

**Before the
Federal Communications Commission
Washington, DC 20554**

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

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

January 20, 2026

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The Open Technology Institute at New America and Public Knowledge (“OTI & PK”) hereby submit these comments in response to the Notice of Proposed Rulemaking in the above-referenced proceeding. As discussed below, our groups urge the Commission to propose changes that make all of the 3.98-4.2 GHz band available for more intensive licensed and shared use.

I. INTRODUCTION AND SUMMARY

The statutory mandate to clear and auction at least 100 megahertz in the Upper C-band creates an opportunity to authorize more intensive use of the entire 220 megahertz for a mix of use cases and broadband service providers that can spur competition, innovation and more seamless connectivity. OTI and PK urge the Commission to pursue this more ambitious goal by consolidating Fixed Satellite Service (FSS) incumbents—enabling a new flexible use allocation in the lower portion of the band—and by authorizing shared use by mobile satellite direct-to-device services in the upper portion of the band. This can be done in a manner that protects consumers and media outlets that rely on C-band for the distribution of high-quality video programming; that avoids requiring winning bidders in the auction to make windfall “acceleration payments” to satellite band incumbents that ultimately reduce the auction proceeds deposited into the U.S. Treasury; and that auctions a mix of licenses that include smaller license

areas, smaller channels, and an aggregation limit that together facilitate competition in the auction by smaller competitive and rural wireless broadband providers.

Our comments emphasize the following proposals:

First, while a reallocation and auction of at least 100 megahertz is required by law, the Commission has the discretion to protect the tens of millions of American households that continue to rely on FSS in the Upper C-band for high-quality video programming and other content to local broadcast stations, cable headends and radio stations. The reliability of these services must be sustained.

Second, while unique circumstances may have justified mandatory “acceleration payments” to satellite incumbents six years ago, these justifications are either nonexistent or unpersuasive today. While the 2020 C-Band auction rules ensured that the mandatory acceleration payments did not *directly* reduce the proceeds deposited in the U.S. Treasury, there is little doubt that it reduced the aggregate amount of the auction proceeds by billions of dollars.

Third, we propose that if the Commission decides to auction more than 100 megahertz, this additional sub-band should be auctioned at the county level in 10 megahertz blocks and at the same lower power level that characterizes Priority Access Licenses (PALs) in the Citizens Broadband Radio Service (CBRS). Moreover, we propose an auction-specific aggregation limit of 100 megahertz.

Finally, the Commission should determine the extent to which additional satellite service—and in particular direct-to-device mobile satellite service—can coexist and share the top portion of the band that is not auctioned for terrestrial mobile services. The more ubiquitous and seamless connectivity made possible by robust D2D services will benefit consumers far more than yet another increment of spectrum capacity for the three nationwide mobile carriers.

II. FSS INCUMBENTS SHOULD BE CONSOLIDATED HIGHER IN THE BAND WITHOUT RESORTING TO ACCELERATION PAYMENTS OR UNDULY DISRUPTING BROADCAST AND VIDEO SERVICES

OTI and PK urge the Commission to make all of the 3.98–4.2 GHz band available for more intensive licensed and shared use. As our groups explained in comments we filed in response to the Notice of Inquiry, the Commission can achieve this through a combination of consolidating Fixed Satellite Service (FSS) incumbents—enabling a new flexible use allocation in the lower portion of the band—and by authorizing shared use by mobile satellite direct-to-device services in the upper portion of the band.¹ While a further consolidation of FSS operations is required by statute to repurpose at least 100 megahertz of the band by auction, tens of millions of American households continue to rely on FSS in the Upper C-band for the distribution of high-quality video programming and other content to local broadcast stations, cable headends and radio stations. The reliability of these services must be sustained. We further believe that the “unique circumstances” that justified mandatory premium payments to satellite operators five years ago – thereby reducing proceeds to the U.S. Treasury by \$9.7 billion – may have been relevant at that time, but they are either nonexistent or unpersuasive today.

A. The Record Demonstrates That Incumbents Rely Heavily on the Band to Deliver Critical Content and Services

Clearing current fixed satellite operations off substantially more than the 100 megahertz required by law faces its greatest challenge not from the cost and time it will take to replace aircraft altimeters, but rather from the reliance of most Americans on Upper C-band for the transmission of live and high-quality broadcast, cable and data content. In its *2020 C-band R&O* the Commission acknowledged that C-band satellite operations are “critical to the delivery of

¹ See NOI Comments of OTI and PK, GN Docket No. 25-59 (Apr. 29, 2025).

television and radio programming ... and it is in the public interest to ensure that these services are not disrupted.”²

Tens of millions of American households continue to rely on FSS in the Upper C-band for the distribution of high-quality video programming and other content to local broadcast stations, cable headends, radio stations, and other use cases. According to the National Association of Broadcasters, “all the major U.S. television networks and many of the smaller ones rely on the Upper C-band for distribution of content to affiliate stations as well as to MVPD head-ends,” as do local radio stations.³ The cable industry similarly stated that “the *majority* of cable video programming is delivered via Upper C-band downlink transmissions to operators’ 35 million customers,” including more than 80% of the cable programming signals received by NCTA’s largest members, on average.⁴

Consumer reliance on FSS downlinks using the Upper C-band is greatest in rural and remote areas lacking established fiber infrastructure. In the *2020 C-band Report & Order*, the Commission concluded that “fiber ... would require extensive investment in order to replace existing C-band services.”⁵ In these areas, “new fiber deployment can be cost-prohibitive or logistically challenging and other wireless technologies are not full substitutes, leaving the Upper

² *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343, at ¶ 161 (2020) (*2020 C-Band R&O*).

³ NOI Comments of National Association of Broadcasters (NAB), GN Docket No. 25-59, at 2 (Apr. 29, 2025).

⁴ NOI Comments of NCTA—The Internet & Television Association, GN Docket No. 25-59, at 3 (Apr. 29, 2025), citing *Industry Data*, NCTA, <https://www.ncta.com/industry/insights/data/> (last visited Apr. 9, 2025) (tallying 35 million total cable video subscribers).

⁵ *2020 C-band R&O* at ¶ 51; *see also* Comments of the C-Band Alliance at 15, GN Docket Nos. 18-122 & 17-183 (Oct. 29, 2018) (explaining why fiber would “not match the C-band Downlink’s reliability, coverage, and cost-effectiveness,” in part because it would take “decades and billions of dollars” to reach locations the C-band serves).

C-band as the only viable media and content distribution option in many locations.”⁶ Extensive fiber penetration in these areas remains daunting today and will take many years to complete. And even where programmers or broadcasters do use fiber or FSS downlinks relying on Ku- or Ka-band frequencies for content distribution, “the availability of Upper C-band satellite capacity remains critically important to provide the [necessary] redundancy . . . and avoid a single point of failure.”⁷

Another alternative is the high-frequency FSS spectrum in the Ka- and Ku-bands above 10.7 GHz that are used both by geosynchronous (GSO) satellites and by Low Earth Orbit (LEO) satellites. However, fixed satellite downlinks at frequencies above 10 GHz are far more vulnerable to significant rain fade and service disruptions in areas with heavy rainfall and snow or high humidity.⁸ As the NAB explained, “weather dependent path attenuation [rain fade] . . . can be severe for significant time periods” for satellite transmissions relying on the Ku- and Ka-bands. This causes challenges, “particularly for downlinks, especially in parts of the country that have intense rainy seasons, like the southeast and Pacific northwest regions.”⁹

Finally, the Commission will need to bear in mind that not all current users of the Upper C-band are similarly situated. As the *NOI* stated, C-band satellites “primarily deliver programming content to television and radio broadcasters throughout the country, as well as providing telephone, data, and satellite communications services to customers on a contractual basis, including federal users.”¹⁰ As a result, even an ambitious proposal to substitute fiber for

⁶ *NOI Comments of NCTA*, GN Docket No. 25-59, at 2 (Apr. 29, 2025).

⁷ *Id.* at 9.

⁸ *See id.* at 7; *NOI Comments of NAB*, GN Docket No. 25-59, at 5-6 (Apr. 29, 2025).

⁹ *NOI Comments of NAB*, at 5 (Apr. 29, 2025).

¹⁰ *NOI* at ¶ 5.

today’s FSS distribution to cable headends and local broadcast stations using Upper C-band would need to identify an alternative for these other users as well, including federal agency systems.¹¹

B. Band Incumbents Must be Able to Provide Substantially the Same Service

Clearing satellite incumbents off all or substantially all of the Upper C-band faces legal obstacles in addition to the practical and policy considerations described just above. Section 316 of the Communications Act gives the Commission broad authority to modify licenses “if in the judgment of the Commission such action will promote the public interest, convenience, and necessity.”¹² As the Commission concluded in its *2020 C-Band R&O*, it has ample precedent and authority to consolidate an incumbent service—voluntarily or involuntarily—into a smaller portion of a band (as it did with FSS in 2020), to rearrange licensees within a band, or even to move an incumbent to a different band.¹³

However, the Commission cannot simply terminate an ongoing incumbent service, or even make a modification that amounts to a “fundamental change” to a licensee’s ability to continue its service.¹⁴ As the Commission acknowledged in its *2020 C-Band R&O*: “we agree

¹¹ For example, during the Lower C-band proceeding, ACA Connects proposed dedicating a portion of the auction revenues to build a fiber network as an alternative to FSS content delivery and to transition the transmission of all cable video programming to fiber, thereby making an additional 90 megahertz available for repurposing. The Commission explicitly rejected it on both legal and practical grounds. *See 2020 C-Band R&O* at ¶ 53; Letter from Ross Lieberman, Counsel to ACA Connects, Alexi Maltas, Counsel to CCA, and Elizabeth Andriou, Counsel to Charter, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (Jul. 2, 2019).

¹² 47 U.S.C. § 316. *See also California Metro Mobile Commc’ns, Inc. v. FCC*, 365 F.3d 38, 45 (D.C. Cir. 2004) (“Section 316 grants the Commission broad power to modify licenses.”).

¹³ *2020 C-Band R&O* at ¶¶ 111, 126-127.

¹⁴ *See 2020 C-Band R&O* at ¶ 129; *MCI Telecommunications Corp. v. AT&T*, 512 U.S. 218, 228 (1994) (holding that statutory “authority to ‘modify’ does not contemplate fundamental changes”).

that eliminating an incumbent space station operator’s right to transmit entirely would not be a modification.”¹⁵ On the other hand, “courts have repeatedly found that if a licensee can continue to provide substantially the same service, a modification to that license is not a fundamental change.”¹⁶ Accordingly, in its *2020 C-Band R&O* the Commission found that “the upper 200 megahertz of spectrum we are reserving for future FSS operations is sufficient to continue the services”¹⁷

As a result, a mandate that effectively forces customers of the current FSS incumbents to move to a different mode of transmission (e.g., fiber, fixed wireless) would run afoul of this limitation. On the other hand, the Commission can consider whether it would be feasible for the FSS incumbents—after a transition and with cost reimbursement—to provide substantially the same service from a different set of satellite frequency bands, or in a smaller portion of the same band that could be coordinated with an additional service (discussed further below).

What the Commission cannot do is share auction proceeds with FSS incumbents in return for clearing the band. The Commission’s *2020 C-Band R&O* explained that although the agency’s incentive auction authority is an exception to the rule requiring all proceeds to be deposited into the Treasury, that authority requires it to conduct a reverse auction among competing licensees (as it did with broadcast licensees in 2016). And inasmuch as the entire C-band (3700-4200 GHz) was a satellite band with access and use rights shared equally among any and all FSS incumbents, the Commission lacks the authority to conduct an incentive auction in

¹⁵ *2020 C-Band R&O* at ¶ 137.

¹⁶ *2020 C-Band R&O* at ¶ 129.

¹⁷ *Id.* at ¶ 130.

this context.¹⁸ The Commission also rejected T-Mobile’s proposal for an overlay incentive auction, concluding that it suffered from that same legal infirmity.¹⁹

C. There is No Justification for ‘Acceleration’ Payments to Band Incumbents that Reduce Auction Proceeds to the U.S. Treasury

If the Commission relies on its *Emerging Technologies* framework as authority to repurpose another large portion of the band by auction, OTI & PK urge the Commission to again require winning bidders to equitably share the reasonable costs of relocation, but to *not* mandate additional, so-called “acceleration payments” to the FSS incumbent licensees. To motivate a more expedited clearing process, the *2020 C-Band R&O* required winning bidders to pay up to \$9.7 billion in acceleration payments over and above the reimbursement of \$3.7 billion in actual relocation costs—and on top of the more than \$80 billion in winning bids deposited into the U.S. Treasury. We urge the Commission to be very reluctant to duplicate this framework in a manner that effectively uses the value of the public airwaves to give an unnecessary windfall to licensees that are being relocated because they are not making the highest and best use of the spectrum they occupy. The *2020 C-Band R&O* created a precedent that is rife with moral hazard, and which should be replicated only to serve compelling public interest objectives.

In its *2020 C-Band R&O*, it is notable that part of the Commission’s rationale for adopting a public auction—and rejecting a private sale of rights to the band by incumbent space station operators—was the acknowledgement that it would be inconsistent with the Commission’s auction authority and precedents to grant FSS incumbents new, far more valuable

¹⁸ *Id.* (“because space station operators have non-exclusive rights the full C-band nationwide, an incentive auction in this band would fail to satisfy the Section 309(j)(8)(G) requirement that at least two competing licensees must participate in the reverse auction.”)

¹⁹ *Id.* at ¶ 43 (“T-Mobile’s proposal exceeds our incentive auction authority”).

flexible use terrestrial licenses that they could then immediately transfer through privately-negotiated sales in return for a windfall.²⁰ And yet the \$9.7 billion in “acceleration payments,” although described as an incentive to achieve an accelerated timeline that would yield even larger benefits to mobile carriers eager to deploy 5G services, also effectively paid the FSS incumbents to *voluntarily* vacate spectrum they didn’t actually need to deliver the same services. But this is the same outcome the Commission asserted it had the clear authority to impose *involuntarily* under Section 316 and D.C. Circuit court cases upholding its *Emerging Markets* approach.²¹ Moreover, while the Commission had previously authorized “incoming licensees [to] offer ‘premium payments or superior facilities, as an incentive to the incumbent to relocate quickly,’” it had never mandated it.²²

The *2020 C-Band R&O* did articulate public interest considerations that the Commission decided justified acceleration payments at that time.²³ And the Commission described three types of market failure that it believed justified making the acceleration payments mandatory.²⁴ The

²⁰ See *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343, 2353–90, at ¶ 40 (2020) (*2020 C-Band R&O*). “Under the C-Band Alliance proposal, the Commission would be granting incumbent space station operators new flexible-use rights *solely* for the purpose of allowing the incumbents to sell those rights on the secondary market, without actually requiring them to meet any buildout requirements or initiate terrestrial service.” *Id.*

²¹ Although a transition greased with \$9.7 billion in incentive payments was more likely to occur on schedule, in a footnote the Commission stated that it would have provided for a five-year transition timeline with or without acceleration payments. *Id.* at ¶ 187, n. 498 (“While the acceleration payment should enable an earlier transition, the absence of an acceleration payment would not undermine any conclusion in this order supporting a five-year transition.”).

²² *Id.* at ¶ 184 [citation omitted].

²³ *Id.* at ¶ 185 (noting “the significant public interest benefits of clearing terrestrial, mid-band spectrum more quickly, which would bring next-generation services like 5G to the American public years earlier and help assure American leadership in the 5G ecosystem” and citing two economic studies).

²⁴ *Id.* at ¶ 186 (describing holdout, free rider and coordination problems).

Order then concluded that “[b]ased on the unique circumstances of the band,” it “would best serve the public interest, . . . to condition new licenses on making acceleration payments to satellite incumbents . . .”.²⁵

While the “unique circumstances” that justified mandatory premium payments to satellite operators six years ago may have been relevant at that time, they are all either nonexistent or unpersuasive today. First, unlike the lower C-band reallocation, Congress has now required the Commission to clear, reallocate and auction at least 100 megahertz as part of a spectrum pipeline intended to raise tens of billions of dollars to offset some of the cost of the One Big Beautiful Bill (OBBBA). Considering the bipartisan opposition to reports back in 2019 that the FCC might authorize a private market transaction for C-band, yielding an enormous windfall for satellite companies that never paid for the spectrum they share, the Commission should seek more clear legal authority before mandating premium payments.

This reluctance is further informed by the economic reality that although the 2020 C-Band auction framework ensured that the mandatory acceleration payments did not *directly* reduce the auction proceeds deposited in the U.S. Treasury, there is little doubt that it reduced the aggregate amount of the auction proceeds by billions of dollars. There is no reason to believe that winning bidders did not factor in the \$9.7 billion in “acceleration payments” the Commission forced them to pay directly to incumbents, reducing by a similar amount the bids in the public auction.

²⁵ *Id.* at ¶ 187.

Second, as the Commission observes in the *NPRM*, today’s “different circumstances” include “the timing of any adjacent band altimeter retrofits,”²⁶ which seem likely to delay mobile carrier use of most—if not all—of the Upper C-band for years, irrespective of acceleration payments to incumbents. This was not the case in 2020. Moreover, the coordination challenges highlighted in the *2020 C-Band R&O* should be greatly reduced. Now that SES has completed its acquisition of Intelsat, a single foreign-based satellite operator distributes more than 95% of all video programming that comes over C-Band satellite service in the United States.²⁷

Third, the Commission’s unprecedented rationale for acceleration payments in 2020 is far less pressing at a time when the growth of commercial mobile service data consumption is rapidly decelerating and the mobile industry has so much surplus 3 GHz spectrum that it is using it for an entirely different service: fixed wireless access (FWA). Our groups do not believe that freeing up more scarce mid-band spectrum for FWA is even *arguably* the highest and best use of the Upper C-band, let alone such an immediate imperative that taxpayers should foot the bill for premium payments to incumbents. WISPs primarily harness free-to-use CBRS and unlicensed 5 and 6 GHz spectrum to deliver a comparable FWA service. Mobile carriers could do the same. And even if the Commission considers licensed FWA to be a compelling use case for this band, a recent analysis by New Street Research reports that the big three wireless carriers now have capacity to serve up to 32 million FWA subscribers, more than double the industry’s current total of nearly 15 million subscribers accumulated over the past five years (primarily by Verizon and

²⁶ *NPRM* at ¶ 101.

²⁷ Kelly Hill, “FCC Approves SES-Intelsat Merger,” *RCR Wireless* (July 14, 2025), <https://www.rcrwireless.com/20250714/policy/fcc-ses-intelsat-merger>.

T-Mobile).²⁸ This suggests that freeing up more capacity to meet the remaining demand for FWA is not a short-term imperative.²⁹

More generally, the near-term outlook for mobile data demand is bleak. Recent reports indicate a steadily slowing growth rate in mobile data usage. For example, Ericsson’s annual mobility report shows that year-over-year mobile data growth declined globally from 80 percent in 2019 to 20 percent in 2025, with “video traffic expected to account for 76 percent of all mobile data traffic.”³⁰ An analysis by Cisco, which strips FWA data consumption from Ericsson’s overall tally, concludes that the growth rate for mobile data in North America is closer to 11%.³¹ In contrast, *indoor* wireless data consumption continues its rapid growth, both in absolute and relative terms, as the share of mobile device data traffic offloaded to Wi-Fi (and thus bypassing cellular networks) exceeds 80% in the U.S. and reportedly exceeds 90% in

²⁸ Masha Abarinova, “The Big 3 now have room for 32 million FWA customers,” *Fierce Wireless* (December 2, 2025) (citing New Street Research), <https://www.fierce-network.com/broadband/big-3-now-have-room-32m-fwa-customers>; Jeff Baumgartner, “2025 in review: FWA’s fangs stay sharp,” *Light Reading* (December 22, 2025) (noting a total 14.65 million subscribers at the end of Q3 2025), <https://www.lightreading.com/fixed-wireless-access/2025-in-review-fwa-s-fangs-stay-sharp>.

²⁹ The exception to this is on Tribal lands, where Tribal governments are deploying fixed wireless access and could use the Upper C-Band Tribal licenses to supplement their existing limited supply of licensed high-power spectrum (which consists solely of 2.5 GHz licenses made available to some tribes through the 2.5 GHz Tribal Licensing Window). But this is only a consideration if the Commission authorizes a similar TLW for the Upper C-Band.

³⁰ *Ericsson Mobility Report*, at 12 (Ericsson, November 2025), <https://www.ericsson.com/en/reports-and-papers/mobility-report/reports/november-2025>. See also Dennis Roberson and William Webb, *The End of Telecoms History* (2nd edition, 2025), at 60 (since 2013 “there has been a very clear and inexorable downtrend in [mobile] data growth...around 5–6 percent per year,” with no discernable “5G effect.”)

³¹ Mark Grayson, “Wi-Fi and Open Roaming,” Cisco presentation to Wireless Broadband Alliance, Wireless Global Congress (January 2025), <https://www.youtube.com/watch?v=Hbdf7gbcxyw>.

Europe.³² In fact, the economics of indoor use over shared spectrum allows Comcast, Charter, and Cox to support more than 18 million subscribers with a high-capacity *mobile* service that relies on Wi-Fi for nearly 90% of mobile device data use.³³

In short, mobile operators do not have the sort of short-term need for substantial new mid-band spectrum that they appeared to have five years ago. There is no longer a “beat China to 5G” imperative now that 5G is both fully built out and languishing with respect to both new consumer and enterprise demand. While it is possible that future 6G applications will create a new urgency to make mid-band spectrum available for mobile networks, that transformation is not likely before 2030 at the earliest. Moreover, last year’s sale of substantial low- and mid-band spectrum portfolios by EchoStar and UScellular to the three nationwide mobile carriers is also boosting their near-term needs to add capacity. Finally, while not available nationwide, the Commission’s upcoming AWS-3 auction will add substantial new spectrum capacity as well.

To be sure, our groups do not oppose auction conditions that serve important public interests (e.g., buildout requirements). Indeed, Section 309(j) explicitly states that considerations

³² See, e.g., Comments of Spectrum for the Future to NTIA, “Advancement of 6G Telecommunications Technology,” Docket 2024-001, at 2 (Aug. 21, 2024) (OpenSignal data for 2022 shows between 78% and 80% of Verizon, AT&T and T-Mobile mobile subscriber data traffic is carried by Wi-Fi networks); Dynamic Spectrum Alliance, “How Do Europeans Connect To The Internet?” at 4 (2022), (reporting that Wi-Fi represents about 90% of fixed broadband traffic in Europe), available at <https://tinyurl.com/DSA-EU-WiFiOffload>; Claus Hetting, “Report: US cable MVNOs extract big value from Wi-Fi offload,” *Wi-Fi NOW* (October 17, 2019), <https://wifinowglobal.com/news-and-blog/report-us-cable-mvnos-benefitting-greatly-from-wi-fi-offload/>.

³³ Kohposh Guda, “Comcast Lights Up Wi-Fi Boost Delivering Gig Speeds to Xfinity Mobile Customers on Millions of Wi-Fi Hotspots,” Comcast Blog (April 23, 2024), <https://tinyurl.com/2thfe979> (“90% of the mobile data traffic on Xfinity Mobile travels over Wi-Fi”). Charter reported 87% offload rates two years ago. Linda Hardesty, “Charter, Comcast Share Their Wi-Fi Networks for MVNO Services,” *Fierce Wireless* (May 10, 2023), <https://www.fierce-network.com/wireless/charter-talks-spectrum-connectx>.

of the amount of revenue raised in an auction must not supersede other public interest considerations.³⁴ Nonetheless, the Commission should be reluctant to impose “acceleration” or other premium payments on winning bidders or other band entrants that exceed actual and reasonable relocation costs.

III. AUCTION RULES SHOULD ENCOURAGE BROADER PARTICIPATION BY INCLUDING LICENSES FOR SMALLER AREAS, LOWER POWER AND WITH AGGREGATION LIMITS

The Commission proposes to auction “at least 100 megahertz of Upper C-band licenses in 20 megahertz blocks” and on a Partial Economic Area (“PEA”) basis.³⁵ The NPRM states that consistent with the band plan for the adjacent Lower C-band, this would “allow[] new flexible-use licensees to acquire 100 megahertz blocks by aggregating 20 megahertz sub-blocks through the competitive bidding process.”³⁶ This band plan is also consistent with the OBBBA mandate to auction not less than 100 megahertz for full power commercial licensed use cases.³⁷ For an auction that exceeds the 100 megahertz statutory limit, the Commission has the discretion to consider an overall band plan that will best serve the public interest.

Accordingly, the *NPRM* seeks comment on whether “a mix of channel sizes improve efficiency and flexibility for a wider variety of users in the band.”³⁸ Our groups propose that if the Commission decides to auction more than 100 megahertz, this additional sub-band should be auctioned at the county level in 10 megahertz blocks and at the same lower power level that

³⁴ 47 U.S.C. § 309(j)(7)(A).

³⁵ *NPRM* at ¶¶ 29, 33.

³⁶ *Id.* at ¶ 29.

³⁷ *Id.* at ¶ 14, citing the One Big Beautiful Bill Act of 2025, § 40002(b)(1).

³⁸ *Id.* at ¶ 30.

characterizes Priority Access Licenses (PALs) in the Citizens Broadband Radio Service (CBRS). Moreover, we propose an auction-specific aggregation limit of 100 megahertz.

By auctioning a mix of very large area (PEA) and smaller area (county) licenses, in smaller blocks and at lower power, the Commission can facilitate wider participation in the auction by smaller and more regional operators, including potentially rural carriers, WISPs and cable companies seeking to augment their CBRS deployments with additional spectrum. The Commission can also do so while not at all precluding any of the three nationwide carriers from either acquiring the 100 megahertz block of traditional full power licenses or from acquiring any of these smaller area, lower power licenses.

Including at least some licenses for auction at the county level is particularly important for expanding meaningful participation in the auction and for encouraging both greater competition and rural deployment. PEAs typically cover multiple counties and often attach heavily urbanized counties to neighboring counties that are rural or exurban in character.³⁹ For example, PEA 2 (Los Angeles) includes seven counties in addition to Los Angeles and stretches to the Nevada border.⁴⁰ Such large licensing areas are prohibitively expensive for local and typically smaller operators, particularly when such large areas do not fit their more local or targeted business model.

As the Competitive Carriers Association (CCA) explained in their NOI comments, “in general, smaller and rural providers prefer even smaller license sizes wherever possible, such as county-sized license areas” since this “enables smaller providers to obtain needed spectrum,

³⁹ See, e.g., *Wireless Telecommunications Bureau Provides Details About Partial Economic Areas*, Public Notice, GN Docket No. 12-268, DA 14-759 (rel. Jun. 2, 2014), Appendix B.

⁴⁰ *Id.* PEA 2 includes Kern, Los Angeles, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, and Ventura counties.

ensures more efficient use of spectrum, and allows larger providers to strategically combine licenses to fit their needs regardless of size.”⁴¹ Similarly, NCTA observed that “networks with lower power limits and smaller license areas can deliver higher aggregate network capacity with lower latency than old-style, high-power, high-site networks.”⁴²

An auction of more than the required 100 megahertz also creates an opportunity to include licenses with lower power limits, ideally with the same technical rules that apply to PALs in the CBRS band. The ability of county-sized and lower-power licenses to promote a wide variety of users and use cases was particularly evident in the CBRS auction. Auction 105 had 271 qualified bidders and 228 winning bidders that represented a wide variety of operators and use cases, including 70 different small-business WISPs, factory complexes (e.g., John Deere), utilities, cable companies, mobile carriers (Verizon acquired the largest number of PALs) and others. In contrast, auction 110 (3.45–3.55 GHz) and auction 107 (Lower C-band) were restricted to PEAs and had a total of 23 and 21 winning bidders, respectively. As expected, Verizon and AT&T won the vast majority of these enormous licenses.

Finally, with respect to an auction-specific aggregation limit, the Commission must consider its obligation to ensure that any new use will promote competition, consistent with Congress’s mandates to “promot[e] economic opportunity and competition,” “disseminat[e] licenses among a wide variety of applicants,” and “avoid[] excessive concentration of licenses.”⁴³ The recent shuttering of two of the very last facilities-based competitors to the three dominant national carriers—EchoStar and UScellular—has left holdings of mid-band spectrum

⁴¹ NOI Comments of Competitive Carriers Association, GN Docket No. 25-59, at 5 (Apr. 29, 2025).

⁴² NOI Comments of NCTA, GN Docket No. 25-59, at 15 (Apr. 29, 2025).

⁴³ 47 U.S.C. § 309(j)(3)(B).

and market share more concentrated than ever. As AT&T explained in its 2021 petition for a mid-band spectrum screen, anti-competitive foreclosure in the mid-band is “more likely to succeed today, and ... thus far more likely to arise” because “the industry has become ‘more concentrated’” and “every provider now needs access” to mid-band spectrum to “compete successfully in the 5G era.”⁴⁴ The Commission adopted band-specific aggregation limits for its auction of the 3.45 GHz band and the CBRS band (for PALs).⁴⁵ Our groups urge the Commission to do the same here, limiting any winning bidder to a maximum of 100 megahertz or less.

IV. THE UPPER PORTION OF C-BAND THAT REMAINS ALLOCATED TO FSS CAN BE EFFICIENTLY SHARED FOR DIRECT-TO-DEVICE MOBILE SATELLITE SERVICES

OTI and PK believe that now is the time to adopt rules that make more intensive use of the entire Upper C-band in a way that boosts capacity and competition among both terrestrial and non-terrestrial networks. While it may be infeasible to clear FSS operations off all or even most of the Upper C-band due to the likely disruption to broadcasting, cable and other current uses of the band, the Commission should determine the extent to which additional satellite service—and in particular direct-to-device mobile satellite service—can coexist and share the band. The diminishing demand for geostationary satellite (GSO) services as a conduit for broadcast, cable

⁴⁴ *AT&T Petition for a Rulemaking to Establish a Mid-Band Spectrum Screen*, WT Docket No. 23-319, at 19 (Sept. 1, 2021).

⁴⁵ *Facilitating Shared Use in the 3100-3550 MHz Band*, Second Report and Order, Order on Reconsideration, and Order of Proposed Modification, 36 FCC Rcd. 5987, ¶ 102 (rel. March 18, 2021); *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd. 3959, ¶ 117 (rel. Apr. 21, 2015).

and other content that relies on C-band further justifies additional allocations for shared use of the remaining FSS portion of the band for direct-to-device mobile satellite services.

Our groups believe that the more ubiquitous and seamless connectivity made possible by robust D2D services will benefit consumers far more than yet another increment of spectrum capacity for the incumbent mobile carrier networks.⁴⁶ Over the past year, direct-to-device (D2D) connectivity has emerged as a major opportunity to facilitate seamless connectivity, innovation and competition that promise to benefit consumers and enterprises alike. Direct-to-device services relying on MSS spectrum offer the potential for ubiquitous mobile connectivity *across all geographies*, with the quality of the connectivity limited only by the amount and kind of spectrum available for the satellite operators' use. An example is Globalstar, a MSS operator that has partnered with Apple to enable new iPhones to send and receive texts from virtually any location irrespective of cellular connectivity. Satellite operators also increasingly use both MSS and FSS spectrum to offer maritime, aviation and other vehicle-in-motion connectivity, and to power industrial IoT functions including remote asset tracking, agribusiness, sensing networks, and emergency services using satellite phones.

Regardless of how much of the Upper C-band can be repurposed for auction, any remaining FSS portion of the band will be lightly used no matter how vital it is to its video programming and other customers. A recent report from the bipartisan LEO Satellite Policy Working Group recommended that the statutory mandate to consolidate the Upper C-band “represents a timely opportunity to add MSS services to prime spectrum that is only lightly used,” noting as well that “since this spectrum [Upper C-band] is allocated globally for FSS, it

⁴⁶ See Michael Calabrese and Jessica Dine, *What 6G Should Be: Ubiquitous and Seamless Connectivity, Not Just Another 'G'*, presented at TPRC 2025 (Sept. 18, 2025), available via SSRN, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5501398.

could become a global MSS band as well.”⁴⁷ Authorizing additional shared use of the lightly-used FSS portions of the Upper C-band is also consistent with the Commission’s 2023 Policy Statement on Efficient Use of Spectrum for New Services.⁴⁸

In short, even if some combination of fiber and satellite services operating in Ku/Ka-band spectrum could eventually provide a complete substitute for the services of the current FSS licensees relying on C-band, it is more legally sound and practical to again consolidate and repurpose the lower portion of the band (e.g., 3.98–4.10 GHz), while maintaining an FSS allocation in 4.1–4.2 GHz together with one or more allocations for compatible shared use. We urge the Commission to consider adding a new MSS allocation in the Upper C-band rather than waiting years to see if rulemakings on sharing the narrow and currently occupied MSS bands in the 2 GHz range can coordinate in additional operators.

A. Adding a Mobile Satellite Service Allocation to All or a Portion of the Top 120 Megahertz of the Band Would Help to Fuel Direct-to-Device Connectivity

As OTI and PK stated in our NOI comments, more low-mid-band spectrum capacity for direct-to-device satellite services is critical to bridge the digital divide, support our nation’s first responders and, most importantly, to provide robust and reliable mobile broadband connectivity where and when terrestrial mobile networks are unavailable or inadequate.⁴⁹ While we acknowledge that the SpaceX acquisition of EchoStar’s MSS/AWS-4 spectrum and the

⁴⁷ LEO Satellite Policy Working Group, “Low Earth Orbit Satellites: Policies to Promote Spectrum Sharing, Foster Competition, and Close Digital Divides” (LEO Satellite Forum, October 2025), <https://www.newamerica.org/oti/wireless-future-project/reports/leo-satellites/>.

⁴⁸ *Principles for Promoting Efficient Use of Spectrum and Opportunities for New Services, Promoting Efficient Use of Spectrum Through Improved Receiver Standards*, 38 FCC Rcd 3682 (rel. Apr. 21, 2023).

⁴⁹ See NOI Comments of OTI and PK, GN Docket No. 25-59, at 17-18 (Apr. 29, 2025).

Commission’s world-leading authorization of Supplemental Communications from Space on designated terrestrial cellular bands is a big step in this direction, substantially more unfettered capacity is needed to enable mobile D2D services that can take full advantage of the potential to achieve ubiquitous connectivity, including in rural and remote areas.⁵⁰ The Upper C-band presents an immediate opportunity to advance this goal.

In 2020 the Commission declined to “complicate the repacking and relocation of FSS operations and earth station registrants” by authorizing any coordinated and shared use of the remaining 200 megahertz of the C-band that would remain in use by FSS incumbent space and earth stations. OTI and PK urge the Commission to strive to authorize more efficient and intensive use of all of the remaining 220 megahertz in the Upper C-band. In particular, and at a minimum, any portion of the band that remains allocated for FSS use should be considered for an additional authorization for shared use by MSS operators for direct-to-device (D2D) services. The Upper C-band remains globally allocated for downlink satellite services and not for terrestrial mobile use. The U.S. should be giving U.S.-based MSS/D2D operators, currently the world’s dominant providers, every opportunity to thrive both domestically and globally.

The record already shows substantial support from the satellite industry for expanding on the vital but declining use of the Upper C-band for satellite services. We agree with Omnispace LLC that narrowing what it calls the “D2D spectrum deficit” can “close the remaining coverage and capacity gaps” by enabling D2D services that connect the devices most consumers already have in their pockets, while also “unlocking data-intensive IoT capability embedded in vehicles, infrastructure, and objects in the environment to gather information and make intelligent

⁵⁰ While the parties here fully support SpaceX’s acquisition, it increases the need for additional spectrum to support competition in D2D services.

decisions.”⁵¹ SpaceX notes that Upper C-band “features significant capacity, wide contiguous bandwidth, and interoperability with 3GPP standards that can facilitate direct-to-cellular connectivity to standard handsets and other devices around the world . . .”⁵² Intelsat supported considering “more intensive use of a portion of the Upper C-band by other types of satellite services,” while Lynk recommended technical studies to the same end.⁵³ SES concurred with Lynk, but went further to state that it also “expects that alternative PNT operations in the Upper C-band would be consistent with the downlink FSS allocation and the Commission’s rules in this band.”⁵⁴

LEO satellite constellations offering mobile D2D connectivity clearly have enormous potential for innovation, competition and consumer welfare. Recent innovations by Globalstar, Apple, T-Mobile, AST SpaceMobile, SpaceX and others have demonstrated the potential for D2D connectivity, yet there are relatively few and narrow bands of low-frequency MSS spectrum available to expand on opportunities for convergent connectivity. LEO satellite operators are currently providing supplemental coverage to consumer handsets, primarily in rural, remote, or other areas where the terrestrial mobile signal is absent or weak. This supplemental and very narrowband coverage could improve over time as LEO satellite constellations grow and their technological capabilities increase. Satellite operators should not be

⁵¹ NOI Comments of Omnispace LLC, GN Docket No. 25-59, at 2-3 (Apr. 29, 2025). Omnispace proposes that “[a] significant portion of the Upper C-Band spectrum should be repurposed for Part 25 [MSS] and/or a newly created satellite flexible use service (“S-FUS”).”

⁵² NOI Reply Comments of Space Exploration Holdings LLC, GN Docket No. 25-59, at 4 (May 29, 2025).

⁵³ NOI Comments of Intelsat, GN Docket No. 25-59, at 10 (Apr. 29, 2025); NOI Comments of Lynk Global Inc., GN Docket No. 25-59, at 6 (Apr. 29, 2025).

⁵⁴ NOI Reply Comments of SES Americom Inc., GN Docket No. 25-59, at 14-15 (May 29, 2025).

hamstrung by effectively limiting new entrants to partnerships with mobile carriers, on exclusive-use mobile carrier bands, where satellite D2D service is at best ancillary and constrained. At a minimum, mobile enterprise use cases—including vehicle fleets, ships, workers, drones and robots—are likely to benefit from more robust MSS connectivity that can be relied upon at virtually any location.

A challenge, however, is that there are only a handful of relatively small MSS allocations. As two leading satellite spectrum experts opined in a recent white paper: “Finding large amounts of spectrum in bands suitable for direct-to-device services, which in practice means bands below 4 GHz, will be very difficult, particularly if D2D providers want to provide nationwide or global coverage.”⁵⁵ Moreover, today’s relatively narrow MSS assignments (e.g., in the Big LEO and L Band spectrum between 1.6 and 2.5 GHz) are occupied by incumbents that assert co-frequency sharing among MSS operators is infeasible.⁵⁶ Contentious debates are already pending over whether a rulemaking is needed to resolve if even these small allocations can be shared by entrants.⁵⁷

⁵⁵ Timothy M. Farrar and J. Armand Musey, “Spectrum for Emerging Direct-to-Device Satellite Operators,” at 11 (January 2025), available at <https://summitridgegroup.com/wp-content/uploads/D2D-White-Paper-SRG-TMF-Final.pdf>. “To date, the amount of terrestrial spectrum made available for D2D is limited and, in many cases, only covers a paired 5 MHz channel, and, in the case of AST’s testing agreement with Verizon, even less.” *Id.*

⁵⁶ See, e.g., Echostar Corp., Opposition to Petition for Rulemaking, *Revision of the Commission’s Sharing Plan to Encourage Productive Satellite Use of the 2 GHz Frequencies*, RM-11976, at 5-6 (filed March 12, 2024) (“co-frequency sharing between two different MSS systems [is not] technically feasible today”).

⁵⁷ See, e.g., Space Exploration Technologies Corp. Petition for Rulemaking, *Revision of the Big LEO Spectrum Sharing Plan to Encourage Productive MSS Use of 1.6/2.4 GHz Frequencies*, RM-11975 (Feb. 21, 2024); *Request for Comment on Petition for Rulemaking by Space Exploration Holdings, LLC, Regarding Revision of the Commission’s 1.6/2.4 GHz “Big LEO” NGSO MSS Sharing Plan*, RM-11975 (rel. March 26, 2024); Globalstar Application for Modification, ICFS File No. SAT-MOD-20230804-00192 (Aug. 4, 2023); Reply Comments of Space Exploration Holdings, LLC, RM-11975 (May 10, 2024).

Although a reallocation and rules for an auction in 2027 is the Commission’s first priority in this proceeding, our groups urge the Commission to consider as well whether and under what framework a portion or all of the Upper C-band can accommodate coordinated sharing among FSS and MSS operators and services. While our groups do not have the technical expertise or resources to answer that question at this time, SpaceX has asserted a basis for this belief, and will hopefully provide more specifics going forward. Amazon’s NOI comments similarly agreed that “next-generation satellite systems have demonstrated their ability to share spectrum efficiently with incumbents and co-primary users, including geostationary satellite systems, terrestrial networks, and federal users.”⁵⁸ Moreover, as Lockheed Martin observes, satellite networks have also “coexist[ed] seamlessly and for decades” with adjacent band radio altimeters, allowing more effective and less disruptive use of the frequencies at the very top of the C-band.⁵⁹

B. The Commission Should Authorize Secondary, Opportunistic Access for MSS Direct-to-Device Services Across the Entire Upper C-Band

Whether or not the Commission determines that MSS/D2D operators can share whatever portion of the Upper C-band that remains allocated for FSS, we believe the Commission should authorize MSS for secondary and opportunistic use in the 100 megahertz or more that is assigned by auction for terrestrial mobile use. A type of “use it or share it” authorization for D2D service in areas where the Upper C-band is not in use for mobile terrestrial service would help to facilitate more robust seamless connectivity, potentially across every geography and consumer handset irrespective of which MNO provides a user’s mainstay terrestrial service.

⁵⁸ NOI Reply Comments of Kuiper Systems LLC, GN Docket No. 25-59, at 3 (Apr. 29, 2025).

⁵⁹ NOI Comments of Lockheed Martin Corp., GN Docket No. 25-59, at 4 (Apr. 29, 2025).

While the three nationwide mobile network operators (MNOs) have extended at least basic outdoor coverage in most populated areas, vast geographies of rural, remote, mountainous and even agricultural areas lack even the most rudimentary cellular connectivity—and rarely, if ever, by all three major carriers. This is equally, if not more, true over large bodies of water, including the Great Lakes and coastal areas more than very a short distance off shore. Nor is there any rational expectation that MNOs will extend coverage to these areas.

In 2024, the Commission created a new option for D2D services by authorizing Supplemental Coverage from Space (SCS), a framework that permits satellite operators to partner with terrestrial mobile carriers and operate on a secondary basis in certain exclusively-licensed cellular bands.⁶⁰ SCS allows satellite providers to enable basic texting capacities on mobile devices outside mobile network coverage areas, or in other dead zones. With sufficient incentive and spectrum access, today’s rudimentary D2D connectivity, which is typically limited to basic texting, can advance over time to the quality of a 3G connection—one that would allow users in every part of the country to make calls and enable basic web browsing.

SCS, though, is balkanized and constrained in ways that limit potentially the far more robust D2D connectivity that MSS operators could provide. Unlike MSS, which operates on bands allocated globally for mobile satellite services, SCS requires permission from a mobile carrier (which holds an exclusive terrestrial license) and in practice is limited to the MNO’s subscribers. SCS can generally operate only in areas licensed to the mobile carrier, but not covered by the terrestrial network. Further, even the MNO’s subscribers will not have access to connectivity outside the MNO’s licensing area, while MSS can offer coverage globally.

⁶⁰ See *Single Network Future: Supplemental Coverage from Space*, Report and Order and Further Notice of Proposed Rulemaking, GN Docket No. 23-65, IB Docket No 22-271 (rel. March 15, 2024).

In contrast to this fragmentation, Globalstar’s D2D service, in partnership with Apple, is available on any compatible iPhone handset. However, Globalstar’s MSS spectrum assignments are very limited, constraining the capabilities of the iPhone’s back-up satellite connectivity. With more access to spectrum on even a secondary, opportunistic basis, D2D service providers could have greater ability and incentive to aggregate D2D-capable spectrum in rural, remote and other areas to offer at least 3G and even 4G functionality to mobile handsets, boats, agriculture, remote sensing, asset tracking and other enterprise IoT use cases in any location with a view of the sky.

V. CONCLUSION

Our groups urge the Commission to adopt changes that make all of the 3.98-4.2 GHz band available for more intensive licensed and shared use. The Commission can achieve this through a combination of consolidating Fixed Satellite Service (FSS) incumbents—enabling a new flexible use allocation in the lower portion of the band—and by authorizing shared use by mobile satellite services in the upper portion of the band to the greatest extent feasible.

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