

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
Preliminary Cost Catalog	)	
for Upper C-band Incumbent Transition	)	

COMMENTS OF
THE NATIONAL ASSOCIATION OF BROADCASTERS

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I. INTRODUCTION AND SUMMARY

The National Association of Broadcasters (NAB)¹ submits its comments in response to the Wireless Telecommunications Bureau's Public Notice seeking comment on the Preliminary Cost Catalog for the Upper C-band transition.² NAB again emphasizes that Upper C-band is mission-critical to broadcasting and that the Commission must ensure that broadcast users forced from the band fully retain connectivity commensurate with the reliability, coverage, and capability inherent in C-band operations.³ NAB appreciates the Bureau's efforts to establish a comprehensive catalog of reasonable transition expenses and offers initial recommendations

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 *Wireless Telecommunications Bureau Seeks Comment on Preliminary Cost Catalog for Upper C-band Incumbent Transition*, GN Docket No. 25-59, Public Notice DA 26-1049 (Sep. 30, 2026) (Preliminary Cost Catalog).

³ See, e.g., NAB Reply Comments (Feb. 18, 2026).

to ensure that the catalog reflects the expected costs of relocating incumbent broadcast operations.

While the Lower C-band transition amounted to a *repack within* C-band, the Upper C-band transition will generally require a *relocation* of services *out of* C-band. Even facilities that continue to receive some programming in C-band may require substantial modifications to their existing receiving systems. Accordingly, the Cost Catalog should be structured to accommodate a comprehensive relocation of incumbent operations, rather than simply adapting the equipment categories and reimbursement amounts established for the previous repack.

While the Commission has recognized the fundamental differences between the Lower and Upper C-band transitions,⁴ the Preliminary Cost Catalog does not adequately address them. NAB urges the Bureau to:

- **Update equipment and service cost estimates** to reflect current market conditions, anticipated price increases, and the actual costs of specialized equipment and installation services;
- **Expand the catalog's equipment and service categories** to encompass the full range of modifications and replacement distribution arrangements necessary to maintain substantially the same service, including larger antennas, engineering and integration costs, and other expenses not encountered in the Lower C-band transition;

⁴ See *Upper C-Band (3.98–4.2 GHz); Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Report and Order, Order of Proposed Modification, and Order on Reconsideration, GN Docket Nos. 25-59 and 18-122, FCC No. 26-46 ¶¶ 110–125, (rel. July 24, 2026) (Upper C-band Order).

- **Reassess the lump-sum amounts and underlying methodology** to reflect the full cost of transitioning incumbent operations, rather than relying on incomplete categories or estimates derived from the previous repack;
- **Preserve flexibility to recover reasonable and necessary relocation expenses** that are not expressly identified in the catalog or that exceed its estimated ranges; and
- **Simplify certification and reimbursement procedures** by allowing incumbents to rely on previously accepted documentation and avoiding duplicative verification requirements.

A fulsome Cost Catalog will promote a fair, orderly, efficient transition and reduce unnecessary disputes and administrative expenses.

II. **COST RANGES SHOULD REFLECT CURRENT MARKET CONDITIONS AND ANTICIPATED COSTS**

The Preliminary Cost Catalog relies “in part” on equipment and service categories developed for the Lower C-band transition “with adjustments for inflation since that time.”⁵ NAB believes those adjustments often fail to adequately reflect actual cost increases since 2020, which may be due to factors other than inflation. During the intervening years, the costs of equipment, materials, labor, and installation services have been affected not only by inflation, but also by tariffs, supply-chain disruptions, and increases in commodity prices and other materials used in satellite infrastructure. These cost increases have not been uniform across equipment and service categories, so broad application of general inflation adjustments to the amounts specified in 2020 likely substantially underestimate the actual costs of the forthcoming transition and therefore are inappropriate. Specialized satellite

⁵ Preliminary Cost Catalog at 2.

receiving equipment, RF components, cabling, waveguide, and installation services have experienced cost increases that differ materially from general inflation. For example, the cost per pound of raw copper increased from \$2.16 in 2020 to \$6.79 in 2026, which is a 214 percent increase over six years, equivalent to about 21 percent per year.⁶ Moreover, cost increases for low-oxygen copper, which is the principal material used in the waveguides installed in satellite earth terminals and is often necessarily imported from outside the United States, have outpaced those of raw copper in part due to increased demand by the electric vehicle and semiconductor industries.⁷ Reliance on generalized inflation estimates rather than current, equipment-specific cost information risks systematically understating reasonable relocation expenses, contrary to the Commission's objective of ensuring that incumbents can transition while continuing to provide substantially the same service.⁸

The Bureau should also recognize that the transition will extend over several years and inflation has been and likely will continue to significantly increase costs over that period.⁹ As the Preliminary Cost Catalog is being developed during 2026, substantial equipment purchases and installation activities may not occur until 2028 or later, with the Commission's final transition deadline extending into 2031. Cost estimates based solely on 2026 prices may therefore substantially understate the expenses ultimately incurred. The Commission

⁶ *Copper Prices: Check Live & Historical Copper Spot Prices*, Money Metals (accessed Oct. 16, 2026), <https://www.moneymetals.com/copper-prices>.

⁷ *US Oxygen-Free Copper Market (2024-2029)*, Money and Markets (accessed Oct. 16, 2026), <https://www.marketsandmarkets.com/Market-Reports/geography/oxygen-free-copper-market/us>.

⁸ Upper C-band Order ¶ 99; 47 U.S.C. § 316(a)(1).

⁹ For example, the consumer price index increased 0.6% just during September 2026, increasing 3.7% over the preceding 12 months. See U.S. Bureau of Labor Statistics, *Consumer Price Index* (retrieved Oct. 15, 2026), <https://www.bls.gov/cpi/>.

must account for reasonable anticipated cost increases through the expected transition period. For illustration, an annual cost increase of 3 percent would result in cumulative increases of approximately 9.3 percent over three years and 12.6 percent over four years. As illustrated above in the case of waveguide materials, the actual increases for specialized equipment, materials, and labor could be 21 percent or more greater than these illustrative amounts, particularly for materials using elements not available from U.S. sources.

Equipment procurement lead times also warrant consideration. Feedhorns and other specialized equipment are not warehoused items and are often machined to order. The large quantities expected to be needed for the Upper C-band transition may require ten months or longer between ordering and delivery. Incumbents may therefore be required to commit to purchases well before installation, while facing uncertainty regarding future prices and availability. Accordingly, NAB recommends that the Bureau:

1. Reevaluate the proposed cost ranges using current equipment quotations and installation estimates rather than relying principally on inflation-adjusted 2020 amounts;
2. Incorporate reasonable projections of cost increases through the anticipated transition period;
3. Establish a mechanism for periodically updating catalog amounts, or otherwise recognizing documented, substantial increases in costs during the transition; and
4. Adopt sufficiently broad cost ranges to accommodate reasonable variations in equipment pricing, labor costs, site conditions, and procurement requirements.

These adjustments are particularly important because the Cost Catalog will establish a presumption of reasonableness for expenses within the specified cost ranges. Unrealistically low or compressed ranges would increase the uncompensated administrative burden on incumbents by requiring additional justification for expenses that are ordinary and necessary

to accomplish the transition. The resulting reimbursement process would be at odds with the Commission's objective of facilitating an efficient transition without imposing unreasonable relocation costs on incumbent operators.¹⁰

III. ADDITIONAL EQUIPMENT AND SERVICE CATEGORIES ARE NEEDED

The Lower C-band transition generally permitted incumbent earth stations to continue receiving programming using much of their existing equipment. For many facilities, the principal modifications involved installing waveguide filters to protect reception from interference from new terrestrial services. The Upper C-band transition will generally require substantially more extensive modifications, even at earth stations that continue receiving some services within C-band. For example, based on transition planning information provided by one satellite operator for a service remaining in C-band, an existing single-polarization receiving system will need to be modified to accommodate dual-polarization reception. This is because existing services that formerly operated on several transponders having the same polarization (*i.e.*, Vertical) will now be split across two transponders using both polarizations (*i.e.*, Vertical and Horizontal). Such modifications will include replacing an existing feedhorn with a dual-polarization assembly, installing multiple waveguide filters and low-noise block converters, adding additional coaxial cable or waveguide runs, expanding indoor RF distribution systems, and adding additional receivers. These changes are substantially more complex than installing a waveguide filter. They may require modification or partial disassembly of existing antenna assemblies, additional outdoor and indoor equipment, installation of a temporary antenna while transition work is underway, new cable pathways, and additions and modifications to existing receiver distribution arrangements. None of these

¹⁰ Upper C-band Order ¶ 154.

substantial costs are reflected in the Preliminary Cost Catalog.

Moreover, the costs of these modifications extend well beyond the purchase price of the individual components. Significant service-related expenses will be required. Engineering is required to determine the appropriate system configuration, identify compatibility issues, and ensure that the modified facility will provide reliable reception. Installation may require specialized personnel, special access equipment (e.g., lifts and cranes), and coordination to minimize service interruptions. Following installation, the system must be integrated, configured, and tested to verify satisfactory performance. Again, these substantial engineering and other service-related costs are absent from the Preliminary Cost Catalog.

Indeed, the Commission expressly anticipated that additional costs categories would be necessary for the Upper C-band transition given the migration of services to alternative distribution technologies.¹¹ The Preliminary Cost Catalog should therefore expressly recognize the full range of equipment and services associated with these in-band modifications, including:

- Dual-polarization feedhorn assemblies and associated antenna components;
- Additional waveguide filters, low-noise block converters, and related RF equipment;
- Additional coaxial cable, connectors, splitters, and indoor distribution and receiving equipment;
- Engineering, system design, and compatibility assessments;
- Installation labor, antenna access equipment, and site-specific construction;
- Receiver configuration, system integration, testing, and commissioning; and
- Temporary arrangements reasonably necessary to avoid interruption of existing services during the transition.

¹¹ *Id.* ¶ 154, n.524.

Not every earth station will require all these modifications. Nevertheless, the catalog should accommodate the range of configurations reasonably necessary to maintain substantially the same service following the transition. The Bureau should also recognize that installation costs may vary considerably among facilities depending on antenna size, mounting arrangements, accessibility, the number of antennas and receivers, and the complexity of existing distribution systems. Standardized equipment and labor allowances should not obscure these important site-specific differences.

The Preliminary Cost Catalog also omits FCC application filing fees associated with necessary modifications to incumbent earth station authorizations. Such fees are a direct and readily identifiable expense of the transition and were included in the Lower C-band Cost Catalog.¹² The Bureau should expressly include applicable FCC filing fees in the final Cost Catalog, consistent with the Commission's reimbursement framework and its treatment of these expenses in the prior transition.

IV. ACCOMMODATION FOR LARGER ANTENNAS, STRANDED INVESTMENTS, AND TERRESTRIAL RECOVERY TECHNOLOGIES

The most significant difference between the Lower- and Upper C-band transitions is that the latter will generally require broadcasters to move some or all their existing programming distribution operations out of C-band. The Commission has recognized that the small amount of remaining C-band capacity will be insufficient to accommodate all existing operations and that most services will need to migrate to Ku-band or other distribution technologies.¹³ Such migrations are fundamentally different from the installation of filters or

¹² See *Final C-Band Cost Category and Lump Sum*, GN Docket No. 18-122, Public Notice, 35 FCC Rcd 7967, 8016 (2020).

¹³ Upper C-band Order ¶¶ 24, 118.

other modifications to existing C-band receiving systems.

Migration to another satellite frequency band may require replacement or modification of receiving antennas, feed assemblies, RF electronics, receivers, cabling, and related distribution equipment. Depending on the alternative selected, the transition may also require new or modified antenna installations, site preparation, structural work, electrical improvements, and additional engineering and commissioning. Alternative satellite frequencies will also have different propagation characteristics. In particular, Ku-band reception is generally more susceptible to rain attenuation than C-band reception. Maintaining substantially the same level of service and reliability may therefore require additional measures, such as increased antenna gain, redundant receiving paths, or other reasonable engineering arrangements. For example, to overcome increased losses and decreased reliability associated with rain fade at Ku-band, larger diameter dish antennas may be needed. Such large diameter antennas at Ku-band have narrow beamwidths such that satellite analemma (figure-eight motion) will require autotracking at the receiving earth station. The addition of autotracking is a significant but necessary expense that is not included in the Preliminary Cost Catalog.

Similarly, migration to fiber or other terrestrial distribution technologies, including a terrestrial packet recovery system, may require new network connections, interface equipment, routers, decoders, monitoring systems, and modifications to existing broadcast facilities. Installation may involve construction, service provisioning, configuration, testing, and coordination among multiple service providers. The catalog should recognize reasonable one-time expenses necessary to establish these alternative distribution arrangements, including equipment, installation, engineering, integration, and testing. The Commission's existing treatment of ordinary ongoing operating expenses should not prevent reimbursement of

reasonable and necessary one-time costs of establishing a replacement distribution system.

The Bureau should also clarify the treatment of costs associated with decommissioning facilities and equipment rendered unnecessary by the transition. These may include removal and disposal of obsolete equipment, site restoration, and reasonable expenses directly associated with terminating or modifying existing facilities and service arrangements. NAB recognizes that not every stranded investment, contractual obligation, or decommissioning expense will necessarily qualify for reimbursement. Nevertheless, such expenses should not be categorically excluded merely because they were not encountered during the Lower C-band transition. The appropriate threshold for reimbursement is whether the expense is reasonable, necessary, and directly attributable to the relocation of incumbent operations, consistent with the Commission's reimbursement framework.

In sum, consistent with the Commission's determination that the Upper C-band transition will permit incumbent operators to continue providing substantially the same service, the Cost Catalog should reflect the cost of achieving that result, not merely the cost of replacing individual components of an existing C-band receiving system.¹⁴ The Preliminary Cost Catalog focuses principally on equipment used in the previous repack and fails to capture the actual scope of the forthcoming transition.

V. REASSESSMENT OF THE PROPOSED LUMP-SUM AMOUNTS AND METHODOLOGY

NAB supports providing incumbent earth station operators with the option to elect lump-sum reimbursement in lieu of reimbursement for actual relocation expenses. Properly structured, a lump-sum option can substantially reduce administrative burdens, provide

¹⁴ 47 U.S.C. § 316(a)(1); *PSSI Global Services, L.L.C. v. FCC*, 983 F.3d 1, 8-9 (D.C. Cir. 2020); Upper C-band Order ¶ 99.

greater flexibility in selecting replacement distribution technologies, and facilitate a speedy and efficient transition. However, the utility of the lump-sum option depends both on the categories included in each option and on the adequacy of the reimbursement amounts.

The Commission has directed that lump-sum payments reflect the average estimated reasonable costs of transitioning existing C-band service out of the affected spectrum, specifically costs associated with transitioning to Ku-band.¹⁵ The Commission expressly recognized that these costs are expected to exceed those associated with the earlier repack.¹⁶ To the extent that the proposed lump-sum amounts are derived from cost categories and estimates developed for the Lower C-band transition, when adjusted even for consumer inflation, they substantially understate the expenses necessary to accomplish the Upper C-band relocation. This underestimate of costs is compounded by the omission in the Preliminary Cost Catalog of equipment, engineering, installation, and other services necessary for alternative distribution arrangements. Even if individual catalog amounts were increased to reflect inflation, a lump-sum calculation based on an incomplete set of transition tasks cannot satisfy the Commission's directive that lump-sum amounts reflect the average estimated, reasonable costs of transitioning existing C-band service, including the costs of potential migration to Ku-band.¹⁷

Further, many earth stations operated by broadcasters have both transmit and receive capability and will require substantial modifications to continue to operate in those modes because of C/Ku-band cross-strapping. Cross-strapped satellite operations will require

¹⁵ Upper C-band Order ¶ 126, n. 449.

¹⁶ *Id.* ¶¶ 108, 120, 121.

¹⁷ *Id.* ¶ 126.

replacement of earth station exciters, high-power amplifiers, and other equipment as well as incurring substantial engineering and integration costs.

NAB therefore urges the Bureau to reassess both the amounts and methodology used to calculate lump-sum payments. The Bureau should ensure that the calculations:

1. Reflect the full range of reasonable transition activities, including migration to alternative distribution technologies;
2. Incorporate updated equipment and service costs, including reasonable anticipated cost increases during the transition period;
3. Account for differences in the complexity and configuration of incumbent earth station facilities including the impacts of cross-strapped satellite operation; and
4. Avoid systematically understating the costs of facilities that require more extensive modifications or replacement distribution arrangements.

The lump sum amounts specified in the Preliminary Cost Catalog also do not identify the line items applied to each category or the . . . quantity and probability assumptions, and weights based on its expected probability.”¹⁸ Without a full understanding of these factors, it is not possible to assess how and whether they adequately capture expected transition needs and costs. The Bureau must provide sufficient transparency regarding the assumptions and cost components underlying the lump-sum calculations so that affected incumbents can meaningfully evaluate whether the proposed amounts are reasonable.

Because a lump-sum election is irrevocable, operators must have a reasonable opportunity to evaluate the financial consequences of that election using reliable cost information. Inadequate lump-sum amounts will discourage participation in the option that is intended to streamline the transition or will leave incumbents electing the lump-sum responsible for substantial expenses that would otherwise qualify for actual-cost

¹⁸ Preliminary Cost Catalog at 22.

reimbursement.

VI. FLEXIBILITY FOR REASONABLE EXPENSES NOT EXPRESSLY IDENTIFIED

NAB appreciates that the Cost Catalog is not intended to provide an exhaustive list of every expense that may reasonably be incurred during the transition. The diversity of incumbent earth station facilities, together with the potential need to adopt alternative distribution technologies, makes it impractical to anticipate every necessary equipment configuration or transition activity.

Under the Commission's reimbursement framework, expenses falling within the catalog's estimated ranges are presumed reasonable. This presumption should facilitate reimbursement of routine expenses, but the absence of a particular expense from the catalog should not establish a presumption that the expense is unreasonable or ineligible. NAB urges the Bureau to confirm expressly that reasonable and necessary transition expenses outside the catalog remain eligible for reimbursement, subject to appropriate documentation and review. Moreover, the Bureau and its selected Clearinghouse must avoid imposing unnecessarily burdensome justification requirements for expenses that are not specifically enumerated. Incumbents should be permitted to establish the reasonableness and necessity of such expenses through customary business records, contractor quotations, independent engineering assessments, invoices, or other appropriate documentation.

The selected Clearinghouse should evaluate non-catalog claims in light of the actual technical requirements of the facility and the need to maintain *substantially the same service*, rather than mechanically comparing them to equipment categories developed for the Lower C-band transition. Similarly, where actual expenses exceed the upper end of the catalog range, the Clearinghouse should consider documented market conditions, site-specific requirements, and other relevant circumstances in determining whether the expense is reasonable. The

purpose of the Cost Catalog must be to facilitate efficient reimbursement, not to impose artificial limitations on otherwise reasonable and necessary relocation expenses.

VII. SIMPLE CERTIFICATION AND FILING PROCEDURES

NAB appreciates the Bureau's consideration of whether certification and filing procedures established for the Lower C-band transition should be repurposed or adjusted for the Upper C-band transition.¹⁹ NAB member experience with the earlier transition demonstrates that some documentation requirements imposed substantial administrative burdens and resulted in unnecessary expenses on incumbent operators.

For example, during the Lower C-band transition, earth station operators were required to provide certifications and supporting documentation concerning their existing facilities. In some instances, operators were subsequently required to provide photographic documentation of individual antenna feedhorns and other equipment because those components could not be verified using publicly available aerial imagery. Although obtaining such photographs may appear straightforward, the process often required rental of aerial lifts, specialized personnel, and partial disassembly of antenna systems. For operators responsible for hundreds of antennas, these requirements represent a substantial undertaking, involving considerable time and expense. Much of this information has already been collected and reviewed during the Lower C-band transition. Requiring operators to repeat the same verification procedures for facilities that have not materially changed would provide little additional benefit while imposing unnecessary costs on incumbents and increasing the administrative burden on the new Clearinghouse. NAB therefore recommends that the Bureau permit incumbent earth station operators to rely on certifications and supporting

¹⁹ Preliminary Cost Catalog at 3.

documentation previously accepted during the Lower C-band transition.

Earth station operators should be permitted to certify that the previously submitted information remains accurate, without repeating photographic inspections or other burdensome documentation procedures. Additional documentation should be required only where material changes have occurred, the earlier information is unavailable or insufficient for a distinct Upper C-band requirement, or specific discrepancies warrant further verification. Specifically, licensed antenna/site combinations that were previously certified and received reimbursement during the Lower C-band transition should presumptively satisfy corresponding existing-facility verification requirements for the Upper C-band transition, provided that no material changes have occurred. This approach would not eliminate the need to document new equipment, modifications, or expenses incurred during the Upper C-band transition, but it would avoid duplicative verification of facilities and equipment that have already been documented through the previous, FCC-supervised relocation process.

NAB also recommends that the Bureau direct the selected Clearinghouse to use existing Commission records and previously submitted transition documentation to the greatest extent practicable and to establish standardized electronic filing procedures that minimize duplicative submissions. Such measures would reduce administrative expenses for incumbent operators, simplify and speed claim processing, and lower the costs of administering the reimbursement program. They would also allow the Clearinghouse to devote its resources to reviewing actual relocation expenses rather than repeating verification activities completed during the previous transition.

VIII. CONCLUSION

The Upper C-band transition is fundamentally different from the Lower C-band repack. It will require many incumbent earth station operators to undertake extensive equipment

modifications and replacements or migrate to entirely different distribution technologies, all while maintaining substantially the same level of service and reliability. The final Cost Catalog adopted by the Bureau should reflect these differences in both its structure and its reimbursement amounts.

NAB urges the Bureau to update cost estimates to reflect current and anticipated market conditions; expand eligible cost categories to encompass the equipment, engineering, installation, and other services necessary for transition within or out of C-band; establish transparently derived and realistic lump-sum reimbursement amounts; preserve flexibility for reasonable and necessary expenses outside the catalog line items; and simplify certification and filing requirements by permitting reuse of previously accepted documentation.

A comprehensive and realistic Cost Catalog will facilitate an orderly and efficient transition, reduce unnecessary disputes and administrative expenses, and help ensure that incumbent broadcasters are not required to bear the reasonable costs of relocating their operations to accommodate new spectrum users.

Respectfully submitted,

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