the FCC has not permitted earth station registrations to be modified to

---

[12] See, *e.g.*, NAB Comments at 3.

[13] NPRM ¶ 19.

reflect relocations of existing satellite facilities due to a loss of lease. The FCC must not impede upgrades and modifications, including new satellite launches, that have been or will be necessary to maintain services. Although earth station registrations have been frozen, meaning these new or relocated earth stations are not eligible for interference protection, the C-band remains an active band. The Commission itself contemplated this outcome when it adopted an approach that it stated "will permit all incumbents to maintain comparable service for existing customers and to obtain future customers in the upper part of the band."[14] The investments made by both satellite operators and their customers in the Upper C-band should be accommodated consistent with the Commission's prior treatment of incumbent C-band operations. As was done previously,[15] the FCC should provide a limited opportunity to allow incumbent C-band users to update, correct, and modify their earth station facilities.

C. Economic Viability and Protection of Non-CONUS Users

The NPRM states[16] that the FCC will ensure continued provision of C-band services necessary to protect life and property outside CONUS, including in remote areas such as Alaska. Substantial reallocation (more than 100 MHz) would undermine that goal since the economics of providing limited service outside CONUS differ dramatically from providing service within CONUS. The FCC must support a subsidy or other mechanism to ensure that users outside CONUS are not disenfranchised.

---

[14] Lower C-band Order at ¶ 32.

[15] *International Bureau and Wireless Telecommunications Bureau Announce Guidance for 3.7-4.2 GHz Incumbent Earth Station Waiver Requests*, GN Docket 18-122, DA-20-1094 (Sep. 16, 2020).

[16] NPRM ¶ 20.

D. Reimbursement Must Be Rapid and Include Increased Operating Expenditures

Many C-band users reported delays of over two years to get reimbursed for costs consistent with the Cost Catalog. The Commission must streamline reimbursement processes or provide significant "up front" monies so that incumbents are not out-of-pocket millions of dollars for several years. Additionally, if incumbents are required to adopt alternative delivery technologies that impose higher ongoing operating costs to preserve service reliability, those increased costs flow directly from the reallocation and consequently should be eligible for reimbursement so that incumbents remain whole.

E. Reimbursement Eligibility Must Be Considered Holistically

Given the nature of C-band transmission, earth stations outside the contiguous United States may or may not need to migrate out of the C-band to maintain service. The Commission must take a holistic approach to reimbursement eligibility that accounts for these varied circumstances or otherwise face relocation expenses to continue receiving the same programming. For example, to support continued service in Upper C-band services, incumbents made investments in, among other things, new earth stations and the accompanying land – both of which are not limited to facilities located in the United States.[17] Such investments relied upon FCC assurances that the band would be available for broadcast applications following the Lower C-band auction. These investments must not be stranded.

IV. LESSONS FROM THE LOWER C-BAND TRANSITION

The Lower C-band transition provides several important and instructive lessons that should guide the Commission's approach here.

---

[17] Comments of the North American Broadcasters Association, GN Docket 25-59, at 2 (Nov. 12, 2025).

Existing Out-of-Band Emission (OOBE) Limits Have Been Insufficient. Existing OOBE limits on terrestrial systems operating in lower C-band have proven insufficient to prevent harmful interference to occasional use (OU) satellite receivers as well as to radio altimeters.[18] The base station conducted OOBE limit of -13 dBm/MHz adopted by the Commission in the prior proceeding[19] has failed to provide adequate protection of both radio altimeters[20] and OU satellite downlinks.[21] This is an unsurprising result and was predicted[22] by the multi-stakeholder group established by industry in response to the Commission's Order.[23] If satellite operations remain in any portion of the Upper C-band, the Commission must adopt more stringent OOBE limits.[24] NAB generally supports the FAA's proposal to rely on radiated

---

[18] *See, e.g.*, Reply Comments of PSSI Global Services LLC and PSSI International Teleport LLC, at 3-4 (May 29, 2025) ("During [the 2020] proceedings, PSSI voiced concerns about the impact these changes would have, and those concerns have since been validated. PSSI's ability to use C-band spectrum to serve its customers has been neither the same nor better. Rather, that ability has been both quantitatively and qualitatively degraded, with regular out-of-band power flux density and other interference issues at venues all over the United States, inhibiting the ability of licensed TES/TFE from receiving 4 GHz for satellite access, program continuity and insertion. Following the 2020 Report and Order, the provision of available C-band OU bandwidth was disrupted almost immediately. As transponders were progressively moved to shift programming services into the Upper C-band, OU inventory was naturally shifted as well, and planning for future customer services was greatly disrupted. Reduction and change in transponder inventory availability often changed with very short notice and often the information received about future availability was unreliable.").

[19] 47 C.F.R. § 27.53(l)(1).

[20] FAA NPRM at 463.

[21] Comments of PSSI Global Services LLC and PSSI International Teleport LLC, GN Docket 25-59, at 2 (Apr. 29, 2025).

[22] *See Ex Parte* filing, C-band Multi-Stakeholder Group, Technical Working Group #1, "Best Practices for Terrestrial-Satellite Coexistence During and After the C-band Transition," GN Docket 18-122, at 8 (Nov. 13, 2020).

[23] Expanding Flexible Use of the 3.7-4.2 GHz Band, Report and Order and Order of Proposed Modification, 35 FCC Rcd, at 2467 (2020) ("Lower C-band Order").

[24] Garmin International Comments at 8; *see also* FAA NPRM at 477 ("As was discussed in more detail in the preamble to the NPRM, the coming expiration of current voluntary commitments by wireless license holders to limit base station power level and out-of-band

emission limits, rather than conducted limits, but the proposed limit of -33 dBm/MHz requires further analysis of the compatibility with satellite receiving facilities.[25]

Preference for Single Transition. The transition of incumbents out of the lower C-band was accomplished in two phases, in part because of the need to launch additional C-band satellites and bring them into service. In many cases, this two-phase approach required multiple "truck rolls" to install different filters and caused unnecessary disruption to incumbent users. Most C-band users have neither the expertise nor the resources to modify their earth station installations. As a result, professional installers must be engaged to visit the site. Each visit must be coordinated with the user, which inevitably will lead to some disruption. To the extent that incumbent users can be repacked within a smaller C-band, NAB urges the FCC and satellite operators to pursue a single, coordinated transition.

Transition Plans Must Be Public. Transition plans must be transparent and publicly available so that affected parties can prepare and coordinate effectively. The Commission has proposed a deadline for filing Transition Plans followed by a comment period, but this process is effective only if the plans are publicly available. As was the case in the Lower C-band transition, the Commission should make clear that such plans will be publicly available for review and comment.

---

emissions in the Lower C-band spectrum (3.7–3.98 GHz) in 2028 and the upcoming FCC auction reallocating some or all of the Upper C-band spectrum (3.98–4.2 GHz) directly adjacent to the RA band are expected to exceed the ability of current avionics technology to mitigate the risk of spectrum interference and will create unacceptable risk to the NAS.").

[25] FAA NPRM at Table 7.

Interference Protection Must Be Enforceable. On the Commission's suggestion,[26] multi-stakeholder groups were formed by industry stakeholders and successfully developed sound technical recommendations and procedures for interference avoidance and resolution. But those recommendations went nowhere. There wasn't an enforcement mechanism to ensure those recommendations and procedures were implemented, and as a result, they essentially "sat on a shelf." If incumbents remain in Upper C-band, the Commission must establish enforceable requirements that compel wireless operators to cooperate in identifying and resolving interference, including shutting down facilities when necessary. As NAB commented previously, if the Commission again decides to "punt" on serious technical questions and recommends that industry establish a multi-disciplinary group to deal with post-transition interference issues, such recommendations must have "teeth," or they will be ignored.[27]

Uplink Frequencies Must Be Prioritized for the Remaining C-Band. NAB shares concerns raised by the North American Spectrum Alliance that the reduced C-band downlink spectrum has created significant challenges coordinating uplink frequency use with terrestrial microwave users.[28] In practice, the shared use of spectrum at 6 GHz, which for satellite users is directly paired with downlink spectrum at 4 GHz, creates coordination challenges that become worse as the amount of downlink spectrum is reduced. To the extent that some Upper C-band downlink spectrum is preserved for satellite use, the Commission should work with frequency coordinators to minimize new terrestrial links in the paired uplink spectrum. That

---

26 Lower C-band Order, *Op cit*.

27 NAB Comments at 8.

28 Reply Comments of the North American Spectrum Alliance, GN Docket 25-59, at 5 (May 28, 2025).

is, given the dependence that Upper C-band users have on the 6 GHz uplink band, the FCC should prioritize access for satellite users to continue Upper C-band satellite operations.

V. CONCLUSION

Although at least 100 MHz of Upper C-band spectrum will be auctioned, the Commission must ensure that incumbent broadcasters are fully protected and held harmless throughout the transition. Limiting the auction to 100 MHz and adopting the measures outlined above will significantly reduce disruption and preserve the continuity of vital broadcast services. The Commission must place the protection of incumbent users at the forefront of any decision regarding expanded use of the Upper C-band.

Respectfully submitted,

NATIONAL ASSOCIATION OF BROADCASTERS
1 M Street, SE
Washington, DC 20003
(202) 429-5430

Rick Kaplan
Nandu Machiraju
Alison Martin
Robert Weller

January 20, 2026