October 30, 2025

FCC FACT SHEET[*]
Upper C-band (3.98-4.2 GHz)
Notice of Proposed Rulemaking – WT Docket No. 25-59

Background: This Notice of Proposed Rulemaking (Notice) seeks to expand the ecosystem for next generation wireless services in the 3.7–4.2 GHz band (C-band) by making as much as 180, and at least 100, megahertz of the 3.98–4.2 GHz band (Upper C-band) available for terrestrial wireless flexible use via a system of competitive bidding. This action is in furtherance of Congress' direction in the One Big Beautiful Bill Act (OBBB Act) to "complet[e] a system of competitive bidding not later than 2 years after the date of enactment of this Act for not less than 100 megahertz in the band between 3.98 gigahertz and 4.2 gigahertz."

What the Notice of Proposed Rulemaking Would Do:

- The Notice seeks comment on options for reconfiguring the Upper C-band in the contiguous United States ranging from 180 megahertz (3.98–4.16 GHz) to the congressionally mandated minimum of 100 megahertz (3.98–4.08 GHz) for terrestrial wireless use.
- The Notice seeks comment on how much Upper C-band spectrum—beyond the minimum 100 megahertz required by the OBBB Act—could be repurposed by incumbent fixed satellite service (FSS) space station operators and on how the transition could be effectuated if their existing customers relocate out of the C-band.
- Under any of the reconfiguration options under consideration, the Notice's baseline proposition is to apply the existing 3.7 GHz Service rules (applicable in the Lower C-band from 3.7–3.98 GHz) to any newly authorized terrestrial wireless operations. Any other rules and requirements, including those relating to the transition process, would be modeled to the greatest extent possible on those that applied to the Lower C-band transition.
- The Notice seeks comment on a range of issues associated with repurposing some portion of the Upper C-band, including:
    - Reallocation of the 4.0–4.2 GHz band;
    - Competitive bidding procedures for an eventual auction;
    - Licensing, operating, and technical rules for any new wireless services;
    - Transitioning incumbent FSS operations; and
    - Promoting co-existence with adjacent band radio altimeters.

[*] This document is being released as part of a "permit-but-disclose" proceeding. Any presentations or views on the subject expressed to the Commission or its staff, including by email, must be filed in GN Docket No. 25-59, which may be accessed via the Electronic Comment Filing System (https://www.fcc.gov/ecfs/). Before filing, participants should familiarize themselves with the Commission's *ex parte* rules, including the general prohibition on presentations (written and oral) on matters listed on the Sunshine Agenda, which is typically released a week prior to the Commission's meeting. *See* 47 CFR § 1.1200 *et seq*.

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

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

NOTICE OF PROPOSED RULEMAKING*

Adopted: [] **Released: []**

Comment Date: [[30 days after date of publication in the Federal Register]]
Reply Comment Date: [[60 days after date of publication in the Federal Register]]

By the Commission:

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Heading Paragraph #

* This document has been circulated for tentative consideration by the Commission at its November 20, 2025 open meeting. The issues referenced in this document and the Commission's ultimate resolution of those issues remain under consideration and subject to change. This document does not constitute any official action by the Commission. However, the Chair has determined that, in the interest of promoting the public's ability to understand the nature and scope of issues under consideration, the public interest would be served by making this document publicly available. The FCC's *ex parte* rules apply and presentations are subject to "permit-but-disclose" *ex parte* rules. *See, e.g.*, 47 C.F.R. §§ 1.1206, 1.1200(a). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules, including the general prohibition on presentations (written and oral) on matters listed on the Sunshine Agenda, which is typically released a week prior to the Commission's meeting. *See* 47 CFR §§ 1.1200(a), 1.1203.

I. INTRODUCTION

1. In July 2025, Congress adopted, and President Trump signed, the One Big Beautiful Bill Act (OBBB Act). The OBBB Act re-instituted the Commission's general auction authority and specifically directed the Commission to "grant licenses through systems of competitive bidding, before the expiration of the general auction authority. . . for not less than 300 megahertz, including by completing a system of competitive bidding not later than 2 years after the date of enactment of this Act for not less than 100 megahertz in the band between 3.98 gigahertz and 4.2 gigahertz."[1] Consistent with this directive, we propose today to further expand the ecosystem for next generation wireless services in the 3.7–4.2 GHz band (C-band) by making as much as 180, and at least 100, megahertz of the 3.98–4.2 GHz band (Upper C-band) available for terrestrial wireless flexible use via a system of competitive bidding.

2. To satisfy our congressional mandate and rapidly make more valuable mid-band spectrum available for terrestrial wireless services, we have identified several key goals for this proceeding. First, we propose to make additional spectrum in the Upper C-band available for new terrestrial wireless operations within the congressionally mandated timeframe. Next, as with the earlier 3.7–3.98 GHz (Lower C-band) transition, we seek to expeditiously transition incumbent operations in the

[1] Pub. L. No. 119-21, § 40002(b)(2), 139 Stat. 72 (2025) (One Big Beautiful Bill or OBBB Act). The law as passed does not have an express "short title" but while under debate commonly was known as the One Big Beautiful Bill Act.

Upper C-band in keeping with our *Emerging Technologies* precedent.[2] Finally, we look to reinforce a successful coexistence environment by facilitating the timely introduction of new, high-powered terrestrial wireless operations in the Upper C-band alongside a generational upgrade to radio altimeters that facilitates aviation safety through operations in the adjacent 4.2–4.4 GHz band that can safety coexist with wireless services. We therefore seek comment on proposals to enable terrestrial wireless operations in a segment of the 3.98–4.2 GHz portion of the C-band in the contiguous United States, to reserve no more than 20 megahertz as a guard band between those wireless operations and Fixed Satellite Services (FSS), and to generally apply the part 27 licensing and operating rules that presently govern wireless operations in the Lower C-band to new full-power commercial operations in the Upper C-band. We ask commenters to provide specifics on the costs and benefits of these proposals, and of potential alternatives, in addition to detailed technical analyses and other studies in support of their positions.

3. Accomplishing these tasks within the timeframe established by the OBBB Act will necessitate broad-based and proactive engagement from relevant industry stakeholders as well as our federal partners. To that end, we look forward to robust participation in this proceeding from entities with current and prospective in-band equities, including Upper C-band incumbents (e.g., FSS space and earth station operators, content providers, and other contractual customers that use FSS services), wireless carriers, and proponents of alternative distribution technologies. In terms of adjacent band equities, we note that the wireless and aviation industries are already engaged in ongoing discussions about how to promote the effective coexistence between any new terrestrial wireless operations in the Upper C-band and radio altimeters in the 4.2–4.4 GHz band.[3] We similarly anticipate continued dialogue and close coordination with the National Telecommunications and Information Administration (NTIA), the Federal Aviation Administration (FAA), and other federal stakeholders in areas of mutual interest. In particular, we expect that FAA will soon initiate a synchronized rulemaking to update its radio altimeter standards to complement our efforts to repurpose the Upper C-band. Although radio altimeters operate in an adjacent band (4.2–4.4 GHz), coordinated timing for these parallel processes will be important to provide certainty for stakeholders and to ensure a successful spectral coexistence environment. We believe that these collective efforts will help us meet the mandatory deadlines established by Congress and bring the benefits of expanded access to advanced wireless services, including 5G and, eventually 6G, to the American people.

II. BACKGROUND

A. Current Allocation and Use of the Upper C-band and Adjacent Bands

4. *Upper C-band*. The 4.0–4.2 GHz portion of the Upper C-band is currently allocated for non-federal use on a primary basis for FSS and Fixed Service (FS) links throughout the United States although FS operations were sunset in the contiguous United States throughout the entire C-band as part of the earlier Lower C-band transition.[4] Space station operators use 4.0–4.2 GHz nationwide to provide

[2] The Commission's *Emerging Technologies* framework has been relied on since the early 1990s to facilitate the swift transition of spectrum from one use to another. In the Lower C-band, it was used to require new 3.7 GHz Service licensees, as a condition of their licenses, to make "all necessary relocation and accelerated relocation payments before they are allowed to deploy in the spectrum made available for flexible use." *Expanding Flexible Use of the 3.7–4.2 GH Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343, 2391, 2415–22, paras. 112, 178–92 (2020) (*2020 C-band R&O*); *see, e.g.*, *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, ET Docket No. 92-9, First Report and Order and Third Notice of Proposed Rulemaking, 7 FCC Rcd 6886 (1992), clarified by Third Report and Order, 8 FCC Rcd 6589 (1993), modified on reconsideration, Memorandum Report and Order, 9 FCC Rcd 1943 (1994).

[3] *See* Letter from Dorothy B. Reimold, Vice President Civil Aviation, Aerospace Industries Assoc., *et al.*, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 25-59, at 1–2 (filed Aug. 21, 2025).

[4] 47 CFR § 2.106(c)(182), (c)(457); *id.* § 101.147(a)(8), (14), (25); *id.* § 101.803(d)(1); *see also 2020 C-band R&O*, 35 FCC Rcd at 2371, 2463–66, paras. 56, 321–28. Incumbent point-to-point FS operations in the entire C-band

(continued….)

space-to-earth signals (i.e., downlink) of various bandwidths to licensed transmit-receive, registered receive-only, and unregistered receive-only earth stations nationwide.[5] These signals primarily deliver programming content to television and radio broadcasters throughout the country, as well as telephone, data, and satellite communications services to customers, including federal users, on a contractual basis.[6] FS links remain in use in these frequencies outside the contiguous United States only.

5. The 3.98–4.0 GHz portion of the Upper C-band was reallocated as part of the earlier lower band transition in the contiguous United States, and is reserved as a guard band to protect adjacent incumbent operations in the remainder of the Upper C-band from potential harmful interference.[7] Outside the contiguous United States, these frequencies are allocated for and used by FSS and FS services.

6. *Lower C-band*. The adjacent Lower C-band from 3.7–3.98 GHz is allocated on a primary basis for non-federal Fixed and Mobile, except aeronautical mobile, services in addition to FS service within the contiguous United States, although as a practical matter only flexible use terrestrial wireless operations remain given the earlier sunset of FS uses.[8] Outside of the contiguous United States, the Lower C-band remains allocated for, and used by, FSS and FS services.[9]

7. *4.2–4.4 GHz*. The adjacent 4.2–4.4 GHz band is allocated in the United States on a primary basis for federal and non-federal Aeronautical Radionavigation Services for radio altimeters, which are aeronautical safety systems primarily used at altitudes under 2500 feet above ground level to measure aircraft height above terrain and obstacles in all phases of flight.[10] The band is also allocated worldwide on a co-primary basis for wireless avionics intra-communications systems; these systems provide communications over short distances between points on a single aircraft and are not intended to provide air-to-ground communications or communications between two or more aircraft.[11]

B. Procedural History

1. Lower C-band

8. In the *2020 C-band R&O*, the Commission authorized flexible use terrestrial operations in the 3.7 GHz Service from 3.7–3.98 GHz, reserved 3.98–4.0 GHz as a guard band, and migrated incumbent operations into 4.0–4.2 GHz throughout the contiguous United States.[12] To effectuate this transition and clear incumbent operations in the lower portion of the band, the Commission modified the licenses and market access authorizations of incumbent FSS operators, transmit-receive earth station

(Continued from previous page)
were sunset in the contiguous United States as of Dec. 5, 2023. *See 2020 C-band R&O*, 35 FCC Rcd at 2463–66, paras. 321–28; *see also* 47 CFR § 2.106(c)(182(iii)(B)); *id.* § 101.147(a)(8), (14), (25); *id.* § 101.803(d)(1).

[5] *Upper C-band (3.98 to 4.2 GHz)*, GN Docket No. 25-59, Notice of Inquiry, FCC 25-13, at 3, para. 5 (2025) (*Upper C-band NOI*).

[6] *Upper C-band NOI* at 3, para. 5*; see* NTIA Comments at 7–8.

[7] 3.98–4.0 GHz is allocated in the continental United States for non-federal use on a primary basis for FS and Mobile, except aeronautical mobile, Service, but there are no service rules established for that portion of the band. 47 CFR § 2.106(c)(182), (c)(457); *see also 2020 C-band R&O*, 35 FCC Rcd at 2371–72, para. 58.

[8] *2020 C-band R&O*, 35 FCC Rcd at 2370–72, paras. 54, 56–58; *see also* 47 CFR § 2.106(c)(182), (c)(457).

[9] Outside of the contiguous United States, authorized FSS and FS providers were allowed to continue operating throughout the entire 3.7–4.2 GHz band. *2020 C-band R&O*, 35 FCC Rcd at 2371, para. 56.

[10] 47 CFR § 2.106(c)(261) ("The use of the band 4200–4400 MHz by the aeronautical radionavigation service is reserved exclusively for airborne radio altimeters."); *see also id.* § 2.106(b)(438) ("Use of the frequency band 4200–4400 MHz by the aeronautical radionavigation service is reserved exclusively for radio altimeters installed on board aircraft . . . .").

[11] 47 CFR § 2.106(b)(436); *see also 2020 C-band R&O*, 35 FCC Rcd at 2484, para. 390.

[12] *2020 C-band R&O*, 35 FCC Rcd at 2370–72, paras. 54, 56–58; *see also* 47 CFR § 2.106(c)(182), (c)(457).

licensees, and FS licensees.[13] The Commission also assigned overlay licenses for the 3.7 GHz Service through an auction,[14] and adopted service rules requiring those licensees to comply with certain part 27 licensing, operating, and technical rules to encourage efficient use of the spectrum and protect incumbent users both in-band and in adjacent bands.[15]

9. The *2020 C-band R&O* required 3.7 GHz Service licensees to reimburse the reasonable relocation costs of eligible FSS space station operators, incumbent FSS earth station operators, and incumbent FS licensees, with a third-party Relocation Payment Clearinghouse (Clearinghouse) overseeing the cost-related aspects of the transition.[16] The practical aspects of the FSS transition were managed by the eligible space station operators who were required to submit public transition plans and work with a Relocation Coordinator to ensure a timely and orderly process.[17] The Commission established an ultimate deadline of December 5, 2025, by which the eligible space station operators were to complete the transition of FSS operations to the upper portion of the band, and also provided incentives for an accelerated clearing process by allowing eligible space station operators to voluntarily commit to relocate on a two-phased accelerated schedule, with a Phase I deadline of December 5, 2021, and a Phase II deadline of December 5, 2023.[18]

10. All five eligible space station operators elected accelerated relocation,[19] subsequently met the respective Phase I and II deadlines, and became eligible for the designated accelerated relocation payments.[20] As a result, the practical work of the transition was completed in 2023, and 3.7 GHz Service licensees are now providing 5G service using these frequencies in markets throughout the contiguous United States.[21] Residual cost-related aspects of the transition were effectively completed by June 2025,[22] and the relocation cost reimbursement program officially ended as of August 21, 2025.[23]

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[13] *2020 C-band R&O*, 35 FCC Rcd at 2394–408, 2463–66, 2488–89, paras. 124–53, 321–28, 409. The Commission also adopted a freeze on the filing of new or modified earth station applications across the 3.7–4.2 band, and it remains in place. *Temporary Freeze on Applications for New or Modified Fixed Satellite Service Earth Stations and Fixed Microwave Stations in the 3.7–4.2 GHZ Band*, Public Notice, 33 FCC Rcd 3841 (IB, PSHSB, WTB 2018).

[14] *2020 C-band R&O*, 35 FCC Rcd at 2353–90, paras. 22–109; *see also Auction of Flexible-Use Service Licenses in the 3.7–3.98 GHz Band for Next-Generation Wireless Services; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 107; Bidding in Auction 107 Scheduled to Begin December 8, 2020*, AU Docket No. 20-25, Public Notice, 35 FCC Rcd 8404 (2020); *Wireless Telecommunications Bureau Grants Auction 107 Licenses*, Public Notice, 36 FCC Rcd 10972 (WTB 2021); *Wireless Telecommunications Bureau Grants Additional Auction 107 Licenses*, Public Notice, 37 FCC Rcd 4505 (WTB 2022).

[15] *2020 C-band R&O*, 35 FCC Rcd at 2376–90, 2467–86, paras. 71–109, 332–97; *see generally* 47 CFR pt. 27. As discussed *infra* in Section III.D Coexistence with Adjacent Band Radio Altimeters, the 3.7 GHz Service licensees subsequently made temporary, voluntary commitments to adjust certain technical parameters in support of both full power deployments across the Lower C-band and the coexistence environment with adjacent band radio altimeters.

[16] *2020 C-band R&O*, 35 FCC Rcd at 2415–52, paras. 178–283; 47 CFR §§ 27.1411–27.1422.

[17] *2020 C-band R&O*, 35 FCC Rcd at 2452–61, paras. 284–317; 47 CFR §§ 27.1411–27.1413. As noted *supra*, incumbent point-to-point FS operations in the entire C-band were sunset in the contiguous United States as of Dec. 5, 2023. *See 2020 C-band R&O*, 35 FCC Rcd at 2463–66, paras. 321–28; *see also* 47 CFR § 2.106(c)(182(iii)(B)); *id.* § 101.147(a)(8), (14), (25); *id.* § 101.803(d)(1).

[18] *2020 C-band R&O*, 35 FCC Rcd at 2408, 2413–22, paras. 155, 168–192; 47 CFR § 27.1412(a), (b)(1)–(2).

[19] *Wireless Telecommunications Bureau Announces Accelerated Clearing in the 3.7–4.2 GHz Band*, GN Docket No. 18-122, Public Notice, 35 FCC Rcd 5517 (WTB 2020); 47 CFR § 27.1412(c).

[20] *See generally 2020 C-band R&O*, 35 FCC Rcd at 2415–45, paras. 178–249; 47 CFR §§ 27.1412(b), (g); *id.* § 27.1422.

[21] *See, e.g.*, Press Release, Verizon, Verizon Turbo Charges its 5G Network With the Addition of More Spectrum (Aug. 14, 2023), https://www.verizon.com/about/news/verizon-5g-network-addition-more-spectrum.

2. 2025 Upper C-band Notice of Inquiry

11. In February 2025, the Commission issued the *Upper C-band NOI*, which outlined the successful lower band transition, the current state of allocations and services across the C-band, and the Commission's interest in exploring the potential for new services in the Upper C-band.[24] The Commission solicited feedback on the appropriate parameters for additional opportunities for robust connectivity in the Upper C-band and asked commenters to identify how much spectrum in the Upper C-band could be repurposed for new uses.[25] The Commission also sought comment on whether and how to amend the U.S. Table of Frequency Allocations to facilitate new opportunities in the band, either by aligning the Upper C-band's allocations with those in the Lower C-band, or by taking a different approach.[26] The *Upper C-band NOI* asked questions about the structure and mechanics of a potential transition to new operations in the Upper C-band, including whether to utilize some or all of the aspects of the Lower C-band transition, as a means to manage the practical and financial aspects of any new transition effort.[27] The Commission also sought input on the appropriate service and technical rules for any new operations in the Upper C-band.[28]

12. The *Upper C-band NOI* asked Upper C-band incumbents—including FSS space and earth station operators, content providers, and other contractual customers (including federal users) that rely on FSS services—about how the introduction of new services might affect their current and future operations in the band.[29] The *Upper C-band NOI* also noted the proximity and sensitivity of the radio altimeter operations in the 4.2–4.4 GHz band, the steps that were taken to protect those operations in the *2020 C-band R&O*, and technical work that has been undertaken in the years since that action.[30] Recognizing the successful coexistence environment that has been fostered between the 3.7 GHz Service and radio altimeters at 4.2–4.4 GHz, we requested further information regarding advancements in radio altimeter resiliency and sought comment on appropriate technical and service rules that would further promote coexistence in light of potential new operations in the Upper C-band.[31]

13. The *Upper C-band NOI* generated a wide array of comments from incumbent FSS operators, 3.7 GHz Service licensees and other wireless providers, content providers and other FSS customers, as well as aviation interests with adjacent band equities. Since that record closed earlier this year, the OBBB Act passed and was signed into law.[32] The proposals set forth in this *NPRM* have been specifically developed to fulfill the directive in the One Big Beautiful Bill Act to auction for terrestrial use not less than 100 megahertz of the Upper C-band; we look forward to commenters refining their

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[22] On June 4, 2025, the Wireless Telecommunications Bureau granted the Clearinghouse's request to wind down and cease operations on or about June 30, 2025. *See Expanding Flexible Use of the 3.7 to 4.2 GHz Band; 3.7–4.2 GHz Band Transition Clearinghouse Dispute Referrals and Appeals*, GN Docket No. 18-122, WT Docket No. 21-333, Order, DA 25-477 (WTB June 4, 2025).

[23] *Wireless Telecommunications Bureau Announces Wind Down of the 3.7–4.2 GHz Relocation Payment Clearinghouse*, GN Docket No. 18-122, WT Docket No. 21-333, Public Notice, DA 25-735 (WTB Aug. 21, 2025).

[24] *Upper C-band NOI* at 1–3, paras. 1–6.

[25] *Upper C-band NOI* at 3–4, para. 8.

[26] *Upper C-band NOI* at 4, para. 9.

[27] *Upper C-band NOI* at 6, paras. 13–14.

[28] *Upper C-band NOI* at 6, para. 15.

[29] *Upper C-band NOI* at 4–5, para. 10.

[30] *Upper C-band NOI* at 5, paras. 11–12.

[31] *Upper C-band NOI* at 5, paras. 11–12.

[32] OBBB Act.

earlier *NOI* input in response to the specific proposals in this *NPRM*, and with our new legislative remit in mind.

3. The One Big Beautiful Bill Act

14. In July 2025, as part of the One Big Beautiful Bill Act, Congress reinstituted the Commission's general authority to grant licenses through systems of competitive bidding through September 2034 and established a path forward for the eventual repurposing of 800 megahertz to be licensed through competitive bidding, including at least 500 megahertz for full power commercial licensed use cases.[33] The One Big Beautiful Bill Act also specifically directed the Commission to "grant licenses through systems of competitive bidding, before the expiration of the general auction authority for not less than 300 megahertz, including by completing a system of competitive bidding not later than 2 years after the date of enactment of this Act for not less than 100 megahertz in the band between 3.98 gigahertz and 4.2 gigahertz."[34] In light of this direction, we are quickly moving forward to fulfill our Congressional mandate and seek comment below on reconfiguration alternatives for the Upper C-band which are designed to meet this goal.

III. NOTICE OF PROPOSED RULEMAKING

A. Reconfiguration and Allocation of the Upper C-band

1. Reconfiguration Options

15. In this *NPRM*, we seek comment on options for reconfiguring the Upper C-band in the contiguous United States ranging from 180 megahertz (3.98–4.16 GHz) to the congressionally mandated minimum of 100 megahertz (3.98–4.08 GHz) for terrestrial wireless use. Under any approach we may adopt within this range, we propose that the remainder of the Upper C-band would be used for repacked FSS operations with a guard band of no more than 20 megahertz. For clarity, we note that the total amount of spectrum ultimately repurposed will include both the spectrum designated for auction as well as any guard band. Thus, to auction 100 megahertz, that amount plus any guard band (e.g., 20 megahertz, for a total of 120 megahertz) will need to be repurposed. Our consideration of the optimal amount of spectrum to repurpose for terrestrial wireless use will take into account what may be achievable in terms of the further transitioning of in-band incumbent FSS operations in the contiguous United States. Notably, incumbent satellite operators serving a majority of the C-band earth stations in CONUS have already stated that it is possible for them to repurpose at least 100 megahertz of the Upper C-band for terrestrial wireless use.[35] We seek comment on how much Upper C-band spectrum—beyond the minimum 100 megahertz required by the OBBB Act—could be repurposed by incumbent FSS space station operators and on how the transition could be effectuated if their existing customers relocate out of the C-band.[36]

16. Our ultimate decision regarding the amount of spectrum to repurpose will depend on a variety of additional factors. Specifically, we seek input on the economic benefits and costs of repurposing spectrum for terrestrial wireless and how that value could be affected by the amount of

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[33] OBBB Act, § 40002(b)(1); *see also* 47 U.S.C. § 309(j)(11).

[34] OBBB Act, § 40002(b)(2).

[35] *See, e.g.*, SES Americom, Inc. Comments at 5–8 ("If these trends are predictive, then it may be possible for incumbent satellite operators to clear a portion of the band (potentially up to 100 megahertz) in a shorter timeframe—with the right incentives for them to manage the rapid clearing and repacking and robust incumbent cost-reimbursement mechanisms."); Letter from Brian D. Weimer, Counsel to Eutelsat Communications S.A., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 25-59, at 1–2 (filed July 28, 2025) (Eutelsat July 28, 2025 *Ex Parte* Letter) ("Eutelsat anticipates it could clear as much as 130 MHz . . . within three years of a Commission order with two additional C-band satellites and all services compressed.").

[36] *See infra* Part III.C.2.a. Clearing Space Station Operations; Part III.C.2.b Clearing Earth Station Operations.

spectrum that is ultimately repurposed and the clearing timeline. We also will consider the capabilities of adjacent band radio altimeters which are expected to undergo upgrades that will further enhance their signal rejection capabilities and bolster the existing successful spectral co-existence environment to facilitate a further repurposing in the Upper C-band.[37] We believe that appropriately balancing all these factors will help to further our ultimate goal of repurposing the maximum amount of spectrum for terrestrial mobile broadband as the United States continues to deploy 5G systems and plan for future 6G systems.

17. Under any of the reconfiguration options under consideration, our baseline proposition is that we would apply the existing 3.7 GHz Service rules to any newly authorized terrestrial wireless operations. Any other rules and requirements, including those relating to the transition process, would be modeled to the greatest extent possible on those that applied to the Lower C-band transition. We recognize, however, that certain modifications may be necessary in light of our experiences during that earlier transition with the Lower C-band, with the unique parameters of the Upper C-band and the instant transition in mind, and as a result of the band reconfiguration option we ultimately adopt. We seek comment on these reconfiguration options generally, and specifically as to how each of the topics addressed throughout this *NPRM* might be impacted depending on the amount of spectrum that we ultimately repurpose. We also seek input on how these reconfiguration options might be adjusted or better tailored to the specific circumstances of the Upper C-band, and how they might impact existing and future incumbent services, both in-band and in adjacent bands.

2. Reallocation of the 4.0–4.2 GHz Band

18. To implement any reconfiguration proposal in effectuating the One Big Beautiful Bill Act's Upper C-band directive, we propose to add a primary, non-federal mobile, except aeronautical mobile, allocation to whatever portion of the 4.0–4.2 GHz band we reconfigure in the contiguous United States.[38] We also propose to remove the FSS allocation from the reconfigured portion of the Upper C-band in the contiguous United States.[39] This proposal would harmonize the allocations in the immediately adjacent Upper C-band with those in the 3.7–4.0 GHz portion of the band and thus make a wider band of contiguous mid-band spectrum available for next generation wireless services. As noted *supra*, before its 2020 reallocation, the Lower C-band had exclusive non-federal allocations for FSS and FS, as does 4.0–4.2 GHz today.[40] In the *2020 C-band R&O*, the Commission added a primary non-federal mobile, except aeronautical mobile, allocation to the 3.7–4.0 GHz band in the contiguous United States.[41] The Commission also reserved a guard band at 3.98–4.0 GHz to protect adjacent operations.[42]

19. We propose to closely align the allocations across the C-band for reasons similar to those that prompted the Commission's 2020 reallocation of 3.7–4.0 GHz.[43] Mid-band spectrum is crucial for

[37] *See infra* Part III.D Coexistence with Adjacent Band Radio Altimeters.

[38] OBBB Act, § 40002(b)(2).

[39] *2020 C-band R&O*, 35 FCC Rcd at 2371, para. 56.

[40] *2020 C-band R&O*, 35 FCC Rcd at 2370, para. 54.

[41] *2020 C-band R&O*, 35 FCC Rcd at 2370, para. 54; 47 CFR § 2.106.

[42] *2020 C-band R&O*, 35 FCC Rcd at 2371–72, para. 58.

[43] *See 2020 C-band R&O*, 35 FCC Rcd at 2370–72, paras. 54–58. Section 303(y) provides the Commission with authority to provide for flexibility of use if: "(1) such use is consistent with international agreements to which the United States is a party; and (2) the Commission finds, after notice and opportunity for public comment, that (A) such an allocation would be in the public interest; (B) such use would not deter investment in communications services and systems, or technology development; and (C) such use would not result in harmful interference among users." 47 U.S.C. § 303(y).

next-generation wireless broadband service due to its favorable propagation and capacity characteristics.[44] As before, we believe that adding a primary non-federal mobile, except aeronautical mobile,[45] allocation to whatever portion of the 4.0–4.2 GHz band that is eventually repurposed in the contiguous United States will foster more efficient and intensive use of mid-band spectrum and facilitate investment in next generation wireless services.[46] Recognizing that FS operations have been sunset in those areas, we further propose to retain exclusive non-federal allocations for FSS and FS in whatever portion of that band is *not* repurposed for terrestrial commercial wireless use in the contiguous United States. Given the complexity and short time frame for implementing our Congressional directive here, and with potential impacts on incumbent in-band and adjacent band services in mind, we propose to not allow any additional satellite or other uses in the Upper C-band at this time. We seek comment on these proposals.

20. Although we propose to remove the FSS allocation from the reconfigured portion of the Upper C-band in the contiguous United States, we also propose to preserve the status quo regarding FSS and FS allocations and operations outside of the contiguous United States, which would be permitted to continue in the entire 3.7–4.2 GHz band.[47] This proposal would ensure the ongoing provision of C-band services necessary to protect life and property—including national security, telehealth, E911, and education services—for which C-band service may be the only option available, such as in remote areas of Alaska.[48]

21. We seek comment on the above reallocation proposals. What are the benefits and potential drawbacks of adding a mobile allocation, except aeronautical mobile, in some portion of the 4.0–4.2 GHz band in the contiguous United States? Do our reallocation proposals strike the proper balance between enabling more intensive flexible use of the band and reserving spectrum for existing incumbent FSS operations which—based on information previously provided by certain C-band satellite operators—are declining in use over time?[49] What are the potential economic and operational/service impacts of our reallocation proposals, and of any potential alternatives that commenters may advance? Commenters are encouraged to provide specific data in support of any views on existing or future service trends that may inform the reconfiguration approach we adopt, and the resulting allocations that will be needed to implement that decision.

B. Auction of Upper C-band Spectrum for Flexible Use

1. Competitive Bidding Procedures

22. Consistent with our statutory mandate to grant licenses in the 3.98–4.2 GHz band through a system of competitive bidding, and to complete competitive bidding for such licenses within two

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[44] *2020 C-band R&O*, 35 FCC Rcd at 2370, para. 55.

[45] As before, the proposed approach would harmonize the Upper C-band's allocations with international allocations. *See 2020 C-band R&O*, 35 FCC Rcd at 2370, para. 55. The International Table of Frequency Allocations also has a mobile allocation worldwide throughout the entire C-band, with the limitation that in the Americas, Southeast Asia, Australia, and New Zealand, the mobile allocation excludes aeronautical mobile. 47 CFR §§ 2.104, 2.106.

[46] *2020 C-band R&O*, 35 FCC Rcd at 2370, para. 55.

[47] *2020 C-band R&O*, 35 FCC Rcd at 2371, para. 56.

[48] *2020 C-band R&O*, 35 FCC Rcd at 2371, para. 56.

[49] *In the Matter of Applications of SES S.A. and Intelsat S.A. For Consent to Transfer of Control of Licenses and Authorizations*, Memorandum Opinion and Order, DA 26-614, SB Docket No. 24-267 (July 11, 2025) (*SES/Intelsat Merger Order*) ("In particular, the Applicants argue that media customers have several alternative distribution options, including terrestrial fiber networks, which have become increasingly competitive with their satellite-based services; and argue that changing video consumption patterns among consumers have reduced demand for traditional linear television service, and therefore, the Applicants' programming distribution services as well. The Applicants assert that their revenues from media services have declined due to increased competition and reduced demand for their services.").

years,[50] we propose to conduct an auction of licenses in this band in conformity with the general competitive bidding rules set forth in part 1, subpart Q, of the Commission's rules.[51] As we have done in all recently conducted Commission spectrum auctions, we propose to employ the part 1 rules governing competitive bidding design, designated entity preferences, unjust enrichment, application and certification procedures, payment procedures, reporting requirements, and the prohibition on certain communications between auction applicants.[52] Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its part 1 general competitive bidding rules in the future.[53] We seek comment on whether any of those rules would be inappropriate or should be modified for an auction of licenses in the Upper C-band.[54]

23. We also seek comment on the specific implementation of designated entity preferences available in the Upper C-band.[55] Consistent with every recent Commission auction of 5G-capable spectrum, including the Lower C-band, we propose to offer small business bidding credits to eligible entities, subject to the cap of no less than $25 million, as described in section 1.2110(f)(2)(ii) of the Commission's rules.[56] If we decide to offer small business bidding credits, we seek comment on how to define a small business. In all auctions of licenses likely to be used to provide 5G services in a variety of bands since the part 1 schedule of bidding credits was updated in 2015,[57] we have adopted bidding credits for the two larger designated entity business sizes provided in the Commission's part 1 standardized schedule of bidding credits.[58] We propose to use the same definitions here. Accordingly, we propose to define a small business as an entity with average gross revenues for the preceding five years not exceeding $55 million, and a very small business as an entity with average gross revenues for the preceding five years not exceeding $20 million.[59] A qualifying "small business" would be eligible for a

[50] *See* 47 U.S.C. § 309(j)(1). As noted *supra*, Congress has mandated that the Commission "complet[e] a system of competitive bidding not later than 2 years after the date of enactment of this Act for not less than 100 megahertz in the band between 3.98 gigahertz and 4.2 gigahertz." OBBB Act, § 40002(b)(2).

[51] *See* 47 CFR §§ 1.2101–1.2114.

[52] *See*, *e.g.*, *2020 C-band R&O*, 35 FCC Rcd at 2372–76, paras. 59–70; *Enhancing National Security Through the Auction of AWS-3 Spectrum Licenses, et al*., GN Docket Nos. 25-70, 25-71, 13-185, Report and Order, FCC 25-39, para. 22 (rel. Jul. 25, 2025) (*2025 AWS-3 R&O*) ("The Commission has repeatedly found that application of its part 1 competitive bidding rules . . . to individual services serves the public interest.").

[53] *See 2020 C-band R&O*, 35 FCC Rcd at 2373, para. 61.

[54] Consistent with our longstanding approach, we will initiate a public notice process to solicit input on certain details of auction design and the auction procedures.

[55] While the Commission is not required to adopt bidding credits for a particular service, the part 1 rules provide that the Commission may do so by adopting small business or rural service provider bidding credits in the service-specific rules for a band. 47 CFR § 1.2110(f)(1).

[56] 47 CFR § 1.2110(f)(2)(ii).

[57] *See Updating Part 1 Competitive Bidding Rules et al*., WT Docket Nos. 14-170 and 05-211, GN Docket No. 12-268, RM-11395, Report and Order, Order on Reconsideration of the First Report and Order, Third Order on Reconsideration of the Second Report and Order, Third Report and Order, 30 FCC Rcd 7493, 7529, para. 85 (2015) (continuing practice of evaluating the definition of a small business on a service-by-service basis) (*Updating Part 1 Report and Order*) (modified by Erratum, 30 FCC Rcd 8518 (WTB 2015)); 47 CFR § 1.2110(f)(1).

[58] 47 CFR § 1.2110(f)(2)(i)(A)–(C) (defining small business entities using average gross revenues thresholds of $4 million, $20 million, and $55 million); *see also id.* § 27.1301(a), (c)(1) (600 MHz Service); *id*. § 27.1601(a) (3.45 GHz Service); *id*. § 27.1402(a) (3.7 GHz Service); *id*. § 27.1219(a)–(b) (Educational Broadband Service); *id*. § 30.302(a)–(b) (Upper Microwave Flexible Use Service); *id*. § 96.30(a), (c)(1) (Citizens Broadband Radio Service).

[59] The Commission recently amended the standardized schedule of bidding credits provided in section 1.2110(f)(2)(i) to define small businesses based on average gross revenues for the preceding five years. *See 2025*

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bidding credit of 15% and a qualifying "very small business" would be eligible for a bidding credit of 25%, subject to the use of a bidding credit cap specified in section 1.2110(f)(2)(ii) of the Commission's rules.[60] We also seek comment on whether the characteristics of the frequencies in the Upper C-band and our proposed licensing model suggest that we should adopt different small business size standards and associated bidding credits than we have in the past. Commenters advocating different standards and/or bidding credits are encouraged to identify specific circumstances and characteristics of licenses in the Upper C-band and to provide specific, data-driven arguments in support of their proposals.

24. Additionally, we propose to offer rural service providers a designated entity bidding credit for licenses in the Upper C-band. Consistent with the findings in the *Updated Part 1 Report and Order* and our approach in other bands where the spectrum is likely to be used to provide 5G services, including the Lower C-band,[61] we propose to offer a 15% bidding credit to any eligible rural service provider, as defined in section 1.2110(f)(4)(i) of the Commission's rules, and subject to the bidding credit cap of no less than $10 million, as described in section 1.2110(f)(4)(ii) of the Commission's rules, that has not claimed a small business bidding credit.[62] Our past experience with the rural service provider credit indicates that the existing part 1 rural service provider bidding credit achieves an appropriate balance of statutory obligations that the Commission is charged with pursuing, while sufficiently enabling rural service providers to compete for spectrum licenses.[63] Commenters addressing this proposal should consider what details of licenses in the band may affect whether rural service providers will apply for them. Those advocating for any alternatives should provide data-driven arguments in support of their proposals.

2. Licensing and Operating Rules

25. In the *2020 C-band R&O*, the Commission adopted licensing, operating, and technical rules to encourage efficient use of spectrum resources and promote investment in the Lower C-band while protecting incumbent users both in-band and in adjacent bands.[64] Building on the Commission's prior decision to license terrestrial mobile operations in the 3.7–3.98 GHz portion of the C-band under our part 27 flexible use rules,[65] we propose to adopt similar licensing and operating rules that provide the flexibility to align new licenses in the Upper C-band with existing licenses in the Lower C-band already governed by part 27.[66] By providing a consistent framework for development and implementation across

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AWS-3 R&O at para 32. The small business bidding credits for the 3.7 GHz Service also define small businesses based on average gross revenues for the preceding five years. *See* 47 CFR § 27.1402.

[60] 47 CFR § 1.2110(f)(2)(ii).

[61] *See Updating Part 1 Report and Order*, 30 FCC Rcd 7538, para. 108; *see also 2020 C-band R&O*, 35 FCC Rcd at 2376, para. 69; *Promoting Investment in the 3550–3700 MHz Band*, GN Docket No. 17-258, Report and Order, 33 FCC Rcd 10598, 10647, para. 90 (2018); *2025 AWS-3 R&O* at paras. 35–37.

[62] 47 CFR § 1.2110(f)(4)(i) (bidding credit of 15 percent for applicants meeting the requirements for being designated as a rural service provider); *id*. § 1.2110(f)(4)(ii). To be eligible to receive a rural service provider bidding credit, an applicant must meet the requirements set forth in part 1. *Id.* § 1.2110(f)(4)(i). An applicant eligible for both a small business bidding credit and a rural service provider bidding credit may only receive one of the two credits. *See Updating Part 1 Report and Order*, 30 FCC Rcd 7538, para. 108; *accord* 47 CFR § 1.2110(f)(2)(i), (4)(i).

[63] *2025 AWS-3 R&O* at paras. 35–37.

[64] *2020 C-band R&O*, 35 FCC Rcd at 2376–90, 2467–86, paras. 71–109, 332–397; *see generally* 47 CFR part 27.

[65] *See* 47 CFR part 27.

[66] Several commenters to the *Upper C-band NOI* support applying the same service rules that were used in the Lower C-band. *See, e.g.,* Ericsson Comments at 4 ("The FCC can further maximize efficient use of the Upper C-band by aligning the wireless service rules that will apply with the Part 27 flexible-use service rules that apply to the Lower C-band. Adopting Part 27 rules for the Upper C-band will allow for operations in this spectrum to become a

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the Upper and Lower C-band, we aim to harmonize the entire repurposed band for mobile terrestrial use with the expectation that it will yield significant economies of scale and accelerate the deployment of cutting-edge technologies, such as 5G and eventually 6G. We invite comment on this approach.

26. We also seek to afford new terrestrial wireless licensees the flexibility to align licenses in the Upper and Lower C-band with licenses in other spectrum bands also governed by part 27 of the Commission's rules. We therefore propose that new licensees in the Upper C-band comply with licensing and operating rules that are applicable to all part 27 services, including those rules relating to the assignment of licenses by competitive bidding,[67] flexible use,[68] regulatory status,[69] foreign ownership reporting,[70] compliance with construction requirements,[71] renewal criteria,[72] permanent discontinuance of operations,[73] partitioning and disaggregation,[74] and spectrum leasing.[75] We seek comment on this approach and ask commenters to identify any aspects of our general part 27 service rules that should be modified to accommodate the particular characteristics of the Upper C-band.

27. In addition, we seek comment on whether to adopt service-specific rules in several areas for the Upper C-band, or integrate the Upper C-band into those rules already applicable to the Lower C-band, including eligibility,[76] license term,[77] performance requirements,[78] renewal term construction obligations,[79] and other licensing and operating rules. In addressing these issues, commenters should discuss the costs and benefits associated with these proposals and any alternatives that commenters propose.

a. Band Plan

28. *Block Size.* For the Lower C-band, the Commission issued licenses in 20 megahertz sub-blocks to provide sufficient flexibility for interested bidders to tailor their decisions based on the anticipated clearing costs and accelerated relocation payment obligations associated with a particular amount of spectrum or geographic license area.[80] To facilitate the provision of 5G services, the Commission defined uniform block sizes of 100 megahertz that would run across the entire Lower C-band and allowed new flexible-use licensees to acquire 100 megahertz blocks by aggregating 20

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natural extension of deployments in the Lower C-band, creating important opportunities for equipment development and network deployments at scale."); *see also* Competitive Carriers Association Comments at 4; Verizon Comments at 9; Qualcomm Comments at 5–6; Verizon Reply at 2; CTIA Reply at 11; WIA Reply at 4–5.

[67] 47 U.S.C. § 309(j); 47 CFR §§ 1.2101–1.2114.

[68] 47 U.S.C. § 303(y); *see also* 47 CFR §§ 1.2106, 27.2, 27.3.

[69] 47 CFR § 27.10.

[70] 47 U.S.C. § 310; 47 CFR § 27.12.

[71] 47 CFR § 27.14(k).

[72] 47 CFR § 1.949.

[73] 47 CFR § 1.953.

[74] 47 CFR § 1.950.

[75] 47 CFR §§ 1.9001 *et seq*.

[76] 47 CFR § 27.12.

[77] 47 CFR § 27.13.

[78] 47 CFR § 27.14.

[79] 47 CFR § 1.949.

[80] *See 2020 C-band R&O*, 35 FCC Rcd at 2377–78, paras. 72–74.

megahertz sub-blocks through the competitive bidding process.[81] In doing so, the Commission ensured that Lower C-band spectrum was licensed in sufficiently wide bandwidths to enable 5G deployments.[82] Moreover, the use of 20 megahertz sub-blocks provided sufficient flexibility for manufacturers and licensees to tailor application of the band to suit future needs, especially when considering that LTE can be made to coexist within or adjacent to 5G operations.[83] Consistent with Lower C-band, we propose to issue at least 100 megahertz of Upper C-band licenses in 20 megahertz blocks, to facilitate the ability of licensees in both portions of the band to further aggregate mid-band spectrum they need for 5G deployment and enable complementary deployments across the entire band. We invite comment on this proposal. Correspondingly, we also seek comment on whether a block size approach similar to Lower C-band would be appropriate for the wireless technologies that are likely to be deployed in Upper C-band and whether 20 megahertz continues to be the appropriate block size to accommodate a wide range of terrestrial wireless services and provide sufficient bandwidth to support 5G and eventually 6G services.

29. Alternatively, would a mix of channel sizes improve efficiency and flexibility for a wider variety of users in the band? Should we consider smaller block sizes to create opportunities for a wider variety of entities to compete for licenses at auction? For example, in the *3.45 GHz Band 2d R&O*, where only 100 megahertz was available for auction, the Commission determined that smaller 10-megahertz blocks would best serve our dual goals of making spectrum available to a diverse array of entities while also enabling licensees to obtain sufficient spectrum rights for deploying wideband networks.[84] Or should we license the Upper C-band in larger block sizes (e.g., 50–100 megahertz)? Should the specific transition mechanism ultimately adopted by the Commission dictate the appropriate block size for the Upper C-band? What types of services or applications do prospective licensees envision providing using this spectrum? How does the choice of channel block size impact the ability to deliver these services and applications in terms of sufficient capacity as well as network robustness? Commenters who support an alternative approach should support their proposals with detailed cost benefit analyses.

30. *Spectrum Block Configuration*. In the *2020 C-band R&O*, the Commission found that an unpaired spectrum block configuration provides licensees the flexibility necessary to increase the capacity of their networks and make the most efficient use of Lower C-band spectrum.[85] We propose to adopt the same unpaired spectrum block configuration to ensure continuity, spectral efficiency and maximum flexibility for licensees across the Upper and Lower C-band. We invite comment on this approach and on any alternate proposals, including auctioning paired spectrum blocks. Commenters who support an alternative approach should support their proposals with detailed cost benefit analyses.

31. *Use of Geographic Licensing.* Consistent with our approach in other bands used to provide fixed and mobile services, we propose to license the Upper C-band on an exclusive, geographic area basis.[86] Geographic area licensing provides flexibility to licensees, promotes efficient spectrum use, and helps facilitate rapid assignment of licenses, utilizing competitive bidding when necessary. We seek

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[81] The Commission designated the lower 280 megahertz of C-band spectrum in 100-megahertz increments as the A and B Blocks and in an 80-megahertz increment as C Block, reserving 20 megahertz as a guard band (at 3.98–4.0 GHz). *See 2020 C-band R&O*, 35 FCC Rcd at 2377, para. 72.

[82] *See 2020 C-band R&O*, 35 FCC Rcd at 2378, para 74.

[83] *See 2020 C-band R&O*, 35 FCC Rcd at 2378, para 74. Finding that 20 megahertz sub-blocks provide sufficient flexibility, the Commission concluded that it was unnecessary to divide the blocks even smaller into 10 megahertz sub-blocks. *Id.*

[84] *See Facilitating Shared Use in the 3100–3550 MHz Band*, WT Docket No. 19-348, Second Report and Order, Order on Reconsideration, and Order of Proposed Modification, 36 FCC Rcd. 5987, 6011–12, para. 59 (2021) (*3.45 GHz Band 2d R&O*).

[85] *See 2020 C-band R&O*, 35 FCC Rcd at 2378–79, para. 75.

[86] *See, e.g.*, *id.* § 27.6(h), (i) (AWS-1 and AWS-4, respectively).

comment on this approach, including the costs and benefits of adopting a geographic area licensing scheme. Parties who do not support the use of geographic licensing should explain their position, describe the type of licensing scheme they prefer, and identify the costs and benefits associated with an alternative licensing proposal.

32. *Geographic License Area.* For Lower C-band, the Commission decided to issue flexible-use licenses on a Partial Economic Area (PEA) basis for 20 megahertz sub-blocks in the contiguous United States and the District of Columbia because the PEA license-area size best optimizes and balances our statutory and regulatory objectives in licensing spectrum.[87] Consistent with that approach, we propose to license the Upper C-band on a PEA basis as well and invite commenters to indicate whether they support the continued use of PEA service areas to issue additional flexible use licenses in the Upper C-band. In line with our proposal to align both portions of the band by adopting a common part 27 flexible-use licensing approach and similar technical rules, we tentatively conclude that licensing on a PEA basis would further facilitate harmonization in the Upper and Lower C-band, increase the availability of spectrum aggregation opportunities for 5G services across the entire band, and encourage auction participation for large, regional, and small carriers for new Upper C-band licenses. Based on our experience with the Lower C-band, we also tentatively conclude that licensing on a PEA basis in the contiguous United States and the District of Columbia is likely to increase competition, spur investment, and make next generation technologies available sooner and on a larger scale than smaller or larger license areas would. Parties who oppose the use of PEAs should explain their position, describe the type of geographic licensing areas they prefer instead, and identify the costs and benefits associated with a different service area approach.

33. While the reconfiguration options discussed *supra* do not anticipate issuing licenses for areas outside the contiguous United States in the Upper C-band, we nonetheless seek comment on whether we should adopt a licensing approach for certain areas outside the contiguous United States. In AWS-1, AWS-3, AWS-4, and the H Block, the Commission issued separate licenses for the Gulf area.[88] In the Lower C-band, the Commission decided not to issue flexible-use licenses for PEAs including Honolulu, Anchorage, Kodiak, Fairbanks, Juneau, Puerto Rico, Guam-Northern Mariana Islands, U.S. Virgin Islands, American Samoa, and the Gulf.[89] Commenters who advocate for this approach should discuss what boundaries should be used, and whether special interference protection criteria or performance requirements may be necessary due to the unique radio propagation characteristics and antenna siting challenges that may exist in these areas, and address any unique impacts on these markets were we to reallocate them from FSS service to terrestrial wireless service.

b. Application Requirements and Eligibility

34. *Eligibility*. Consistent with established Commission practice in the Lower C-band and elsewhere, we propose to adopt an open eligibility standard for licenses in the Upper C-band.[90] We seek

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[87] *See 2020 C-band R&O*, 35 FCC Rcd at 2379–80, paras 77–80. In determining the appropriate geographic license size, the Commission must consider several factors, including: (1) facilitating access to spectrum by both small and large providers; (2) providing for the efficient use of spectrum; (3) encouraging deployment of wireless broadband services to consumers, especially those in rural areas and Tribal lands; and (4) promoting investment in and rapid deployment of new technologies and services. *See, e.g., Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, Report and Order*, 18 FCC Rcd 25162, 25174, para. 31 (2003) (AWS-1 Service Rules R&O); see also 47 U.S.C. § 309(j).

[88] *See Service Rules for the 746–764 and 776–794 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, First Report and Order, 15 FCC Rcd 476, 500, para. 56, n.137 (2000).

[89] *See 2020 C-band R&O*, 35 FCC Rcd at 2380, para. 80.

[90] The Commission has determined in a number of services that eligibility restrictions on licenses may be imposed only when open eligibility would pose a significant likelihood of substantial harm to competition in specific markets and when an eligibility restriction would be effective in eliminating that harm. This approach relies on market

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comment on this approach and whether it would encourage efforts to develop new technologies, products, and services, while helping to ensure efficient use of this spectrum.[91] We note that an open eligibility approach would not affect citizenship, character, or other generally applicable qualifications that may apply under our rules. Commenters should discuss the costs and benefits of the open eligibility proposal on competition, innovation, and investment. Finally, we note that a person who has been, for reasons of national security, barred by any agency of the federal government from bidding on a contract, participating in an auction, or receiving a grant is ineligible to hold a license that is required by 47 U.S.C. chapter 13 (the Spectrum Act) to be assigned by a system of competitive bidding under section 309(j) of the Communications Act.[92] In the event that we assign licenses through competitive bidding, we propose to apply this ineligibility provision to the Upper C-band.

c. Mobile Spectrum Holdings

35. Spectrum is an essential input for the provision of mobile wireless services, and to implement provisions of the Communications Act, the Commission has developed policies to ensure that spectrum is assigned in a manner that promotes competition, innovation, and efficient use.[93] We seek comment generally on whether and how to address any mobile spectrum holdings issues involving the Upper C-band spectrum to meet our statutory requirements and ensure competitive access to the band. Similar to the Commission's approach in the *2020 C-band R&O*, we propose not to adopt a pre-auction bright-line limit on the ability of any entity to acquire spectrum in the Upper C-band through competitive bidding at auction.[94] Since such pre-auction limits may unnecessarily restrict the ability of entities to participate in and acquire spectrum in an auction, we are not inclined to adopt such limits absent a clear indication that they are necessary to address a specific competitive concern, and we seek comment on any specific concerns of this type. Additionally, we propose to review holdings on a case-by-case basis when applications for initial licenses are filed post-auction to ensure that the public interest benefits of having a threshold on spectrum applicable to secondary market transactions are not rendered ineffective.[95] Finally, we propose to include the Upper C-band spectrum in the Commission's spectrum screen, which helps to

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forces absent a compelling showing that regulatory intervention to exclude potential participants is necessary. *See, e.g., Service Rules for Advanced Wireless Services in the 2000–2020 MHz and 2180–2200 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102, 16193, paras. 241–42 (2012) (*AWS-4 Service Rules R&O*); *700 MHz Second Report and Order*, 22 FCC Rcd at 15381, 15383–84 paras. 253, 256; *Allocations and Service Rules for the 71–76 GHz, 81–86 GHz and 92–95 GHz Bands*, Report and Order, 18 FCC Rcd 23318, 23346–47, para. 70 (2003).

[91] *See* 47 U.S.C. § 309(j)(3).

[92] *See* 47 CFR § 27.12(b) (citing 47 U.S.C. § 1404(c)).

[93] Section 309(j)(3) of the Communications Act provides that, in designing systems of competitive bidding, the Commission must "include safeguards to protect the public interest in the use of the spectrum," and must seek to promote various objectives, including "promoting economic opportunity and competition and ensuring that new and innovative technologies are readily accessible to the American people by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants," and promoting the "efficient and intensive use" of spectrum. 47 U.S.C. § 309(j)(3). *Policies Regarding Mobile Spectrum Holdings Expanding the Economic Innovation Opportunities of Spectrum Through Incentive Auctions*, WT Docket No. 12-269, Report and Order, 29 FCC Rcd 6133, 6137, para. 8 (2014) (*Mobile Spectrum Holdings Report and Order*).

[94] *2020 C-band R&O*, 35 FCC Rcd at 2381–83, paras. 83–86; *see also Expanding Flexible Use of the 3.7 to 4.2 GHz Band,* Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, 33 FCC Rcd 6915, 6963–64, para. 147 (2018) (*2018 C-band Order and NPRM*); *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, Second Report and Order, Second Further Notice of Proposed Rulemaking*, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988, 11009–11, paras. 70–74 (2017) (*2017 Spectrum Frontiers Order and FNPRM*).

[95] *See, e.g.*, *2020 C-band R&O*, 35 FCC Rcd at 2383–84, paras. 86, 89.

identify markets that may warrant further competitive analysis, for evaluating proposed secondary market transactions.[96]

d. License Term

36. We propose a 15-year term for licenses in the Upper C-band.[97] In the *2020 C-band R&O*, the Commission found that a 15-year license term was warranted as it would afford licensees sufficient time to achieve significant build-out obligations post-transition and also encourage investment in the Lower C-band given the clearing, relocation, and repacking that had to occur prior to the introduction of mobile operations.[98] We seek comment on the costs and benefits of using the same term in the instant context. In addition, we invite commenters to submit alternate proposals for the appropriate license term, which should include a discussion on the costs and benefits. Commenters seeking to make adjustments to our proposal should explain how their proposals reflect the process for any incumbent transition work that has to occur before mobile operations can be deployed in the Upper C-band.

e. Performance Requirements; Renewal

37. Performance requirements play a critical role in ensuring that licensed spectrum does not lie fallow, and are required for licenses issued through competitive bidding.[99] To that end, the Commission has imposed different performance and construction requirements in various spectrum bands based on the specific characteristics of each band in order to ensure that spectrum is intensely and efficiently utilized in the public interest. In the instant context, we propose to use the performance requirements previously adopted for the Lower C-band, although we seek comment below on possible alternative approaches.

38. *Mobile or Point-to-Multipoint Performance Requirements.* In the *2020 C-band R&O*, the Commission required Lower C-band licensees offering mobile or point-to-multipoint services to provide reliable signal coverage and offer service to at least 45% of the population in each of their license areas within eight years of the license issue date (first performance benchmark), and to at least 80% of the population in each of their license areas within 12 years from the license issue date (second performance benchmark).[100] These performance milestones were designed to provide sufficient time for incumbent operations to transition out of the Lower C-band given that new flexible-use licensees could not commence operations until the necessary band clearing had been completed.[101] Faced with a similar but potentially more complex transition in the current context, we propose to apply same benchmarks for new

[96] *See, e.g.*, *2020 C-band R&O*, 35 FCC Rcd at 2383, para. 87. The Commission examines the suitability and availability of spectrum to determine whether particular bands should be included within the total spectrum screen. *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6169–70, paras. 71–75. Suitability is determined by whether the spectrum is capable of supporting mobile service given its physical properties and the state of equipment technology, whether the spectrum is licensed with a mobile allocation and corresponding service rules, and whether the spectrum is committed to another use that effectively precludes its use for mobile services. *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6169, para. 71. Spectrum is considered "available" if it is "fairly certain that it will meet the criteria for suitable spectrum in the near term, an assessment that can be made at the time the spectrum is licensed or at later times after changes in technology or regulation that affect the consideration." *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6169, para. 71 (internal quotation marks omitted).

[97] The Communications Act does not specify a term limit for wireless radio services licenses. The only statutory limit on license terms is eight years for licenses in the broadcast services. *See* 47 U.S.C. § 307(c)(1); *see also* 47 CFR § 73.1020(a).

[98] *See 2020 C-band R&O*, 35 FCC Rcd at 2384–85, para. 90.

[99] 47 U.S.C. § 309(j)(4)(B).

[100] *See 2020 C-band R&O*, 35 FCC Rcd at 2385, para. 93; 47 CFR § 27.14(v)(1).

[101] *See 2020 C-band R&O*, 35 FCC Rcd at 2386, para. 95.

terrestrial mobile licensees in the Upper C-band as we did in the Lower C-band. We believe that our proposal will provide sufficient time for incumbents to transition their operations and for new Upper C-band flexible-use licensees to deploy and meet the requisite coverage requirements once the license area has been cleared. We also believe that providing clear benchmarks will provide greater certainty for licensees, ensure investment, and encourage robust deployment of valuable mid-band spectrum in the public interest. We seek comment on this proposal, and whether it strikes the appropriate balance between license-term length and a significant final build-out requirement.

39. We also seek comment on any potential alternatives. We invite commenters to indicate whether we should consider adjustments to the proposed performance benchmarks for the Upper C-band and explain their rationale for proposing such adjustments. We also seek comment on whether small entities face any special or unique issues with respect to build-out requirements such that they require certain accommodations or additional time to comply. Commenters should discuss and quantify how any build-out requirements they support will affect investment and innovation, as well as discuss and quantify other associated costs and benefits.

40. *Alternate Internet-of-Things (IoT) Performance Requirements.* We note that licensees providing IoT-type fixed and mobile services may benefit from an alternative performance benchmark metric in contrast with those we may impose on fixed and mobile services. In the *2020 C-band R&O*, the Commission found that the use of geographic coverage levels would maintain reasonable parity between performance requirements for IoT providers and performance requirements for mobile providers relying on population-based coverage metrics.[102] As a result, the Commission provided Lower C-band licensees the flexibility to demonstrate that they offer geographic area coverage of 35% of the license area at the first (eight-year) performance benchmark, and geographic area coverage of 65% of the license area at the second (12-year) performance benchmark.[103] The Commission adopted this framework to provide enough certainty to licensees to encourage investment and deployment as soon as possible, while retaining enough flexibility to accommodate both traditional services and innovative services or deployment patterns.[104] In addition, the Commission asserted that a performance metric based on geographic area coverage (or presence) allows for networks that provide meaningful service but deploy along lines other than residential population.[105] Although the Commission adopted an additional performance metric to facilitate the deployment of IoT and other innovative services, it also emphasized that there is no requirement that a licensee build a particular type of network or provide a particular type of service in order to use whatever metric it selects to meet its performance requirement.[106]

41. We propose to adopt the geographic area coverage levels applied in the Lower C-band as alternative IoT performance benchmarks for the Upper C-band and invite commenters to provide input on our proposal, which we believe will provide sufficient time for FSS incumbent operators to transition their operations and for new Upper C-band flexible-use licensees to deploy and meet the requisite

[102] The Commission found that in most license areas, the residential population is unevenly distributed. In those areas, building a network covering 65% of the geographic area would require more intensive deployment than one covering 65% of the population, suggesting that a lower percent coverage requirement for geographic area could be appropriate. *See 2020 C-band R&O*, 35 FCC Rcd at 2387, para. 97, n.297.

[103] *See 2020 C-band R&O*, 35 FCC Rcd at 2387, para. 97; 47 CFR § 27.14(v)(2).

[104] *See 2020 C-band R&O*, 35 FCC Rcd at 2387, para. 97 (citing *2018 Spectrum Frontiers Order and FNPRM*, 33 FCC Rcd at 5580, paras. 8–9).

[105] This definition separates "traditional" point-to-point links from the sensor and device connections that likely will be part of new IoT networks and applies to a network of fixed sensors or smart devices operating at low power over short distances. *See 2020 C-band R&O*, 35 FCC Rcd at 2387, para. 98; *see generally* 47 CFR § 101.143(a) (traditional point-to-point links between 1850–7125 MHz must meet minimum path length of 17 km or the EIRP must be reduced).

[106] *See 2020 C-band R&O*, 35 FCC Rcd at 2387, para. 98.

coverage requirements. We also believe that our proposed benchmarks will provide enough certainty to licensees to encourage investment and deployment as soon as possible, while affording them enough flexibility to accommodate both traditional services and innovative services or deployment patterns. We invite commenters to submit alternate proposals or to indicate whether we should consider adjustments to the proposed performance benchmarks and explain their rationale for proposing such adjustments.

42. *Fixed Point-to-Point under Flexible Use*. For licensees providing fixed, point-to-point links, the Commission generally has evaluated build-out by comparing the number of links in operation to the population of the license area. In the *2020 C-band R&O*, the Commission adopted a requirement that part 27 geographic area licensees providing Fixed Service in the Lower C-band must demonstrate within eight years of the license issue date (first performance benchmark) that they have four links operating and providing service, either to customers or for internal use, if the population within the license area is equal to or less than 268,000.[107] If the population within the license area is greater than 268,000, the Commission required licensees providing point-to-point service to demonstrate they have at least one link in operation and providing service, either to customers or for internal use, per every 67,000 persons within a license area.[108] Licensees relying on point-to-point service were required to demonstrate within 12 years of the license issue date (final performance benchmark) that they have eight links operating and providing service, either to customers or for internal use, if the population within the license area is equal to or less than 268,000.[109] If the population within the license area is greater than 268,000, the Commission required a demonstration that the licensee is providing service and has at least two links in operation per every 67,000 persons within a license area.[110]

43. We propose adopting performance standards that are consistent with the benchmarks for Lower C-band for Upper C-band licensees relying on point-to-point service. For the same reasons as stated above, we believe that extending the Lower C-band framework will afford sufficient time for FSS incumbent operators to transition their operations and for new Upper C-band flexible-use licensees to deploy and meet the requisite coverage requirements once the license area has been cleared of FSS operations. We invite the public to comment on this proposal and on any adjustments or alternative proposals, as well as their basis for proposing such adjustments or alternatives. Commenters should also discuss and quantify how any proposed performance requirements will impact investment and innovation, as well as discuss and quantify other costs and benefits associated with the proposal in question.

44. *Penalty for Failure to Meet Performance Requirements*. To encourage compliance with our performance benchmarks, we propose imposing meaningful and enforceable penalties on Upper C-band licensees that fail to timely build-out. Consistent with our decision in the *2020 C-band R&O*,[111] we propose to adopt a rule requiring that, in the event a licensee fails to meet the first performance benchmark, the licensee's second benchmark and license term would be reduced by two years, thereby requiring it to meet the second performance benchmark two years sooner (at 10 years into the license term) and correspondingly reducing its license term to 13 years. As with the approach the Commission took in the Lower C-band,[112] we further propose that, in the event a licensee fails to meet the second performance benchmark for a particular license area, its authorization for each license area in which it fails to meet the performance requirement shall terminate automatically without Commission action.

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[107] *See 2020 C-band R&O*, 35 FCC Rcd at 2388, para. 100; 47 CFR § 27.14(v)(1).

[108] *See 2020 C-band R&O*, 35 FCC Rcd at 2388, para. 100; 47 CFR § 27.14(v)(1).

[109] *See 2020 C-band R&O*, 35 FCC Rcd at 2388, para. 100; 47 CFR § 27.14(v)(1).

[110] *See 2020 C-band R&O*, 35 FCC Rcd at 2388, para. 100; 47 CFR § 27.14(v)(1).

[111] *See 2020 C-band R&O*, 35 FCC Rcd at 2389, paras. 102–03.

[112] *See 2020 C-band R&O*, 35 FCC Rcd at 2389, para. 102.

45. In the event a licensee's authority to operate terminates automatically, we propose that the licensee's spectrum rights would become available for reassignment pursuant to the competitive bidding provisions of section 309(j) of the Communications Act.[113] Consistent with the Commission's rules applicable to Lower C-band and in other bands,[114] we propose that any Upper C-band licensee that forfeits its license for failing to meet its performance requirements would be precluded from regaining the spectrum rights covered by the license.[115] We invite comments on these proposals. Is the approach that the Commission adopted for the Lower C-band transition appropriate for the Upper C-band? Commenters should address the costs and benefits of our proposals, and of any suggested alternatives.

46. *Compliance Procedures*. In addition to the compliance procedures applicable to all part 27 licensees, including the filing of electronic coverage maps and supporting documentation,[116] we propose that such electronic coverage maps must accurately depict both the boundaries of each licensed area and the coverage boundaries of the actual areas to which the licensee provides service.[117] If a licensee does not provide reliable signal coverage to its entire license area, we propose that its map must accurately depict the boundaries of the area or areas within each license area not being served. Further, we propose that each licensee also must file supporting documentation certifying the type of service it is providing for each licensed area within its service territory and the type of technology used to provide such service. Supporting documentation must include the assumptions used to create the coverage maps, including the propagation model and the signal strength necessary to provide reliable service with the licensee's technology. We seek comment on our proposal. We also seek comment on whether small entities face any special or unique issues with respect to the transition such that they would require additional time to comply.

47. *License Renewal*. We propose applying the general renewal requirements applicable to all Wireless Radio Services (WRS) licensees to licensees in the Upper C-band.[118] As explained in further detail below, we believe that this approach will promote consistency across the Upper and Lower C-band.

48. *Renewal Term Construction Obligation.* We propose to apply our general part 27 renewal requirements for wireless licenses to the Upper C-band, as the Commission has for the Lower C-band, 3.45 GHz band, and the 3.55–3.7 GHz band.[119] Correspondingly, we propose to include the Upper C-band in the unified renewal framework for Wireless Radio Services. This means that Upper C-band licensees will be required to comply with section 1.949 of our rules by demonstrating that, over the course of their license term, they either: (1) provided and continue to provide service to the public, or (2) operated and continue to operate the license to meet the licensee's private, internal communications needs.[120] Licensees can demonstrate compliance with this requirement either through the renewal showing in section (f) of that rule, or the relevant safe harbor found in section (e).[121] Consistent with other licensing rules we are proposing to adopt in this item, we believe that our proposal to apply this

[113] 47 U.S.C. § 309(j).

[114] *See, e.g.*, 47 CFR § 27.14(a), (q)(6), (r)(4); *see also 2020 C-band R&O,* 35 FCC Rcd at 2389, para. 102–3; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6033 paras. 129–31.

[115] *See 2020 C-band R&O,* 35 FCC Rcd at 2389, para. 103.

[116] *See* 47 CFR §§ 1.946(d), 27.14(k).

[117] *See 2020 C-band R&O,* 35 FCC Rcd at 2389, para. 104.

[118] *See* 47 CFR § 1.949 (Application for renewal of authorization).

[119] *See 2020 C-band R&O*, 35 FCC Rcd at 2390, paras. 107–09; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6029–30 paras. 118–19; *Promoting Investment in the 3500–3700 MHz band*, GN Docket No. 17-258, Report and Order, 33 FCC Rcd 10598, 10628–29, para. 55 (2018) (*2018 3.5 GHz Report and Order*).

[120] 47 CFR § 1.949.

[121] 47 CFR § 1.949(e)–(f).

renewal standard to the Upper C-band will help create uniform flexible-use licensing rules across the Upper and Lower C-band and facilitate the deployment of next-generation wireless technologies.

49. In addition to, and independent of, the general renewal provisions set forth in our rules, we seek comment on applying specific renewal term construction obligations to Upper C-band licensees. In particular, we invite comment on whether there are unique characteristics of the Upper C-band that might warrant a different approach than the general renewal requirements applicable to all Wireless Radio Services. Do any of our proposals for the Upper C-band, such as longer license terms,[122] necessitate a more tailored approach than our general part 27 renewal requirements? Commenters advocating rules specific to the Upper C-band should address the costs and benefits of their proposed rules and discuss how a given proposal will encourage investment and deployment in areas that might not otherwise benefit from significant wireless coverage.

3. Technical Rules

50. In addition to the proposed licensing and operating rules discussed *supra*, we seek comment on adopting technical rules that will maximize potential uses of the Upper C-band for next generation wireless technologies, encourage efficient use of spectrum resources, and promote investment in the Upper C-band. As a general matter, we propose to align the technical rules for this band segment with those previously adopted for the adjacent Lower C-band (3.7–3.98 GHz) to promote harmony and standardization across the Upper and Lower C-band, produce significant economies of scale resulting in more affordable products and services, rapid operational expansion, and deployment of high-powered terrestrial 5G, and align with global efforts.[123] We seek comment on this overarching proposal and its potential impact on operations in adjacent bands, as well as on alternative approaches. Specifically, we seek comment on appropriate power limits, out-of-band emissions limits, antenna height limits, service area boundary limits, international coordination requirements, and any other technical rules that would provide the flexibility necessary to maximize use of the band. We also ask that commenters provide detailed technical data in support of their positions and any alternative approaches they may advance in each of these areas.

a. Power Levels

51. *Power Limits for Fixed and Base Stations*. We propose to permit base stations in non-rural areas to operate at power levels up to 1640 watts per megahertz EIRP and base stations in rural areas to operate with double the non-rural power limits (3280 watts per megahertz EIRP). Our proposal mirrors the Commission's decision to adopt power limits under the part 27 flexible use rules for the Lower C-band and the 3.45 GHz band that are consistent with other broadband mobile services in nearby bands (AWS-1, AWS-3, AWS-4, and PCS).[124] Consistent with our decisions in those bands, we believe that setting a higher power limit for rural areas will further the Commission's objective of fostering rural

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[122] While the majority of existing wireless radio services have 10-year license terms, we are seeking comment on adopting a 15-year license term consistent with the term adopted for the Lower C-band licenses in the *2020 C-band R&O*. *See 2020 C-band R&O*, 35 FCC Rcd at 2384–85, para. 90; *see, e.g.*, 47 CFR §§ 24.15 (PCS), 27.13(a), (c), (d), (e), (g), (h), (i) (WCS).

[123] The 3.7–4.2 GHz band is internationally harmonized for mobile, except aeronautical, use, and Upper C-band is part of a 3GPP-standardized band, known as n77, that spans from 3.3 to 4.2 GHz and is considered the most widely deployed spectrum range for 5G networks globally. *See, e.g.,* AT&T Comments at 7, CTIA Comments at 9, Qualcomm Comments at 4, Ericsson Comments at 5, Nokia Comments at 3–4, WIA Reply at 4–5, Digital Progress Institute Reply at 1–2.

[124] *See 2020 C-band R&O*, 35 FCC Rcd at 2468, para. 335; 47 CFR §§ 27.50(d)(1)–(2), 27.50(j)(1)–(2) (power limits for AWS and PCS, and Lower C-band, respectively). The Commission applied the same rationale in adopting rural and non-rural power limits for base station operations in the 3.45 GHz band that are consistent with limits adopted for the Lower C-band, AWS, and PCS bands. *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6014, para. 70; *see also* 47 CFR §27.50(k)(1)–(2).

deployment of broadband services.[125] Further, consistent with our approach in the Lower C-band, we propose to adopt for the Upper C-band the part 27 requirement that, in measuring transmissions using an average power technique, the peak-to-average ratio (PAR) may not exceed 13 dB.[126]

52. In the *2020 C-band R&O*, the Commission provided 3.7 GHz Service licensees with the flexibility to optimize their system designs to offer wide area coverage without sacrificing the flexibility needed to address coexistence issues with incumbent FSS operations.[127] Specifically, we applied the same power density limit to all channel bandwidths to facilitate uniform power distribution across a licensee's authorized band, regardless of whether wideband or narrowband technologies are being deployed.[128] This approach aligns with that also adopted in the 3.45 GHz band, where such limit applies to emissions of all bandwidths, including those of less than one megahertz, to facilitate uniform power distribution across a licensee's authorized band regardless of whether it deploys wideband or narrowband technologies.[129]

53. Because advanced antenna systems often have multiple radiating elements in the same sector, the Commission adopted power limits in the 3.45 GHz and Lower C-bands that apply to the aggregate power of all antenna elements in any given sector of a base station.[130] The Commission found that adopting power levels consistent with other bands used for wide area wireless operations (e.g., AWS) would permit the Lower C-band to reach its full potential and licensees to achieve similar coverage, creating network efficiencies between network deployments in different spectrum bands.[131] By adopting base station power limits that have spurred development in other bands, the Commission sought in the Lower C-band to promote investment and facilitate the rapid and robust deployment of next-generation mobile broadband services, including 5G.[132] On this basis, we similarly propose to apply sections 27.50(j)(1)–(2) and (4)–(5) of the Commission's rules to both fixed and base stations operating in the Upper C-band.[133] We invite comment on this proposal.

54. We also seek comment on alternative base station power limits. We invite commenters who propose alternative solutions to provide specific technical details and thorough analyses to support their proposals, including the effect on receiver blocking or other aggregate interference issues impacting receivers operating above and below the band. In addition to providing this technical support, proponents should outline the corresponding costs and benefits underlying their proposals. Should power be

[125] *See 2020 C-band R&O*, 35 FCC Rcd at 2468, para. 335.

[126] *See* 47 CFR § 27.50(j)(4)–(5).

[127] *See 2020 C-band R&O*, 35 FCC Rcd at 2468, para. 335; *see also Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915, 6970, para. 164 (2018) (*2018 C-band NPRM*).

[128] The Commission set a uniform power density distribution across the full 3.7–3.98 GHz band regardless of channel bandwidth. Rather than impose an absolute power limit for narrow emissions (or emissions less than one megahertz wide), the Commission adopted the same power density limits for all emissions in the band. *See 2020 C-band R&O*, 35 FCC Rcd at 2469, para. 338; *see also 2018 C-band NPRM*, 33 FCC Rcd at 6970, para. 164. The Commission did not believe a separate power per emission distinction was necessary to accommodate narrowband emissions because they are often integrated with wideband emissions as additional resource blocks as opposed to being deployed as separate systems. Nor did it find it necessary to adopt a minimum emission bandwidth for the band to allow licensees to choose the best technology or a mix of technologies to meet market demands. *Id.*

[129] *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6014, para. 70.

[130] *See 2020 C-band R&O*, 35 FCC Rcd at 2468, para. 335; *see also 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6014, para. 70.

[131] *See 2020 C-band R&O*, 35 FCC Rcd at 2468, para. 336.

[132] *See 2020 C-band R&O*, 35 FCC Rcd at 2468, para. 336.

[133] 47 CFR § 27.50(j)(1)–(2), (4)–(5) (Lower C-band power limits).

composed of transmit conducted power and antenna gain with some flexibility to "mix and match" both, or should the rule only define the final power in EIRP? Although higher power limits can facilitate deployment, what impact might this approach have on adjacent bands? Are there particular circumstances or locations where a different approach may be merited in consideration of adjacent band operations?

55. *Power Limits for Mobiles and Portables*. We propose to adopt a 1 Watt (30 dBm) EIRP power limit for mobile devices, matching the standards adopted for the Lower C-band[134] and the 3.45 GHz band.[135] In the *2020 C-band R&O*, the Commission found that a 1 Watt limit provides adequate power for robust mobile service deployment and also permits operation of mobile device power classes as outlined in the 5G standards given that mobile devices typically operate at levels below 1 Watt to preserve battery life and meet both human exposure limits and power control requirements.[136] In recognition that 3.7 GHz Service licensees are expected to deploy much wider channel bandwidths and will operate in exclusively licensed spectrum, the Commission indicated that it was adopting a mobile device power limit intended to provide consistency between mobile 5G deployments in the Lower C-band and comparable macro cell deployment in the PCS, AWS, and similar bands.[137]

56. Similarly, in the *3.45 GHz Band 2d R&O*, the Commission found that providing consistency between mobile 5G deployments in various bands is crucial for the entire 3 GHz band to reach its full potential and therefore aligned the mobile power limit for the 3.45 GHz band with that adopted for the Lower C-band.[138] The Commission concluded that this mobile power limit will provide an adequate range for operation of different mobile and fixed broadband deployments across a wide variety of use cases and permit operation of mobile power classes as outlined in the 3GPP standards.[139] In light of this precedent, we invite comment on our proposed power limit for mobiles and portables operating in the Upper C-band. We also seek comment on whether alternative mobile station power limits should be considered based on expected use cases. Commenters supporting alternative mobile power limits should include a technical justification for such power limits and a detailed evaluation of any coexistence issues. Commenters should also provide an analysis of the costs and benefits of their proposals.

b. Out-of-Band Emissions

57. *Base Station Out-of-Band Emissions.* As a baseline matter, we propose here to adopt base station out-of-band emission (OOBE) requirements consistent with the limits adopted for the Lower C-band.[140] For the Lower C-band, base stations were required to suppress their emissions beyond the edge of their authorization to a conducted power level of -13 dBm/MHz.[141] The Commission adopted this limit because it is consistent with emission limits established for many other mobile broadband services as well as those established for 5G technologies by standards bodies, and has been widely accepted as

[134] *See 2020 C-band R&O*, 35 FCC Rcd at 2470, paras. 340–42; 47 CFR § 27.50(j)(3).

[135] *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6014, para. 70.

[136] *See 2020 C-band R&O*, 35 FCC Rcd at 2470, para. 341.

[137] *See 2020 C-band R&O*, 35 FCC Rcd at 2470, para. 341.

[138] *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6016, paras. 76–77.

[139] *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6016, paras. 76–77.

[140] *See 2020 C-band R&O*, 35 FCC Rcd at 2470, para. 343; 47 CFR § 27.53(l)(1). The Commission modeled the base station OOBE limits for Lower C-band after the OOBE limits used for AWS services. *See 2020 C-band R&O*, 35 FCC Rcd at 2470, para. 343 (citing 47 CFR § 27.53(h) (AWS emission limits)).

[141] *See 2020 C-band R&O*, 35 FCC Rcd at 2470, para. 343.

being adequate for reducing unwanted emissions into adjacent bands.[142] We seek comment on whether to harmonize the limits applied to the Lower and Upper C-bands, generally on what the appropriate limits should be, and whether they should diverge from the baseline cited *supra*. We also seek comment on whether the same or different OOBE limits should be applied to emissions within the band as compared to those at either edge of the band. Should we consider additional requirements beyond the upper and lower band edges similar to the two-step limits adopted in the 3.45 GHz and CBRS bands to facilitate widespread deployment of next-generation wireless services while ensuring effective coexistence with incumbent federal and non-federal services operating in adjacent bands?[143]

58. For base station OOBE, we also propose to adopt the same part 27 measurement procedures and resolution bandwidth that are currently used for the Lower C-band.[144] Specifically, the resolution bandwidth used to determine compliance with the base station limit is 1 megahertz or greater, except that within the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block where a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed.[145] We seek comment on our proposal to apply the part 27 measurement procedures and resolution bandwidth and invite input on alternative approaches to defining resolution bandwidth.

59. *Mobile Out-of-Band Emissions*. We propose to adopt a mobile OOBE limit that is consistent with the service rules adopted for the Lower C-band.[146] Specifically, we propose to require mobile units to suppress their conducted emissions to no more than -13 dBm/MHz outside their authorized frequency band, i.e., at the authorized channel edge as measured at the antenna terminals.[147] We also propose to adopt the same measurement procedure as we adopted for the Lower C-band where a narrower resolution bandwidth can be used to measure the OOBE limits in the spectrum immediately

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[142] *See 2020 C-band R&O*, 35 FCC Rcd at 2471, para. 344. The Commission stated that it was establishing a fixed emission mask that fits within the 3GPP specifications and is less complicated and that it believes manufacturers and licensees are familiar with our standard -13 dBm/MHz limit and have tools to ensure they meet this limit. *Id.* The -13 dBm/MHz base station OOBE limit has been used successfully to protect adjacent operations from harmful interference in several AWS bands as well as in the Lower C-band and the 3.45 GHz band. *See 2020 C-band R&O*, 35 FCC Rcd at 2470, para. 343; *2018 C-band NPRM*, 33 FCC Rcd at 6971, para. 168; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6016, para. 79; *see also* 47 CFR § 27.53(h) (AWS emission limits); *id.* § 27.53(l)(1) (Lower C-band emission limits); *id.* § 27.53(n)(1) (3.45 GHz emission limits).

[143] This approach might, for instance, promote the successful coexistence between new Upper C-band operations and upgraded radio altimeters in the 4.2–4.4 GHz band. *See infra* Part III.D. Coexistence with Adjacent Band Radio Altimeters. In addition to requiring 3.45 GHz Service base stations to suppress their emissions beyond the edge of their authorization to a conducted power level of -13 dBm/MHz, the Commission also required them to meet an additional two-step limit of -25dBm/MHz and -40dBm/MHz at the upper and lower band edges to ensure effective coexistence with mission-critical federal and other non-federal services operating in the adjacent bands. *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6016–17, para. 80.

[144] *See* 47 CFR § 27.53(l)(1). In the *2020 C-band R&O*, the Commission decided to apply the part 27 measurement procedures and resolution bandwidth that are used for AWS devices, outlined in section 27.53(h), to Lower C-band. *See 2020 C-band R&O*, 35 FCC Rcd at 2471, para. 346 (citing 47 CFR § 27.53(h)(3), (4) (AWS emission limits)).

[145] *See 2020 C-band R&O*, 35 FCC Rcd at 2471, para. 346; 47 CFR § 27.53(l)(1). The Commission adopted the same part 27 measurement procedures and resolution bandwidth for the base station OOBE limit in the 3.45 GHz band, with a slight refinement. *See* 47 CFR § 27.53(n)(1).

[146] *See 2020 C-band R&O*, 35 FCC Rcd at 2472, para. 347; 47 CFR § 27.53(l)(2).

[147] *See 2020 C-band R&O*, 35 FCC Rcd at 2472, para. 347; *see also 2018 C-band NPRM*, 33 FCC Rcd at 6971, para. 168. The Commission adopted the same mobile OOBE limit for the 3.45 GHz band as well but applied the part 27 measurement procedures and resolution bandwidth that are used for AWS devices outlined in section 27.53(h), with a slight refinement. *See 3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6018–19, paras. 86–87; 47 CFR § 27.53(n)(2).

adjacent to the channel edge.[148] For emissions within 1 megahertz from the channel edge, the minimum resolution bandwidth would be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kilohertz.[149] In the bands between one and five megahertz removed from the licensee's authorized frequency block, the minimum resolution bandwidth would be 500 kilohertz.[150] We believe that this proposal will promote consistency between mobile 5G deployments in various bands and does not increase the potential for OOBE to cause harmful interference and seek comment on that belief. We seek comment generally on whether to harmonize the mobile OOBE limits applied to the Lower and Upper C-bands, generally on what the appropriate limits should be, and whether they should diverge from the baseline cited *supra*.

60. *Other OOBE Limit Issues*. As noted in the *2020 C-band R&O*, the Commission adopted provisions that permit licensees in the Lower C-band to implement private agreements with adjacent block licensees to exceed the adopted OOBE limits.[151] In addition, like other part 27 services, the *2020 C-band R&O* applied section 27.53(i) to the Lower C-band, providing that the Commission may, in its discretion, require greater attenuation than specified in the rules if an emission outside of the authorized bandwidth causes harmful interference.[152] Consistent with this approach, we propose to apply sections 27.53(h)(4) and 27.53(i) to the Upper C-band as well. We seek comment on our proposal and invite commenters to indicate whether harmonizing the OOBE limit for Upper and Lower C-band segments will help facilitate broader deployment of multi-band 5G radio equipment that can operate across the 3 GHz bands. What would be the impact of implementing a consistent OOBE limit across Upper and Lower C-band segments relative to immediately adjacent FSS operations or operations in nearby channels in the 3.5 GHz band? How might any such impacts be addressed? Finally, we also seek comment on whether base station power levels or OOBE limits should be adjusted to promote coexistence with radio altimeters operating in the adjacent 4.2–4.4 GHz band.[153]

c. Antenna Height Limits

61. Consistent with the existing part 27 AWS rules and Lower C-band and 3.45 GHz band requirements, none of which impose antenna height limits on antenna structures, we propose to not restrict antenna heights for Upper C-band operations beyond any requirements necessary to ensure air navigation safety.[154] In both the Lower C-band and 3.45 GHz proceedings, the Commission noted that rather than using antenna height limits to reduce interference between mobile service licensees, as had been done in the past, it has more recently used field strength limits at service boundaries to provide licensees more flexibility to design their systems while still ensuring harmful interference protection between systems.[155] Furthermore, the limitations of field strength at the geographical boundary of the

[148] *See 2020 C-band R&O*, 35 FCC Rcd at 2472, para. 348; 47 CFR § 27.53(l)(2); *see also,* 47 CFR § 27.53(l)(1)–(2).

[149] *See 2020 C-band R&O*, 35 FCC Rcd at 2472, para. 348; 47 CFR § 27.53(l)(2).

[150] *See 2020 C-band R&O*, 35 FCC Rcd at 2472, para. 348; 47 CFR § 27.53(l)(2).

[151] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, para. 350 (citing 47 CFR § 27.53(h)(4)).

[152] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, para. 350 (citing 47 CFR § 27.53(h)(4)).

[153] *See infra* discussion at Section III.D Coexistence with Adjacent Band Radio Altimeters.

[154] While part 27 of the Commission's rules do not specify antenna height restrictions for AWS-1 and AWS-3 base stations, all such services are subject to section 27.56 of our rules which bans antenna heights that would be a hazard to air navigation. *See* 47 CFR § 27.56. Consistent with the part 27 rules, the Commission has declined to impose antenna height limits in the Lower C-band and 3.45 GHz band beyond any requirements necessary to ensure physical obstructions do not impact air navigation safety. *See 2020 C-band R&O*, 35 FCC Rcd at 2473, paras. 351–53; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6020, paras. 94–95.

[155] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, para. 353; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6020, para. 95.

license also effectively limit antenna heights.[156] Given its success in other services, the Commission adopted the same approach in the Lower C-band as well as the 3.45 GHz band.[157] We propose to take the same approach here as well and seek comment on this proposal, including its costs and benefits along with those associated with any alternative approaches that may be advanced.

d. Service Area Boundary Limit

62. In the *2020 C-band R&O*, the Commission adopted a -76 dBm/m^2/MHz power flux density (PFD) limit at a height of 1.5 meters above ground at the geographical border of 3.7 GHz Service licensees' service areas.[158] We propose to apply the same service area boundary limit for any new terrestrial wireless licensees in the upper portion of the band. As the Commission previously observed, the -76 dBm/m^2/MHz PFD limit is the same as what we established for the Upper Microwave Flexible Use Service (UMFUS), and it is both easy to measure and scales with channel bandwidth to offer licensees flexibility for demonstrating compliance.[159] We seek comment on this proposal. Is this an appropriate limit in the Upper C-band, or should we impose a different service area boundary power limit than that which applies to the 3.7 GHz Service in the lower portion of the band? Would some other limit better protect geographically adjacent licensees from co-channel interference?

e. International Boundary Requirements

63. We propose to apply section 27.57(c) of the Commission's rules to terrestrial licensees in the Upper C-band, consistent with the approach that was adopted for the Lower C-band.[160] Section 27.57(c) requires all part 27 operations to comply with international agreements for operations near the Mexican and Canadian borders.[161] Under this provision, licensee operations must not cause harmful co-interference across the border, consistent with the terms of agreements currently in force. We note that modification of the existing rules might be necessary in order to comply with any future agreements with Canada and Mexico regarding the use of these bands. We seek comment on this proposal, including the costs and benefits of any alternative approaches.

f. Other Part 27 Rules

64. Consistent with the approach taken in the Lower C-band, we propose to once again adopt several additional technical rules that are applicable to all part 27 services, including sections 27.51 (Equipment authorization), 27.52 (RF safety), 27.54 (Frequency stability), and part 1, subpart BB of the Commission's rules (Disturbance of AM Broadcast Station Antenna Patterns) for new terrestrial commercial wireless operations in the Upper C-band.[162] As observed in the *2020 C-band R&O*, because the Upper C-band will be a part 27 service, we believe that these rules implement important safeguards for all wireless services to ensure that devices meet RF safety limits and that the potential for harmful interference to other operations is minimized.[163] We seek comment on this proposal. Should we consider a different approach with respect to the adoption of these generally applicable part 27 technical rules to govern new terrestrial wireless licenses in the Upper C-band? Are there other generally applicable rules, not listed above, that we should apply to these new Upper C-band operations?

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[156] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, para. 353; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6020, para. 95.

[157] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, para. 353; *3.45 GHz Band 2d R&O*, 36 FCC Rcd. at 6020, para. 95.

[158] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, paras. 354–55; 47 CFR § 27.55(d).

[159] *See 2020 C-band R&O*, 35 FCC Rcd at 2473, para. 355; *see also 2018 C-band NPRM*, 33 FCC Rcd at 6975, para. 184.

[160] *See 2020 C-band R&O*, 35 FCC Rcd at 2474, para. 356; 47 CFR § 27.57(c).

[161] 47 CFR § 27.57(c).

[162] *2020 C-band R&O*, 35 FCC Rcd at 2474, para. 357.

[163] *See 2020 C-band R&O*, 35 FCC Rcd at 2474, para. 357.

65. We also propose to require client devices to be capable of operating across any portion of the Upper C-band that is allocated for terrestrial commercial wireless operations, as the Commission has done for other part 27 services since 2014. Specifically, we propose to add any such portion of the Upper C-band to section 27.75, which requires mobile and portable stations operating in the 600 MHz band and certain AWS-3 bands to be capable of operating across the relevant band using the same air interfaces that the equipment uses on any frequency in the band.[164] The Commission observed in the *2020 C-band R&O* that cross-band operability is important to ensure a robust equipment market for all licensees.[165] We seek comment on this proposal. Is there a reason not to apply section 27.75 to new terrestrial wireless licensees in the Upper C-band?

g. Protection of Incumbent FSS Earth Stations

66. For any repacked FSS operations in the C-band band after the proposed transition is complete, we propose to incorporate the existing incumbent protection measures that apply to 3.7 GHz Service operations in the Lower C-band and to apply them to new terrestrial wireless licensees in the Upper C-band. These measures include: (1) a PFD limit to protect registered FSS earth stations from out-of-band emissions from Upper C-band operations; (2) a PFD limit to protect against receiver blocking resulting from Upper C-band operations; and (3) allowing full band/full arc use of the Upper C-band by FSS earth stations.

67. To safeguard against out-of-band emissions, we propose to require a PFD limit of -124 dBW/m^2/MHz within the portion of the Upper C-band that will continue to be used for FSS operations, as measured at the registered incumbent earth station antenna.[166] As with the existing 3.7 GHz Service licensees in the Lower C-band, this PFD limit would apply to all emissions within the earth station's authorized band of operation, from both base and mobile stations.[167] The Commission concluded in the *2020 C-band R&O* that compliance with a PFD limit like the one we now propose was simpler and less burdensome on both FSS earth station licensees and on new licensees in the 3.7 GHz Service to implement than a power spectral density (PSD) limit would be.[168] We seek comment on this proposal in the instant context. Are the assumptions from the past proceeding accurate and applicable to our proposed licensing regime for the Upper C-band? If not, what alternative approaches should we consider, and what costs and benefits would such approaches entail?

68. In order to protect earth stations from receiver blocking, we propose to require a PFD limit of -16 dBW/m^2/MHz within the portion of the Upper C-band that is repurposed for terrestrial wireless use, as measured at the registered incumbent earth station antenna, and applied across the transitioned frequency range.[169] This blocking limit would apply to all emissions within the new terrestrial wireless licensee's authorized frequency range, and it is the same limit that we applied to protect earth stations during the Lower C-band transition.[170] Are the assumptions from the past proceeding accurate and applicable to our proposed licensing regime for the Upper C-band? If not, what alternative approaches should we consider, and what costs and benefits would such approaches entail?

69. Finally, we propose to allow full band/full arc use by FSS earth stations that continue to operate in the band during and after the transition process. In the *2020 C-band R&O*, the Commission

[164] *See* 47 CFR § 27.75(a)(3).

[165] *2020 C-band R&O*, 35 FCC Rcd at 2474, para. 358.

[166] *See 2020 C-band R&O*, 35 FCC Rcd at 2475–76, paras. 361–65.

[167] *See* 47 CFR § 27.1423(a).

[168] *2020 C-band R&O*, 35 FCC Rcd at 2475–76, para. 363.

[169] *See 2020 C-band R&O*, 35 FCC Rcd at 2476–78, paras. 366–71; 47 CFR § 27.1423(b).

[170] *See 2020 C-band R&O*, 35 FCC Rcd at 2478, para. 371.

noted the need to offer flexibility to earth stations that, in that proceeding, were transitioned above 4.0 GHz.[171] We seek comment on this proposal in the current context. Does the need for operational flexibility still recommend retention of full band/full arc use? What consequences would elimination of the policy hold for earth stations and for new terrestrial wireless licensees in the Upper C-band? Should we consider any alternative approaches, and what consequences such alternatives impose?

h. Protection of TT&C Earth Stations

70. In the *2020 C-band R&O*, the Commission established protection measures to safeguard Telemetry, Tracking, and Command (TT&C) operations throughout the C-band until such operations can be relocated to other bands.[172] Incumbent space station operators were required to identify and consolidate their TT&C operations to four locations within the contiguous United States by December 5, 2021, and the Commission indicated that it would not authorize any new TT&C operations elsewhere in CONUS, except to facilitate that consolidation.[173] TT&C operations are protected at the consolidated locations until December 5, 2030, in order to allow time for the launching of replacement satellites, and after that date TT&C operations may operate in the C-band on an unprotected basis.[174] The Commission also authorized private negotiation between incumbent space station operators and 3.7 GHz Service licensees regarding TT&C sites, including early entry of 3.7 GHz Service operations, and prolonged TT&C operations.[175]

71. Are there additional TT&C sites which were not identified for purposes of the Lower C-band transition that are active in the Upper C-band? If so, could operations at those sites be consolidated or co-located at already protected facilities? If additional sites are identified, should they be protected from harmful interference through December 5, 2030, consistent with our approach in the Lower C-band?

i. Co-channel Protection Criteria

72. We propose to maintain and apply existing co-channel protection criteria to safeguard TT&C operations in the C-band.[176] In the *2020 C-band R&O*, the Commission required 3.7 GHz Service licensees to ensure that the aggregated power from their operations meet an interference to noise ratio (I/N) of -6 dB as received by the TT&C earth station.[177] The Commission also required 3.7 GHz Service licensees to coordinate their co-channel operations within 70 km of TT&C earth stations that continued to operate in the Lower C-band.[178] The Commission observed in the *2020 C-band R&O* that there are few TT&C earth stations relative to other FSS earth stations, they are run by highly qualified technical staff, and that a coordination process accounting for terrain, shielding, polarization, and other technical parameters will result in adequate earth station protection and permit terrestrial use at a closer distance.[179] Further, the usual coordination process would presumably minimize the risk of harmful interference; this process includes the expectation the 3.7 GHz Service licensees take all practical steps necessary to protect TT&C operations, operate in good faith, and cooperate to resolve any interference issues via mutually

[171] *2020 C-band R&O*, 35 FCC Rcd at 2478–79, para. 372; *see also 2018 C-band NPRM*, 33 FCC Rcd at 6930, para. 40.

[172] *2020 C-band R&O*, 35 FCC Rcd at 2479, para. 373.

[173] *2020 C-band R&O*, 35 FCC Rcd at 2480, para. 375.

[174] *2020 C-band R&O*, 35 FCC Rcd at 2480, para. 376.

[175] *2020 C-band R&O*, 35 FCC Rcd at 2480, para. 377.

[176] *See* 47 CFR § 27.1423(c); *2020 C-band R&O*, 35 FCC Rcd at 2481–83, paras. 382–87.

[177] *2020 C-band R&O*, 35 FCC Rcd at 2481–82, para. 382.

[178] *2020 C-band R&O*, 35 FCC Rcd at 2481–82, para. 382.

[179] *2020 C-band R&O*, 35 FCC Rcd at 2482, para. 384.

satisfactory arrangements.[180]

73. We seek comment on our proposal to apply the existing co-channel protection criteria to TT&C operations throughout the C-band. Do the assumptions that the Commission made in the *2020 C-band R&O* regarding aggregated power and coordination distance remain accurate and applicable? Has the coordination framework proven to be sufficient and workable for affected operators? Have the protection criteria sufficed, both for 3.7 GHz Service licensees and for TT&C operations? Should we consider alternative protection criteria, and if so, what criteria would be appropriate? Commenters proposing alternatives should supply detailed technical information to support their positions.

j. Adjacent Channel Protection Criteria

74. We also propose to maintain existing criteria to protect TT&C operations in the C-band from adjacent channel interference due to out-of-band emissions,[181] including: (1) aggregated power from adjacent 3.7 GHz Service operations must meet a -6 dB I/N ratio, and the limit would apply to all emissions removed from the TT&C's center frequency by more than 150% of the TT&C's necessary emission bandwidth; (2) we would not require prior coordination between adjacent operations, but 3.7 GHz Service licensees and TT&C earth station operators would be expected to cooperate in good faith and make reasonable efforts to anticipate and resolve technical problems that may inhibit effective and efficient use of the spectrum; and (3) TT&C operators would be expected to make available pertinent technical information about their systems upon request by the 3.7 GHz Service licensees, and licensees of stations suffering or causing harmful interference would be expected to cooperate and resolve the problem by mutually satisfactory arrangements.[182]

75. To provide protection from potential receiver overload, we propose to require that: (1) base stations and mobile devices to meet a PFD limit of -16 dBW/m^2/MHz, as measured at the TT&C earth station antenna; (2) this blocking limit applies to all emissions within the 3.7 GHz Service licensee's authorized band of operation and protect TT&C earth stations based on the assumption that robust, custom filters have been installed at those facilities, like other FSS earth stations; (3) TT&C filter quality must provide a minimum of 60 dB of rejection, and the frequency at which the filter must meet this 60 dB of rejection would vary with the bandwidth; (4) TT&C filters must meet 60 dB of rejection for all frequencies removed from the center frequency by more than 150% of the TT&C's emission bandwidth, both above and below the channel; (5) the filter must provide 70 dB of rejection for all frequencies removed from the TT&C's center frequency by more than 250% of the TT&C's emission bandwidth, both above and below; and (6) in the event of a claim of harmful interference, the earth station operator must demonstrate that they have installed a filter that complies with the mask described above, and if they have not installed such a filter or are unable to make such a demonstration, and the 3.7 GHz Service licensee can confirm it meets the PFD, the TT&C operator would have to accept the interference.[183]

76. We seek comment on our proposal to maintain the existing adjacent channel interference protection criteria for TT&C operations. Do our previous assumptions regarding aggregated power, blocking protections, and the workability of the coordination framework remain true? What, if any, alternatives might be appropriate in light of the past several years of experience and technical developments?

k. Other Matters

77. Lastly, in its *NOI* comments, NTIA stated that in the 3.98–4.2 GHz band there are a limited number of radio astronomy sites that operate on an opportunistic basis (i.e., no primary

[180] *2020 C-band R&O*, 35 FCC Rcd at 2482, para. 384.

[181] *See* 47 CFR § 27.1423(d); *2020 C-band R&O*, 35 FCC Rcd at 2483–84, paras. 388–89.

[182] *2020 C-band R&O*, 35 FCC Rcd at 2483, para. 388.

[183] *See* 47 CFR § 27.1423(e); *2020 C-band R&O*, 35 FCC Rcd at 2483–84, para. 389.

allocation), primarily located in remote areas where natural isolation aids in mitigating interference.[184] We seek comment on whether we should take steps to facilitate coordination between wireless operations in the band and operations at these radio astronomy sites, including the costs and benefits of any proposed measures.

C. The Transition of FSS Operations

78. In the *2020 C-band R&O*, the Commission transitioned incumbent services out of the Lower C-band and into the upper 200 megahertz of the C-band by relying on the *Emerging Technologies* framework to facilitate the swift transition of spectrum from one use to another.[185] Specifically for incumbent FSS services, the Commission required overlay licensees to pay for the reasonable transition costs of eligible space station operators and incumbent earth station operators that were required to clear the lower 300 megahertz of the C-band spectrum in the contiguous United States.[186]

79. As discussed in further detail below, we propose adopting many of the same transition framework elements used for the Lower C-band for the Upper C-band transition of incumbent FSS operations.[187] We seek comment on this proposal. We also seek comment on whether there are any improvements that should be made to certain elements of the Lower C-band transition framework based on lessons learned during that process which will facilitate our efforts to meet Congress' mandate of completing a system of competitive bidding "for not less than 100 megahertz in the band between 3.98 gigahertz and 4.2 gigahertz" by July 4, 2027.[188] In addition, we seek comment on whether modifications to the elements of the transition framework are necessary to accommodate whatever reconfiguration option we elect for the Upper C-band.

1. Definition of Incumbent FSS Operations

80. In the *2020 C-band R&O*, the Commission defined the classes of incumbent FSS space station and earth station operations that would be transitioned out of the Lower C-band and reimbursed for their transition costs consistent with our *Emerging Technologies* precedent.[189] Identification of these

[184] NTIA Comments at 6–7.

[185] *See 2020 C-band R&O*, 35 FCC Rcd at 2391, para. 111. The Commission has relied on the *Emerging Technologies* framework since the early 1990s to facilitate the swift transition of spectrum from one use to another. *Id.* As noted *supra*, incumbent point-to-point FS operations in the entire C-band were sunset in the contiguous United States as of Dec. 5, 2023. *See 2020 C-band R&O*, 35 FCC Rcd at 2463–66, paras. 321–28; *see also* 47 CFR § 2.106(c)(182(iii)(B)); *id.* § 101.147(a)(8), (14), (25); *id.* § 101.803(d)(1).

[186] To effectuate the Lower C-band transition process, the Commission took a number of steps to encourage clearing and make spectrum available for an auction. First, it defined the class of incumbent earth stations and space stations expected to take part in the transition (and thus be eligible for cost reimbursement). Second, it laid out its legal authority to carry out the transition. Third, it set a deadline for clearing the band by 2025 while offering eligible space station operators the option to accelerate that process. Fourth, it set forth a cost reimbursement regime for incumbent operators making the transition and apportioned payment responsibility among the 3.7 GHz Service licensees. Fifth, it established a neutral, third-party clearinghouse to manage the financial aspects of the transition. Sixth, it set forth a logistical process for transitioning FSS operations out of the lower 300 megahertz of the band. Finally, the Commission addressed various procedural and technical issues related to the FSS transition. *See 2020 C-band R&O*, 35 FCC Rcd at 2391, para. 112.

[187] *See 2020 C-band R&O*, 35 FCC Rcd at 2391–2463, paras. 110–320; 47 CFR §§ 27.141122. A number of commenters to the *NOI* support using elements of the Lower C-band transition framework to clear Upper C-band for terrestrial wireless use. *See* Eutelsat Comments at 4–7; Eutelsat Reply at 1–2; SES Comments at 8–15; SES Reply at 1, 4, 6–10; Lynk Global Comments at 3–4; CCA Comments at 2–5; Verizon Comments at 8–9; Verizon Reply at 1–2; CTIA Reply at 9–11; T-Mobile Comments at 4; Ericcson Comments at 1, 3–4.

[188] OBBB Act, § 40002(b)(2).

[189] *2020 C-band R&O*, 35 FCC Rcd at 2391, para. 111.

incumbent FSS operations was an important step toward providing clarity about the transition process and informing auction bidders about the costs they would incur as a condition of their overlay license.[190] With these same goals in mind, below we seek comment on the appropriate definitions to identify the specific incumbent FSS space station and incumbent earth station operators that are relevant for purposes of the next proposed transition, using the Lower C-band model as a guide.

81. *Incumbent Space Station Operators*. For purposes of the Lower C-band transition, the Commission determined that "incumbent space station operators" would generally include all space station operators authorized to provide C-band service to any part of the contiguous United States pursuant to an FCC-issued license or grant of market access as of June 21, 2018.[191] On that date, the Commission's former International Bureau[192] issued a temporary freeze on certain new space station applications in order to preserve the landscape of authorized operations in the 3.7–4.2 GHz band, and that freeze remains in place.[193] At the time of the *2020 C-band R&O,* eight entities qualified under this definition, but since then certain of those entities have either ceased operations in the contiguous United States or merged with other incumbent space station operators.[194] Today, the remaining entities that qualify under this definition are: Empresa, Eutelsat, Hispasat, SES, and Telesat. We propose to use the same baseline definition of incumbent space station operators for purposes of the forthcoming Upper C-band transition, while accounting for any intervening changes in the legal or operational status of those entities since the Lower C-band transition, and seek comment on this proposal.

82. For purposes of transition cost reimbursement, the Commission defined an "eligible space station operator" as an incumbent space station operator that has demonstrated as of February 1, 2020, that it has an existing relationship to provide service via C-band satellite transmission to one or more incumbent earth stations in the contiguous United States.[195] At the time of the *2020 C-band R&O*, five of the incumbent space station operators qualified as 'eligible' under this definition.[196] Today, the

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[190] *2020 C-band R&O*, 35 FCC Rcd at 2391, para. 111 ("[B]idders need to know before an auction commences when they will get access to that currently occupied spectrum as well as the costs they will incur as a condition of their overlay license.").

[191] 47 CFR § 27.1411(b)(1); s*ee 2020 C-band R&O*, 35 FCC Rcd at 2391–92, para. 115.

[192] In January 2023, the Commission eliminated the International Bureau and reallocated its functions and authorities between the Space Bureau and the Office of International Affairs. *See generally Establishment of the Space Bureau and the Office of International Affairs and Reorganization of the Consumer Governmental Affairs Bureau and the Office of the Managing Director*, MD Docket No. 23-12, Order, 38 FCC Rcd 608 (2023).

[193] *See International Bureau Announces Temporary Filing Freeze on New Fixed Satellite Service Space Stations in the 3.7–4.2 GHz Band*, Public Notice, 33 FCC Rcd 6119 (IB Jun. 21, 2018) (*Space Station Freeze Public Notice*).

[194] In 2020, those entities were: ABS, Empresa, Eutelsat, Hispasat, Intelsat, SES, Star One (later renamed Embratel), and Telesat. *2020 C-band R&O*, 35 FCC Rcd at 2392, para. 115; *see, e.g.,* Embratel TVSAT Telecomunicações S.A., Quarterly Status Report (Q2 2023), GN Docket 18-122 (filed June 28, 2023) ("Embratel has exited the C-band market in the United States, no longer has any contractual obligations to provide C-band services in the United States, and has ceased operations from the Star One C1 satellite (call sign S2677) that was used to provide C-band."); *see also* Letter from Michelle C. Farquhar, Counsel to SES S.A., to Marlene H. Dortch, Secretary, FCC (July 17, 2025) (providing notice of consummation of the merger of SES S.A. and Intelsat Holdings, S.à.r.l.). ABS surrendered its authorization in May 2024.

[195] *See* 47 CFR § 27.1411(b)(2). The D.C. Circuit upheld the Commission's determination that certain smaller satellite operators were not entitled to reimbursement because they "provide[d] 'little to no service' in the C-band within the United States," nor did they show how they would either find new domestic customers or recruit existing business away from other providers. *PSSI Global Services, L.L.C. v. FCC*, 983 F.3d 1, 8 (D.C. Cir. 2020) (quoting *2020 C-band R&O*, 35 FCC Rcd at 2399–400, para. 135).

[196] In 2020, those entities were: Intelsat, SES, Telesat, Eutelsat, and Star One/Embratel. *2020 C-band R&O*, 35 FCC Rcd at 2426, para. 200. As noted *supra*, Embratel subsequently ceased providing C-band service in the United States, and Intelsat has merged with SES.

remaining entities that would qualify under this definition and continue to provide service to one or more incumbent earth stations within the contiguous United States are: Eutelsat, SES, and Telesat. We propose to use the same baseline definition of eligible space station operators for purposes of the forthcoming Upper C-band transition, with the requirement that each must still provide service to one or more incumbent earth stations within the contiguous United States, and seek comment on this proposal.

83. *Incumbent Earth Stations*. The Commission previously defined "incumbent earth stations" for the Lower C-band transition to include fixed and temporary fixed earth stations that were operational as of April 19, 2018, and that: (1) continue to be operational; (2) were licensed or registered in the ICFS database on November 7, 2018; and (3) timely certified the accuracy of the information on file with the Commission by May 28, 2019.[197] As with space stations, a freeze on the filing of new or modified earth station applications throughout the entire C-band was issued on April 19, 2018—the qualifying date for incumbency—and the freeze remains in place.[198] Throughout the Lower C-band transition, Commission staff continuously updated its list of incumbent earth stations found to qualify under these criteria,[199] the most recent of which was issued on September 18, 2025.[200]

84. We propose to retain the existing definition of incumbent earth stations for purposes of the Upper C-band transition, using the most recently released incumbent earth station list for the Lower C-band transition as the baseline going forward. We seek comment on this proposal, and any considerations we should keep in mind given the passage of time since the Lower C-band transition.

2. Clearing FSS Operations in the Upper C-band

85. As noted above, we propose to adopt rules to reconfigure the Upper C-band landscape. and to use our authority under section 316 of the Communications Act to modify, as needed, the existing licenses, market access authorizations, and registrations currently held by FSS C-band incumbents to clear whatever portion of the Upper C-band we ultimately reallocate.[201]

a. Clearing Space Station Operations

86. The One Big Beautiful Bill Act directs the Commission to grant licenses through a system of competitive bidding for at least 100 megahertz of the Upper C-band.[202] This directive necessitates modification of the space station operator licenses and market authorizations that operate in whatever portion of the band we ultimately reallocate. We again propose to use our authority under section 316 of the Communications Act to accomplish the legislative mandate in this context.[203] We also propose to further modify our existing rules to prohibit new applications for space station licenses and new petitions for market access concerning space-to-Earth operations in whatever portion of the band we reallocate in the contiguous United States.[204]

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[197] 47 CFR §§ 25.138(c), 27.1411(b)(3); *see also 2020 C-band R&O*, 35 FCC Rcd at 2392, para. 116.

[198] *See Temporary Freeze on Applications for New or Modified Fixed Satellite Service Earth Stations and Fixed Microwave Stations in the 3.7–4.2 GHZ Band*, Public Notice, 33 FCC Rcd 3841 (IB, PSHSB, WTB 2018).

[199] *See International Bureau Releases Preliminary List of Incumbent Earth Stations in the 3.7–4.2 GHz Band in the Contiguous United States*, IB Docket No. 20-205; GN Docket No. 20-305, Public Notice, DA 20-703 (IB July 6, 2020); *International Bureau Releases List of Incumbent Earth Stations in the 3.7–4.2 GHz Band in the Contiguous United States*, IB Docket No. 20-205; GN Docket No. 20-305, Public Notice, DA 20-823 (IB Aug. 3, 2020).

[200] *Space Bureau Releases Updated List of Incumbent Earth Stations in the 3.7–4.2 GHz Band in the Contiguous United States*, IB Docket No. 20-205; GN Docket No. 20-305, Public Notice, DA 25-864 (SB Sept. 18, 2025).

[201] *See* 47 U.S.C. § 316.

[202] *See* OBBB Act, § 40002(b)(2).

[203] *2020 C-band R&O*, 35 FCC Rcd at 2391–2408, 2463–67, paras. 110–53, 321–31.

[204] *2020 C-band R&O*, 35 FCC Rcd at 2394, 2407–08, paras. 124, 152–53; 47 CFR § 25.147.

87. As observed in the *2020 C-band R&O,* "[s]ection 316 of the Communications Act vests the Commission with broad authority to modify licenses 'if in the judgment of the Commission such action will promote the public interest, convenience, and necessity.'"[205] Here we similarly believe that modifying the authorizations of incumbent space station operators to clear at least 100 megahertz of the Upper C-band for auction as required by Congress is within the Commission's statutory authority, consistent with prior Commission practice, and will promote the public interest, convenience, and necessity by increasing the availability of wireless broadband services throughout the contiguous United States.[206] Commenters should explain any concerns with the proposed reconfiguration options, which were proposed in furtherance of a clear directive from Congress, and submit technical and other supporting documents to inform the Commission's consideration of these issues. We also seek comment on the extent to which implementation of our reconfiguration proposals in the instant *NPRM* align with the clearing approach taken in the Lower C-band transition.[207]

88. We also seek comment on the specific clearing targets, steps, and timing for any further FSS transition in the Upper C-band. Space station operators have indicated that greater use of advanced compression technologies, combined with the ongoing trend of customer migrations to alternative distribution mechanisms, means that a repacking and clearing of some portion of the Upper C-band might be achievable in a shorter timeframe than that required for the Lower C-band.[208] We seek additional input and specifics from the incumbent space station operators about their anticipated customer needs, the trajectory of their capacity demands, the extent of potential capacity gains that can be achieved by greater use of advanced compression, and any other factors and considerations relating to the potential future transition of their existing services. To the extent that any such information may be confidential or business sensitive in nature, we note that the incumbent space station operators may request confidential treatment of some or all of the information that they submit, consistent with the Commission's rules.[209]

b. Clearing Earth Station Operations

89. In the *2020 C-band R&O*, the Commission modified the registrations of receive-only earth stations but noted that, unlike transmitting space stations, they are not licensees.[210] Title III of the Communications Act (Act) requires a license for "the *transmission* of energy or communications or signals by radio."[211] The Commission has long concluded that, because receive-only earth stations do not transmit, they do not require a license under section 301 of the Communications Act. As such, past regulatory actions relating to receive-only earth stations have been predicated on our Title I ancillary authority as part of "other regulatory responsibilities to maximize effective use of satellite

[205] *2020 C-band R&O*, 35 FCC Rcd at 2394, para. 125.

[206] *2020 C-band R&O*, 35 FCC Rcd at 2394, para. 125.

[207] *See 2020 C-band R&O*, 35 FCC Rcd at 2394–96, paras. 124–28.

[208] SES Comments at 5–6 ("[L]ong-term industry trends suggest utilization is gradually declining over time . . . . This trend has been driven in part by technology improvements (e.g., advanced modulation schemes, improved compression algorithms, single-format transport) which have enabled 'the same video content to be transmitted over less spectrum.' At the same time, audiences and media content have been migrating from cable and broadcast to Internet-based streaming or 'over-the-top' ('OTT') services, with all major U.S. media content owners investing heavily in their own streaming platforms. This has reduced the overall number of channels that are being transmitted over C-band. Finally the expansion of terrestrial distribution networks, especially fiber, means that such networks are viable alternatives for media distribution."); SES Reply Comments at 4–5; Eutelsat July 28, 2025 *Ex Parte* Letter.

[209] *See* 47 CFR § 0.459.

[210] *2020 C-band R&O*, 35 FCC Rcd at 2406, para. 147.

[211] 47 U.S.C. § 301 (emphasis added).

communications" over which the Commission has express Title III authority.[212] The Commission is also empowered to make reasonable regulations to prevent harmful interference to and among its licensed users.[213] We thus have an ongoing responsibility to modify this registration regime for receive-only earth stations as appropriate to ensure that it remains consistent with our regulation, in the public interest, of the licensed satellite stations.

90. Accordingly, the Commission previously modified all necessary earth station registrations to comport with the Lower C-band reconfiguration adopted in the *2020 C-band R&O*.[214] Those modifications limited the frequencies on which incumbent earth stations may receive interference protection to the upper 200 megahertz of the C-band.[215] As the Commission further observed in the *2020 C-band R&O*, a relatively small number of earth stations that receive in the 4.0–4.2 GHz band are licensed to transmit in another band (i.e., licensed transmit-receive earth stations).[216] Those licenses to transmit do not provide the earth station operators with the right to do so in the C-band, where they hold no licensed spectrum usage rights. To the extent that certain incumbent earth stations have licenses to transmit in another band, we believe that we have ample authority to propose to modify their authorizations and their interference protection rights in the Upper C-band once incumbent satellite operations have been relocated consistent with our section 316 authority.[217] In light of the foregoing, we again propose to modify incumbent earth station registrations consistent with our regulation of the corresponding incumbent space stations, regardless of the reconfiguration option we ultimately adopt for the Upper C-band. We seek comment on this proposal. Commenters should explain any concerns with the proposed reconfiguration options, which were proposed in furtherance of a clear directive from Congress, and submit technical and other supporting documents to inform the Commission's consideration of these issues.

91. As noted by the incumbent space station operators, any transition of existing C-band services will necessarily impact and must be carefully coordinated with their customers.[218] That said, C-band utilization is gradually declining, particularly in terms of media content services, with C-band customers switching to alternative distribution technologies (including Ku-band, fiber, and content delivery networks) over time.[219] To this end, we seek additional information and input on how this trend

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[212] *See 2020 C-band R&O*, 35 FCC Rcd at 2406, para. 147 & n.415. Areas where the Commission has express Title III authority include our section 301 licensing and conditioning authority and section 303 authority to regulate radio transmissions in various specified ways. *Regulation of Domestic Receive-Only Satellite Earth Stations*, 74 F.C.C.2d 205, 217, para. 31 (1979); *see also Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed–Satellites at Reduced Orbital Spacings and to Revise Application Processing Procedures For Satellite Communications Services*, Report and Order, 6 FCC Rcd 2806 (1991); *Deregulation of Domestic Receive-Only Satellite Earth Stations*, Second Report and Order, 104 F.C.C.2d 348 (1986).

[213] *See* 47 U.S.C. § 302a.

[214] *See 2020 C-band R&O*, 35 FCC Rcd at 2406, para. 147; 47 CFR § 25.138.

[215] *See 2020 C-band R&O*, 35 FCC Rcd at 2406, para. 147; 47 CFR § 25.138(c).

[216] *See 2020 C-band R&O*, 35 FCC Rcd at 2406, para. 148.

[217] 47 U.S.C. § 316.

[218] SES Comments at ii ("Any transition of existing services, especially on an accelerated basis, will be complex and need to be carefully managed to ensure the long-term business continuity of SES's customers and minimize the impact on incumbent space station and earth station operations.").

[219] *SES/Intelsat Merger Order* at 9–16 ("[M]edia customers have several alternative distribution options, including terrestrial fiber networks, which have become increasingly competitive with their satellite-based services; and argue that changing video consumption patterns among consumers have reduced demand for traditional linear television service, and therefore, the Applicants' programming distribution services as well."); SES Comments at 5–6; SES Reply Comments at 4–5.

may impact any clearing of incumbent earth stations from the Upper C-band and on any considerations specific classes of earth station operators, including those in rural locations and with transportable facilities, may have.

3. Transition Schedule

92. We propose to set a specific transition deadline to ensure that all incumbent FSS operations are cleared in a timely manner to facilitate the introduction of terrestrial wireless services in the Upper C-band and to provide potential auction bidders with some certainty as to when they will be able to obtain access to Upper C-band spectrum. In the *2020 C-band R&O*, the Commission found that it was in the public interest to adopt a December 5, 2025 final deadline as it would ensure that Lower C-band spectrum would be made available for flexible use in a timely manner, while ensuring a smooth and predictable transition of incumbent FSS services to the upper 200 megahertz of the band.[220] The Commission also noted that setting a specific transition deadline would make sure that eligible space station operators, incumbent earth station operators, and other stakeholders have the necessary time to complete the transition in a careful, fair, and cost-effective manner.[221] In addition to setting a final transition deadline, the Commission also adopted a two-phased accelerated schedule for eligible space station operators in the Lower C-band who opted to transition on this basis in order to become eligible for certain incentives.[222]

93. We seek comment on whether a transition timeline of a similar length (i.e., approximately five-and-a-half years from the adoption of final rules) would be appropriate here as well and, if not, whether one or more different deadline(s) should be used. We invite commenters to indicate how quickly eligible space station operators and incumbent earth station operators will be able to transition their Upper C-band operations to make spectrum available for new terrestrial wireless licensees.[223] Specifically, commenters are encouraged to propose one or more FSS transition deadline(s) they believe to be achievable and to provide a step-by-step breakdown of what would be required from a technical and operational standpoint to achieve a transition in a timely manner, including but not limited to a description of the technical steps of repacking or relocating incumbent FSS services, any necessary compression equipment upgrades, and the need for construction and launch of any new satellites, along with the corresponding time frames for achieving each step.[224] Parties commenting on the transition timeline should address the extent of any transition-related information needed at particular points in time for potential bidders to participate effectively in an auction for any new licenses. Commenters proposing one or more specific spectrum clearing deadlines are also encouraged to indicate how their proposed deadline(s) might change under the band reconfiguration options under consideration, and how any in-band FSS transition timelines align with adjacent band considerations discussed *infra*. We also seek comment on whether to retain or modify the certification process by which eligible space station

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[220] *2020 C-band R&O*, 35 FCC Rcd at 2410–13, paras. 160–67; 47 CFR § 27.1412. The Commission found the Relocation Deadline of December 5, 2025—which was approximately five years and nine months from date of the *2020 C-band R&O* adoption—for Lower C-band to be wholly consistent with our precedent and past spectrum transitions. *Id.* at 2411–13, paras. 163–67; 47 CFR § 27.1412(a).

[221] *2020 C-band R&O*, 35 FCC Rcd at 2410, para. 160.

[222] The Accelerated Relocation Deadlines for eligible space station operators who opted in were December 5, 2021 for the lower 120 megahertz in 46 of the top 50 PEAs and December 5, 2023 for the lower 120 megahertz in all remaining PEAs, as well as the upper 180 megahertz nationwide. *2020 C-band R&O*, 35 FCC Rcd at 2413–14, paras. 168–72; 47 CFR § 27.1412(b).

[223] *See* SES Comments at 10–14; SES Reply at 4–5; Eutelsat July 28, 2025 *Ex Parte* Letter.

[224] *See, e.g.,* SES Comments at 7–8; Eutelsat Comments at 5; Eutelsat Reply at 3; Eutelsat July 28, 2025 *Ex Parte* Letter.

operators, on an individual basis, demonstrated compliance with the relevant Lower C-band deadlines,[225] and on the potential costs and penalties in the event that an incumbent space station operator fails to clear their existing services by any final transition deadline that we establish.[226] Further, we seek comment on the viability of private negotiations among relevant parties to accomplish earlier clearing than any deadlines established by the Commission.[227]

4. Transition Cost Reimbursement

94. As discussed in further detail *infra*, we propose to establish an FSS transition cost reimbursement structure that is generally consistent with the approach adopted by the Commission in the *2020 C-band R&O.*[228] That model required new terrestrial wireless licensees in the Upper C-band to reimburse the reasonable transition costs incurred by eligible FSS space station and incumbent earth station operators allocated the responsibility for those costs among the new terrestrial wireless licensees on a *pro rata* basis.[229] We further offered incumbent earth station operators the choice of either accepting reimbursement for their actual reasonable transition costs or accepting a lump sum reimbursement for *all* of their incumbent earth stations based on the average, estimated cost of transitioning those facilities.[230] We seek comment on the potential repurposing of these reimbursement mechanisms and standards in the instant context, as well as whether there are any improvements that could be made based on lessons learned from the Lower C-band transition process. We acknowledge that, depending on the reconfiguration option we ultimately adopt in the instant context, the transition of the Upper C-band may differ in some important respects from that in the Lower C-band including as to key transition actions and related costs incurred. As such, we also seek comment on estimates for the potential total amount of transition cost reimbursements for FSS services in the Upper C-band for a given clearing target, and how we may need to modify certain reimbursement mechanisms and standards depending on what reconfiguration approach we ultimately adopt and how incumbent services may be transitioned.[231]

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[225] *2020 C-band R&O*, 35 FCC Rcd at 2455–57, paras. 295–300; 47 CFR § 27.1412(g); *The Wireless Telecommunications Bureau Opens a New Docket and Establishes the Process for C-band Space Station Operator Phase I Certification of Accelerated Relocation*, Public Notice, 36 FCC Rcd 12359 (WTB 2021); *Wireless Telecommunications Bureau Announces Procedures for Filing of C-band Phase II Certifications of Accelerated Relocation and Implementation of the Commission's Incremental Reduction Plan for Phase II Accelerated Relocation Payments,* Public Notice, 38 FCC Rcd 4290 (WTB 2023).

[226] Incumbent space station operators that failed to clear their existing services by the final deadline for the Lower C-band transition would not be eligible to receive reimbursement for their reasonable transition costs or receive Accelerated Relocation Payments, and could also be subject to penalties for violation of the conditions of their license authorization. *See 2020 C-band R&O*, 35 FCC Rcd at 2414–15, paras. 173–77; 47 U.S.C. §§ 301, 503; 47 CFR §§ 1.80, 27.1411(b)(2), 27.1412(a), 27.1422(a).

[227] See *2020 C-band R&O*, 35 FCC Rcd at 2419, n.497.

[228] *See 2020 C-band R&O*, 35 FCC Rcd at 2414–31, 2445–46, paras. 173–210, 250–54. The Commission's authority to require transition cost reimbursements is well established. *See 2020 C-band R&O*, 35 FCC Rcd at 2416, paras. 180–81; 47 U.S.C. § 303(r); *see also* 47 U.S.C. § 154(i).

[229] *2020 C-band R&O*, 35 FCC Rcd at 2415–46, paras. 178–54; 47 CFR §§ 27.1418, 27.1420. We recognize that certain federal customers of commercial FSS services may not meet the eligibility standard previously adopted for Lower C-band and proposed here for Upper C-band, and in any event may not be able to receive reimbursements from third party, non-governmental entities pursuant to the Antideficiency Act and the Miscellaneous Receipts Act. 31 U.S.C. § 1341; 31 U.S.C. § 3302.

[230] *2020 C-band R&O*, 35 FCC Rcd at 2427–28, paras. 202–04; 47 CFR § 27.1419.

[231] Total cost reimbursements for the Lower C-band transition were \$3.38 billion. *See, e.g.*, Letter from Jason Chun, Counsel to Relocation Payment Clearinghouse LLC, to Susan Mort, Deputy Bureau Chief, Wireless Telecommunications Bureau, GN Docket No. 18-122 at Table 1 (filed July 18, 2025) (*July 2025 RPC Quarterly Report*).

95. *Compensable Transition Costs*. In the Lower C-band proceeding, the Commission set guidelines for compensable costs, i.e., those reasonable transition costs for which eligible space station operators and incumbent earth station operators were able to seek actual cost reimbursement.[232] In doing so, the Commission required all such transition costs to be reasonable, and indicated that such expenses would be compensable so long as they were both reasonable in cost and reasonably necessary to complete the transition in a timely manner.[233] While the Commission allowed reimbursement for the reasonable replacement cost of newer equipment needed to carry out the transition, it also indicated that it would not permit reimbursement for equipment upgrades beyond what was necessary to clear the lower portion of the band and cautioned incumbents against attempts to gold-plate their systems.[234] The Commission emphasized that compensable transition costs were only those that are reasonable and needed to transition *existing* operations in the contiguous United States out of the lower 300 megahertz of the C-band.[235] Consistent with this approach, and as relevant to the reconfiguration option we ultimately adopt in the instant proceeding, we propose to again require any actual transition costs needed to clear existing Upper C-band operations in the contiguous United States to be "reasonable" in order to qualify for reimbursement and will not permit reimbursement for equipment upgrades beyond what is necessary to clear the band.[236] We further seek comment on whether the type of reimbursable transition activities may differ in an Upper C-band transition, particularly as to current FSS C-band customers that may migrate to another satellite band or alternative delivery mechanism.[237] We also propose not to reimburse incumbents for the speculative value of any business opportunities they claim they would lose as a result of the transition, and any "soft costs" would again be subject to a rebuttable presumption for a cap of 2% of the hard costs involved in the transition.[238] We invite comment on this proposal, and on whether any clarifications or adjustments are needed to delineate what constitutes reasonable in the context of the forthcoming Upper C-band transition.

96. In this context, we seek comment on certain issues relating to compensable transition costs that were raised by stakeholders during the Lower C-band transition which may likewise be relevant for an Upper C-band transition depending on which reconfiguration option we ultimately adopt. As in the Lower C-band transition, to the extent that any unregistered earth stations, or registered earth stations that do not meet the existing definition of an incumbent earth station, remain operational in the C-band in the

[232] *2020 C-band R&O*, 35 FCC Rcd at 2422, para. 193.

[233] *2020 C-band R&O*, 35 FCC Rcd at 2423, para. 194.

[234] *2020 C-band R&O*, 35 FCC Rcd at 2422–23, paras. 194–95.

[235] *2020 C-band R&O*, 35 FCC Rcd at 2426, para. 200. In connection with this existing operations requirement, eligible space station operators must have demonstrated, no later than February 1, 2020, that it had an existing relationship to provide service via C-band satellite transmission to one or more incumbent earth stations in the contiguous United States. *Id*.; *see also* 47 CFR § 27.1411(b)(2).

[236] *See 2020 C-band R&O*, 35 FCC Rcd at 2422–28, paras. 193–204; 47 CFR § 27.1416.

[237] *2020 C-band R&O*, 35 FCC Rcd at 2422, para. 193. In the Lower C-band transition, consistent with Commission precedent, compensable costs included all reasonable engineering, equipment, site and FCC fees, as well as any reasonable, additional costs that the eligible space station operators and incumbent earth station operators incurred as a result of transitioning to the upper portion of the band. *Id.* For example, certain eligible space station operators needed to procure and launch new C-band satellites, in addition to the installation of compression and modulation equipment at their terrestrial facilities. *Id*. at 2425, para. 199. Transition work for incumbent earth station operators typically consisted of C-band earth station migration and filtering. *Id*. at 2426, para. 201.

[238] *2020 C-band R&O*, 35 FCC Rcd at 2423–25, paras. 196–98. For Lower C-band, the Commission stated that it would also allow reimbursement of some "soft costs"—"legitimate and prudent transaction expenses" incurred by incumbents "that are directly attributable" to relocation and established a rebuttable presumption that "soft" costs should not exceed a cap of 2% of the relocation hard costs involved. "Soft costs" were defined as transactional expenses directly attributable to relocation, to include engineering, consulting, and attorney fees, as well as costs of acquiring financing for clearing costs. *Id.* at 2424, paras. 197–98.

contiguous United States, our intent is that such stations would *not* be eligible for reimbursement of transition costs in the Upper C-band transition. We similarly clarify our intent that—assuming that the Upper C-band transition is limited to operations in CONUS, as proposed—earth stations outside CONUS but within the United States would only be eligible for reimbursement of transition costs where they "demonstrate that they were required to make the system modifications for which they seek reimbursement as a direct result of the transition in the contiguous United States."[239] Further, we propose that costs associated with facilities outside the United States would *not* be eligible for any reimbursement of transition costs, independent of any arguable relationship to the transition in the contiguous United States.[240] To be clear, with the limited exception referenced above for earth stations within the United States but outside the contiguous United States, the only C-band earth stations that we propose would be eligible to have any reasonable transition costs reimbursed in connection with the Upper C-band transition are those within the contiguous United States that meet the proposed incumbent earth station definition, are currently on the most recent incumbent earth station list released by the Space Bureau, and that remain on any successor lists issued in the future. In a similar vein, we clarify our intent that any incumbent space station operators seeking reimbursement for new satellites may only seek reimbursement for reasonable transition costs that directly relate to and are necessary to continue to offer C-band service to one or more incumbent earth stations in the contiguous United States. As such, for any new satellites that may carry other payloads, transmit using other spectrum bands, or transmit C-band service into locations outside the contiguous United States, we anticipate that the only costs which will be compensable are those directly relating to the transition of C-band services in the contiguous United States.[241] We seek comment on this approach, and how it might align with the different reconfiguration options under consideration, and the potential migration of existing C-band customers to Ku-band satellite service or other distribution technologies.

97. *Lump Sum Reimbursement Option.* As noted *supra*, in the *2020 C-band R&*O, the Commission provided incumbent earth station operators with the choice to either accept reimbursement for their actual reasonable transition costs in maintaining C-band satellite reception, or instead accept a lump sum reimbursement based on the average, estimated costs of transitioning *all* of their incumbent earth stations.[242] The decision to accept a lump sum reimbursement was irrevocable—by accepting the lump sum, the incumbent took on the risk that the lump sum would be insufficient to cover all its relocation costs—to ensure that incumbents had the appropriate incentive to accept the lump sum only if doing so is truly the more efficient option.[243] Earth station operators that elected the lump sum payment and were intending to remain operating in the band were responsible for performing any necessary transition actions themselves, and they were required to complete any such work consistent with the space station operator's deadlines for transition.[244]

98. We propose to give incumbent earth station operators the same choice in the instant transition to opt out of the formal transition process through a lump sum reimbursement option,[245] and seek comment on whether we should again utilize the lump sum categories and general procedures set

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[239] *2020 C-band R&O*, 35 FCC Rcd at 2428, para. 204; *Cost Category PN* at 7968, 7996, n.2, Attach. A, n.1.

[240] *See, e.g.*, *2020 C-band R&O*, 35 FCC Rcd at 2425, n.535.

[241] For example, any general costs (including, but not limited to, construction and launch) of such new satellites must be apportioned on a *pro rata* basis such that only those costs directly relating to the provision of C-band services to one or more incumbent earth stations in the contiguous United States as part of the instant transition would be compensable.

[242] *2020 C-band R&O*, 35 FCC Rcd at 2427–28, paras. 202–04; 47 CFR § 27.1419.

[243] *2020 C-band R&O*, 35 FCC Rcd at 2427–28, paras. 202–04.

[244] *2020 C-band R&O*, 35 FCC Rcd at 2427–28, paras. 202–04.

[245] *See 2020 C-band R&O*, 35 FCC Rcd at 2422–28, paras. 193–204; 47 CFR § 27.1419.

forth in our cost category schedule (Cost Catalog) for the Lower C-band transition.[246] Proponents of any changes to the lump sum reimbursement option should describe both the scope of intended lump sum reimbursements as well as any new basis upon which to calculate the lump sum amounts, or other adjustments thereto, such as for inflation. For example, should lump sum payments now be premised on the cost of potentially moving incumbent earth station operators to an alternate distribution technology? How might the scope of lump sum reimbursements differ under the band reconfiguration options we are considering for Upper C-band? Could a modified and expanded lump sum regime essentially replace or obviate the need to reimburse actual costs, resulting in a more streamlined and efficient cost reimbursement program? We encourage commenters to submit detailed breakdowns of any potential alternative approaches to the lump sum option and also describe in detail the methodology they would use to determine an appropriate lump sum payment in lieu of actual cost reimbursement for incumbent earth station operators in the instant context.

99. *Allocating Payment Obligations Among Overlay Licensees*. For Lower C-band, the Commission explained the financial responsibilities that each 3.7 GHz Service licensee would incur to reimburse incumbent space station operators for clearing the band, as well as our authority to require such payments as license conditions on the new 3.7 GHz Service licensees consistent with our *Emerging Technologies* precedent.[247] Specifically, the Commission found it reasonable to generally base the share for each 3.7 GHz Service licensee on that licensee's *pro rata* share of gross winning bids in the underlying auction, with specific allocation formulas governing each type of payment obligation.[248] We propose to utilize the same general payment obligation structure and mechanisms used in Lower C-band and to again base the share of transition costs for each new 3.7 GHz Service licensee on that licensee's *pro rata* share of gross winning bids in the competitive bidding process.[249] We seek comment on this proposal. Commenters are invited to recommend alternative approaches with a detailed description of the methodology behind their proposals. Would our methodology for allocating payment obligations have to be modified based on whatever reconfiguration option we adopt for the Upper C-band?

5. Incentives

100. We seek comment on the possible use of incentives to facilitate the timely introduction of new terrestrial wireless operations in the Upper C-band. For example, in the Lower C-band, the Commission used incentives in the form of accelerated relocation payments[250] to eligible space station operators that voluntarily committed to relocate on an accelerated two-phase schedule and met those deadlines.[251] The use of accelerated relocation payments to incentivize eligible space station operators to

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[246] *See Wireless Telecommunications Bureau Releases Final Cost Category Schedule for 3.7–4.2 GHz Band Relocation Expenses and Announces Process and Deadline for Lump Sum Elections*, GN Docket No. 18-122, IB Docket No. 20-205, Public Notice, 35 FCC Rcd 7967, at 7976–93, 8012–13, paras. 16–41, Attach. A, Sec. E (WTB July 30, 2020) (*Cost Category PN*).

[247] *2020 C-band R&O*, 35 FCC Rcd at 2415–22, paras. 178–92; 47 CFR § 27.1418 (Payment Obligations).

[248] *2020 C-band R&O*, 35 FCC Rcd at 2445–46, paras. 250–54; 47 CFR § 27.1420 (Cost-sharing formula). The Commission indicated that this approach was similar to its approach in the H-Block proceeding, where the Commission also used a *pro rata* cost-sharing mechanism based on gross winning bids. *Id.*

[249] *See 2020 C-band R&O*, 35 FCC Rcd at 2422–28, paras. 193–204; 47 CFR § 27.1419.

[250] In addition to reimbursement for their transition costs, incumbent space station operators that opted for accelerated relocation and satisfied the two Accelerated Relocation Deadlines were also eligible to receive specific Accelerated Relocation Payments paid for by the new 3.7 GHz Service licensees as a condition of their authorizations. *2020 C-band R&O*, 35 FCC Rcd at 2414, 2431–45, paras. 174, 211–49; 47 CFR §§ 27.1412(b), 27.1422.

[251] *2020 C-band R&O*, 35 FCC Rcd at 2408, para. 155; 47 CFR § 27.1412(b)(1)–(2). The Commission found that making the spectrum available to a licensee earlier increases the potential producer surplus earned by the licensee

(continued….)

voluntarily relocate by early clearance benchmarks sought to leverage the technical and operational knowledge of incumbent space station operators, align their incentives to achieve a timely transition, and enable that transition to begin as quickly as possible.[252] As further incentive, the Commission determined that eligible space station operators which failed to clear their existing C-band services out of the lower band by either of the Accelerated Relocation Deadlines would receive an incremental reduction in the amount of accelerated relocation payment based on the number of days that had passed since the deadline, with a payment of zero after more than 180 days.[253]

101. Given the different circumstances in the Upper and Lower C-band—including the scope and scale of parties that may be seeking transition cost reimbursement as well as the timing of any adjacent band altimeter retrofits—would a similar incentive structure be appropriate for eligible incumbent space station operations in the forthcoming transition process? Will successful completion of the Upper C-band transition to terrestrial wireless services be primarily dependent on the expeditious clearing of incumbent FSS operations or will other factors and other parties be the primary drivers of the transition timeline? In light of these different considerations, what is the economic value of accelerating the FSS transition in this instance? We encourage parties supporting incentives for eligible incumbent space station operators in the Upper C-band to submit detailed arguments, including cost-benefit analyses, underlying their perspectives.

102. We also seek comment more generally on whether we should consider incentives—monetary or otherwise—to facilitate expeditious clearing of the Upper C-band. If so, who should be eligible for such incentives, how should any responsibility thereto be allocated, and what benchmarks should they be aligned with? If monetary in nature, how should such incentives be calculated, and should there be any reduction or elimination of incentives if the requisite deadlines are missed? Commenters should also indicate how such an estimate would be impacted by either of the band reconfiguration options we are considering. For example, should any incentives hinge on the amount of spectrum to be cleared?

6. Relocation Payment Clearinghouse

103. Consistent with our approach in the earlier transition, we propose to again use an independent Clearinghouse to oversee the cost-related aspects of the eventual Upper C-band transition, using a similar selection process and imposing the same broad responsibilities that were outlined in the *2020 C-band R&O*.[254] The Commission there noted that selecting an independent third party for this purpose, subject to the Commission's rules and oversight, would help to ensure fairness and transparency in the handling of the reimbursement obligations associated with the Lower C-band transition.[255] At the time, the Commission observed that it had previously and successfully adopted cost-sharing plans that utilized private clearinghouses to administer such reimbursement obligations among affected licensees.[256] We believe, based on the experience of the earlier C-band transition, that such an approach would once again be in the public interest here. We seek comment on this proposal and on ways to build upon the

(Continued from previous page)
because it can begin to provide services to consumers on that spectrum sooner, thereby granting a specific commercial benefit to a new overlay licensee. *Id.* at 2432, para. 216.

[252] *2020 C-band R&O*, 35 FCC Rcd at 2413, para. 169. In Lower C-band, all five eligible space station operators elected accelerated relocation. *Wireless Telecommunications Bureau Announces Accelerated Clearing in the 3.7–4.2 GHz Band*, GN Docket No. 18-122, Public Notice, 35 FCC Rcd 5517 (WTB 2020).

[253] *2020 C-band R&O*, 35 FCC Rcd at 2414, para. 174; 47 CFR § 27.1422(d).

[254] *2020 C-band R&O*, 35 FCC Rcd at 2446–52, paras. 255–83; 47 CFR §§ 27.1414–1422.

[255] *2020 C-band R&O*, 35 FCC Rcd at 2446, para. 255.

[256] *2020 C-band R&O*, 35 FCC Rcd at 2446–47, para. 258 (citing 47 CFR § 27.1162).

success of the Lower C-band Clearinghouse in terms of potential improvements to any new transition cost reimbursement program.

a. Duties of the Clearinghouse

104. In the *2020 C-band R&O*, the Commission established that a Clearinghouse would be responsible for carrying out four categories of essential duties in connection with overseeing the financial aspects of the Lower C-band transition. We propose to task any new Clearinghouse that is ultimately selected to oversee the financial aspects of the Upper C-band transition with broadly the same responsibilities, described in more detail below.

105. First, the Commission charged the Clearinghouse with collecting from all eligible space station operators and incumbent earth station operators a showing of their transition relocation costs, as well as a demonstration of those costs' reasonableness.[257] Parties submitted their costs to the Clearinghouse directly, which then ascertained in the first instance whether the costs were reasonable, and allowed submitting parties to supplement claims initially deemed insufficient.[258] Entities seeking reimbursement were required to document all of their costs, and to justify them; these entities were subject to audits and required to make all relevant documentation available to the Clearinghouse upon its request.[259] The Clearinghouse notified requesting parties in the event that it deemed any claimed costs to be unreasonable, and the Wireless Telecommunications Bureau was empowered to make further determinations related to reimbursable costs, as necessary, throughout the transition process.[260]

106. Second, the Clearinghouse was tasked with apportioning costs among new 3.7 GHz Service licensees and distributing payments to eligible space station operators, incumbent earth station operators, and appropriate surrogates of those parties that incurred compensable costs.[261] After the auction, the Clearinghouse calculated each 3.7 GHz Service licensee's estimated share of the eventual relocation costs, as well as an estimate of total costs from before the auction through the first six months after it was complete.[262] Licensees paid their shares of the initial cost estimate into the Clearinghouse-administered relocation fund shortly after the auction was complete, and the Clearinghouse drew from that fund to reimburse approved claims.[263] The Clearinghouse calculated the estimated total program costs for every six-month period until the transition was complete, notified the 3.7 GHz Service licensees of their amounts owed at least 30 days before every six-month payment deadline, and reimbursed approved claims within 30 days of invoice submissions.[264] The Clearinghouse included its own reasonable costs in its six-month estimates and provided an annual financial audit to the Office of the Managing Director and the Wireless Telecommunications Bureau including those costs, which were paid by 3.7 GHz Service licensees once their licenses were issued.[265]

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[257] *See 2020 C-band R&O*, 35 FCC Rcd at 2447, para. 260; 47 CFR §§ 27.1415–1416.

[258] *2020 C-band R&O*, 35 FCC Rcd at 2447, para. 260; 47 CFR §§ 27.1415–1416(a).

[259] *2020 C-band R&O*, 35 FCC Rcd at 2447–48, para. 261; 47 CFR §§ 27.1415–1416(a).

[260] *2020 C-band R&O*, 35 FCC Rcd at 2448, para. 262; 47 CFR § 27.1416(a).

[261] *2020 C-band R&O*, 35 FCC Rcd at 2448, para. 263; 47 CFR §§ 27.1418–1420. We again expect that the new Clearinghouse will enter into one or more appropriate contracts with eligible space station operators, new terrestrial wireless licensees, and their agents or designees. *2020 C-band R&O*, 35 FCC Rcd at 2451, para. 279.

[262] *2020 C-band R&O*, 35 FCC Rcd at 2448, para. 263; 47 CFR §§ 27.1417–18.

[263] *2020 C-band R&O*, 35 FCC Rcd at 2448, para. 263; 47 CFR §§ 27.1417–18.

[264] *2020 C-band R&O*, 35 FCC Rcd at 2448, para. 264; 47 CFR §§ 27.1417–18.

[265] The audited statement was required to follow generally accepted accounting procedures (GAAP) or generally accepted government auditing standards (GAGAS). *2020 C-band R&O*, 35 FCC Rcd at 2449, para. 267, n.659; 47 CFR §§ 27.1414(c)(2), 1417–18.

107. Third, the Clearinghouse was directed to, as needed, act as a special master and either mediate disputes related to cost estimates or payments, or refer the parties to alternate dispute resolution fora.[266] The Commission also provided for expedited non-binding arbitration, with costs shared by the disputing parties, and for review of any disputes by the Wireless Telecommunications Bureau, with the opportunity for further review on appeal to the Commission.[267]

108. Fourth, the Clearinghouse was required to provide quarterly information and progress reports to the Commission in order to ensure proper oversight of the Clearinghouse program.[268] These reports included information related to available funds for reimbursement, payments issued, amounts collected from licensees, incumbents' certifications, funds spent on the transition, and description of any disputes and their resolutions.[269] The Clearinghouse was also required to provide additional information upon the request of the Wireless Telecommunications Bureau and the Office of the Managing Director.[270]

109. We propose to task a new independent third-party Clearinghouse with these same broad duties for the Upper C-band transition, and we seek comment on this proposal. Should we retain the basic structure of the processes by which the new 3.7 GHz Service licensees will replenish the reimbursement fund[271] and eligible incumbents submit reimbursement claims for their reasonable transition costs? We again anticipate that each eligible space station operator will be responsible for payment of its own satellite transition costs until the new terrestrial wireless licensees are determined, and those licensees will pay the Clearinghouse's costs throughout the reimbursement program, and thus seek comment on those proposals.[272] Did the dispute resolution process resolve any open issues in a timely manner, or would additional alternative dispute resolution options or a more streamlined appeals process from the Wireless Telecommunications Bureau directly to the Commission facilitate the expeditious resolution of such matters? Were the quarterly Clearinghouse reporting requirements sufficient for the Commission to carry out its transition oversight duties, or would a different cadence of filings serve the same goal? Did the experience of the Lower C-band transition offer any other lessons that should guide us to adopt alternative approaches to any of the duties described above? If so, what are those alternatives,

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[266] *2020 C-band R&O*, 35 FCC Rcd at 2449, para. 268; 47 CFR § 27.1421.

[267] *2020 C-band R&O*, 35 FCC Rcd at 2449, paras. 268–69; 47 CFR § 27.1421.

[268] *2020 C-band R&O*, 35 FCC Rcd at 2450, para. 270; 47 CFR § 27.1414(c).

[269] *2020 C-band R&O*, 35 FCC Rcd at 2450, para. 270; 47 CFR § 27.1414(c); *see, e.g.*, *July 2025 RPC Quarterly Report*.

[270] *2020 C-band R&O*, 35 FCC Rcd at 2450, para. 271; 47 CFR § 27.1414(c). When the prohibition in 47 CFR 1.2105(c) applied to competitive bidding for licenses in the 3.7 GHz Service, the Clearinghouse was also required to make real time disclosures of the content and timing of and the parties to communications, if any, from or to applicants to participate in competitive bidding, as defined by 47 CFR 1.2105(c)(5)(i). 47 CFR § 27.1414(b)(4)(i). We propose to adopt the same requirement here.

[271] To the extent that a new terrestrial wireless licensee relinquishes to the Commission its license prior to all its transition payment responsibilities being discharged, we again propose that the remaining payments will be distributed among other similarly situated new terrestrial wireless licensees. If a new license is issued for such previously relinquished rights prior to final payments becoming due, we propose that the new licensee will be responsible for the same *pro rata* share of the payment obligations as the initial terrestrial wireless licensee. Finally, if a new terrestrial wireless licensee sells its rights on the secondary market, we propose that the new licensee will be obligated to fulfill all payment obligations associated with the license. *2020 C-band R&O*, 35 FCC Rcd at 2449, para. 266; 47 CFR § 27.1418(d).

[272] *2020 C-band R&O*, 35 FCC Rcd at 2449, para. 267; 47 CFR § 27.1418(a), (b)(4). We note that in Lower C-band, eligible space station operators that elected accelerated relocation voluntarily committed to paying the administrative costs of the Clearinghouse until the Commission awarded licenses to the new 3.7 GHz Service licensees, at which time those administrative costs were repaid to those eligible space station operators. *2020 C-band R&O*, 35 FCC Rcd at 2449, para. 291.

and why should we depart from our previous practice? For example, are there ways in which the new Clearinghouse could streamline the claims review process without compromising its duty to prevent fraud, waste, or abuse in the transition cost reimbursement program? Would any additional Clearinghouse duties, not contemplated in the Lower C-band transition, be useful in administering the cost aspects of the Upper C-band transition?

110. As part of the earlier transition, the Commission directed Wireless Telecommunications Bureau to establish a Cost Catalog which provided guidance to both incumbents and the new 3.7 GHz Service licensees about a range of reasonable transition costs.[273] The Cost Catalog also detailed the process and relevant categories for incumbent earth station operators opting out of the formal transition and seeking a lump sum payment.[274] Consistent with this approach, reimbursement claims that fell within the applicable range in the Cost Catalog were presumed reasonable.[275] Should we once again utilize a Cost Catalog to establish ranges of presumptively reasonable transition costs? If so, should we retain the existing Cost Catalog, adjust it in some way (such as for inflation), or develop an entirely new one for the Upper C-band transition? If we again direct the Wireless Telecommunications Bureau to develop a new Cost Catalog or modify the existing one, how should we develop appropriate ranges identifying presumptively reasonable reimbursement claims?

b. Selecting the Clearinghouse

111. We propose to appoint a search committee tasked with selecting the Clearinghouse for the Upper C-band transition. As in the *2020 C-band R&O*, we propose to establish a search committee that: (1) represents various stakeholder interests, including space station operators, earth station incumbents, and prospective flexible-use licensees; (2) proceeds by consensus, and, if necessary, selects the Clearinghouse by a majority vote; and (3) notifies the Commission of its choice by an established deadline.[276] In order to streamline the search committee process, in contrast with the lower band transition where the search committee established the Clearinghouse's selection criteria,[277] here we propose the use of selection criteria based upon the Clearinghouse's duties as discussed *supra*.[278] Upon the selection of a Clearinghouse, we propose to direct the Wireless Telecommunications Bureau to issue a public notice seeking comment on whether the entity selected satisfies the selection criteria, and to issue a final order announcing whether the selection criteria has been satisfied.[279] We further propose to again

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[273] *Cost Category PN* at 7968, para. 2.

[274] *Cost Category PN* at 7976–93, paras. 16–41.

[275] *2020 C-band R&O*, 35 FCC Rcd at 2448, para. 262.

[276] *See 2020 C-band R&O*, 35 FCC Rcd at 2451–52, paras. 279–80.

[277] *See 2020 C-band R&O*, 35 FCC Rcd at 2451, paras. 275–78; 47 CFR § 27.1414(a)(2).

[278] We also propose to integrate certain search committee requirements from the Lower C-band transition more formally into Clearinghouse duties here, including the requirements for the Clearinghouse in administering the transition to: (1) engage in strategic planning and adopt goals and metrics to evaluate its performance; (2) adopt internal controls for its operations; (3) use enterprise risk management practices; (4) use best practices to protect against improper payments and to prevent fraud, waste, and abuse in its handling of funds; (5) create written procedures in its operations, using the GAO Green Book to serve as a guide; (6) adopt robust privacy and data security best practices in its operations, comply with, on an ongoing basis, all applicable laws and federal government guidance on privacy and information security requirements such as relevant provisions in the Federal Information Security Management Act, National Institute of Standards and Technology publications, and Office of Management and Budge guidance; and (7) hire a third-party firm to independently audit and verify on an annual basis its compliance with privacy and information security requirements and to provide recommendations based on any audit findings, to correct any negative audit findings, and adopt any additional practices suggested by the auditor and report the results to the Bureau. *2020 C-band R&O*, 35 FCC Rcd at 2451, paras. 276–77; 47 CFR § 27.1414(b)(2)–(4).

[279] *See 2020 C-band R&O*, 35 FCC Rcd at 2451, para. 280.

direct and delegate broad authority to the Wireless Telecommunications Bureau to provide the Clearinghouse and incumbent space station operators with any needed clarifications and interpretations of the Commission's orders and rules, and more generally to take such measures as are necessary to ensure the timely and efficient transition of the Upper C-band.[280]

112. We seek comment on our proposal to adopt for the Upper C-band transition a process broadly similar to that used to select the Clearinghouse for the Lower C-band transition, with certain proposed modifications as detailed above. What lessons from the previous transition might inform the composition of the search committee, the substance of the selection criteria, or the procedures for, and timing of, the Clearinghouse's selection? We also seek comment on what should happen in the event that the search committee fails to select a Clearinghouse and notify the Commission by the deadline, including but not limited to procedures similar to those used in the Lower C-band transition?[281]

7. The Logistics of Relocation

113. In order to relocate incumbent FSS operations out of the reconfigured portion of the Upper C-band, we propose to adopt requirements similar to those that governed the transition of FSS operations out of the Lower C-band.[282] We therefore propose to require: (1) the preparation and submission of Transition Plans by the eligible space station operators; (2) a filing deadline for the submission of such Transition Plans, to be followed by a public comment period and the opportunity to update the plans as permitted by the Commission; (3) requirements for the content of eligible satellite operators' Transition Plans; and (4) the submission of quarterly status reports by the eligible space station operators on their implementation efforts; and (5) the selection and appointment of a Relocation Coordinator to ensure that relocation is completed in a timely manner.[283]

114. The Commission previously found that the eligible space station operators possessed the technical and operational expertise that was required to facilitate the transition of FSS services out of the Lower C-band, and that putting them in charge of practical transition logistics—with Commission oversight—would be the most effective approach.[284] Such operators were required to submit formal Transition Plans roughly three months after the Commission adopted the *2020 C-band R&O*, and the public was allowed to comment on those plans.[285] The Commission required that the Transition Plans describe seven items in detail.[286] Should we once again make the eligible space station operators

[280] *See 2020 C-band R&O*, 35 FCC Rcd at 2452, paras. 280, 282; 47 CFR §§ 27.1412(h), 27.1414(a)(5), 27.1416(a).

[281] *See 2020 C-band R&O*, 35 FCC Rcd at 2452, para. 281.

[282] *See 2020 C-band R&O*, 35 FCC Rcd at 2457–59, paras. 302–06; 47 CFR § 27.1412.

[283] *See 2020 C-band R&O*, 35 FCC Rcd at 2457–61, paras. 302–17; 47 CFR §§ 27.1412(d)–(f), 27.1413.

[284] *2020 C-band R&O*, 35 FCC Rcd at 2454, para. 287. Further, eligible space station operators electing accelerated relocation took responsibility for relocating their associated incumbent earth stations by those same deadlines, although they were not held responsible for any incumbent earth station transition delays beyond their control so long as they gave notice to the Wireless Telecommunications Bureau within seven days of discovering an inability to accomplish the assigned earth station transition task. *Id*. at 2455, paras. 292–94.

[285] *2020 C-band R&O*, 35 FCC Rcd at 2457, para. 302.

[286] The required content included: (1) descriptions of all existing space stations with operations that would need to be repacked in the Upper C-band; (2) the number of new satellites the operator would need to launch to maintain sufficient capacity after the transition and a description of why they are necessary; (3) a specific grooming plan for migrating services into the new spectrum, including pre- and post-transition frequencies each customer would occupy; (4) any necessary technology upgrades or other solutions the operator would implement; (5) the number and location of earth stations that would need to be transitioned; (6) an estimate of the number of earth stations that would need retuning or repointing to receive content on new transponder frequencies after the transition; and (7) the specific timeline for implementing the actions described in (2) through (6). *See 2020 C-band R&O*, 35 FCC Rcd at 2458, para. 303; 47 CFR § 27.1412(d).

responsible for both establishing and satisfying their clearing obligations? If so, should we adopt similar deadlines and content requirements for eligible space station operators' Transition Plans and status reports, and enable the filing of joint Transition Plans by multiple operators who deem it useful to develop a combined space station grooming plan, as long as it includes all of the required elements? Depending on the reconfiguration option we ultimately adopt, would any changes to the relocation process be appropriate?

115. The Commission previously determined that the establishment of a Relocation Coordinator to oversee the FSS transition was in the public interest, upon a demonstration of its expertise.[287] Should we take the same approach to ensure the timely execution of the Upper C-band transition, or might a different approach be warranted depending on which reconfiguration option is adopted? Should we again establish a search committee of interested parties to select the Relocation Coordinator, or would another approach better suit this transition?[288] What lessons from the Lower C-band transition might inform our approach to using a Relocation Coordinator for this effort? Should the Relocation Coordinator's selection process and responsibilities remain essentially the same as before, or might they change depending on which reconfiguration approach we select?[289]

D. Coexistence with Adjacent Band Radio Altimeters

116. In light of our statutory mandate to complete a system of competitive bidding for licenses for at least 100 megahertz of the Upper C-band by July 4, 2027, we seek comment on how best to promote spectral coexistence between these proposed new wireless services and radio altimeters in the neighboring 4.2–4.4 GHz band.[290] Since this issue was first addressed in the *2020 C-band R&O,*[291] there has been significant technical work done by government and industry stakeholders to better understand any potential for harmful adjacent band interference.[292] In addition, temporary measures were adopted by

[287] *See 2020 C-band R&O*, 35 FCC Rcd at 2459, paras. 307–17; 47 CFR § 27.1413. When the prohibition in 47 CFR 1.2105(c) applied to competitive bidding for licenses in the 3.7 GHz Service, the Relocation Coordinator was also required to make real time disclosures of the content and timing of and the parties to communications, if any, from or to applicants to participate in competitive bidding, as defined by 47 CFR 1.2105(c)(5)(i). 47 CFR § 27.1413(c)(6). We propose to adopt the same requirement here.

[288] *See 2020 C-band R&O*, 35 FCC Rcd at 2459–60, paras. 308, 311.

[289] *See 2020 C-band R&O*, 35 FCC Rcd at 2460–61, paras. 311–15. These responsibilities included, for instance, establishing a timeline for migration of incumbent earth stations, reviewing the eligible space station operator Transition Plans and recommending changes to the Commission, coordinating with 3.7 GHz Service Licensees, receiving notice of disputes regarding comparability of services, workmanship, or preservation of service during the transition, and quarterly reporting on the overall status of the transition effort. *Id*.; 47 CFR § 27.1413(c)–(d).

[290] OBBB Act, § 40002(b)(2).

[291] Similar issues were addressed in the *2020 C-band R&O* with respect to the introduction of the 3.7 GHz Service in the Lower C-band, where the Commission concluded that the adoption of specific technical operating rules for that service, in combination with the spectral separation between it and radio altimeters, would offer "all due protection to services in the 4.2–4.4 GHz band." *2020 C-band R&O*, 35 FCC Rcd at 2485, para. 395. The Commission also encouraged members of the aviation industry to participate in a multistakeholder group to examine possible coexistence issues. *Id*. We note that issues related to wireless operations in the Lower C-band and co-existence with adjacent band radio altimeters continue to be handled in GN Docket No. 18-122. *See, e.g*., Petition for Partial Reconsideration of the 3.7–4.2 GHz Band Report and Order, GN Docket No. 18-122 (filed May 26, 2020).

[292] For example, these new analytical efforts included the Joint Interagency 5G Radar Altimeter Interference (JI-FRAI) Quick Reaction Test program which conducted bench tests, flight tests, and aircraft taxi testing to obtain objective data on the real world strength of 5G signals and their actual impact on radio altimeters in the 4.2–4.4 GHz band. *See* Frank H. Sanders, Kenneth R. Calahan, Geoffrey A. Sanders, and Savio Tran, "Measurements of 5G New Radio Spectral and Spatial Power Emissions for Radar Altimeter Interference Analysis," Technical Report TR-22-562, U.S. Department of Commerce, National Telecommunications and Information Administration, Institute for Telecommunication Sciences, October 2022; *see also, e.g.,* Airworthiness Directive; Transport and Commuter

(continued….)

the wireless industry in the Lower C-band[293] to adjust certain technical parameters in support of both full power deployments across the Lower C-band and the coexistence environment with adjacent band radio altimeters, for which retrofits were required by the FAA for part 121 and certain 129 aircraft in the United States as of February 1, 2024 to improve their signal rejection performance.[294] There are also ongoing aviation industry-led efforts to design next generation radio altimeters that predate the instant FCC proceeding but nonetheless may lead to the production and deployment of more resilient altimeters in the near future.[295] To that end, we expect the FAA to initiate and complete a rulemaking to codify the new radio altimeter standards in parallel with our rulemaking and prior to any auction we are required to commence under the OBBB Act. We believe that the development and installation of more robust radio altimeters will further aviation safety and aligns with other ongoing efforts to improve safety in the national airspace (NAS) including, for example, forthcoming air traffic control improvements recently appropriated for in the One Big Beautiful Bill Act.[296] Further, radio altimeter improvements will also reinforce the successful coexistence environment that exists between radio altimeters and operators in the 3.7 GHz Service, and we expect will obviate any need for ongoing mitigations or burdensome regulatory oversight going forward.

117. We seek comment on the current state of radio altimeter performance, and particularly specific technical data about the signal rejection capabilities of existing radio altimeters above 3.98 GHz that have been in use following the 2023 FAA-mandated retrofit. We ask radio altimeter equipment manufacturers and other relevant stakeholders to provide this data in sufficient detail to allow us to independently assess the ability of post-retrofit radio altimeters, with or without additional modifications such as filtering, to coexist with the planned new adjacent band wireless operations. We are concurrently issuing a protective order in this proceeding to enable requests for the confidential treatment of any data and related business sensitive information. Further, we welcome updates related to ongoing private sector efforts to improve radio altimeter performance. We seek input on the expected level of performance from new radio altimeters based on technical work currently underway, along with the timing for finalization of any new performance standard and its implementation by the aviation industry.

118. In light of the ongoing industry efforts to develop and produce improved radio altimeters, we also seek comment on the substance and timing of the transition process for implementing future radio altimeter upgrades throughout the NAS. Once any new technical requirements are adopted by FAA, what compliance steps would the aviation industry need to undertake, and how long would an altimeter retrofit process last?[297] What steps, if any, can be taken to enable a rapid implementation timeframe for any needed retrofits? Given our statutory mandate to complete a system of competitive bidding for the Upper

(Continued from previous page)
Category Airplanes, 86 Fed. Reg. 69984 (Dec. 9, 2021); Airworthiness Directives; Various Helicopters, 86 Fed. Reg. 69992 (Dec. 9, 2021).

[293] *See, e.g.*, Letter from Henry G. Hultquist, Vice President-Federal Regulatory, AT&T Services, Inc., et al., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed Mar. 31, 2023) (*Voluntary Commitments Ex Parte*) (detailing voluntary commitments jointly filed by AT&T Services, Inc., T-Mobile, UScellular, and Verizon, to which the remaining seventeen 3.7 GHz licensees also subsequently committed). The voluntary commitments sunset on January 1, 2028 unless extended or reduced by mutual agreement.

[294] *See, e.g.,* Federal Aviation Administration, Department of Transportation, Airworthiness Directives; Transport and Commuter Category Airplanes, 88 Fed. Reg. 34065 (May 26, 2023) (FAA Retrofit AD); *see also* FAA Order 8900.1, Vol 12, Ch 4, Section 4.3, Paragraphs C048, C059 and C060.

[295] *See, e.g.*, Honeywell Aerospace Technologies Comments at 3–4; Lockheed Martin Comments at 4; RTCA Comments at 1; RTX Corporation Comments at 1–4.

[296] OBBB Act, § 40003.

[297] *See, e.g.*, Air Line Pilots Association, International Comments at 5–10; Cargo Airline Association Comments at 1–2; Honeywell Aerospace Technologies Comments at 3–4; RTX Comments at 3–4.

C-band spectrum by July 2027,[298] and the need to provide bidders with assurances of when they will be able to access the spectrum won at auction, we also seek comment on how the timing of the aviation industry's future implementation efforts can be aligned with the fulfillment of our statutory responsibilities.

119. In this context, we note that the requirement in the OBBB Act to complete a system of competitive bidding for least 100 megahertz of the Upper C-band by July 4, 2027 does not mention adjacent band issues. We also recognize that our established *Emerging Technologies* framework has not previously been used to address adjacent band equities. Nevertheless, we recognize that radio altimeter retrofits by the aviation industry that significantly improve their signal rejection capabilities within an accelerated timeframe would not only promote coexistence with future terrestrial wireless operations in the Upper C-band over the long term, but also support a timely implementation of our legislative remit and a successful conclusion of the competitive bidding process. Therefore, given the unique circumstances and timing considerations involved with the Upper C-band, we seek comment on ways in which any future radio altimeter retrofits can be incentivized and accelerated as part of the overall Upper C-band repurposing and transition process.[299]

120. As an initial matter, and to provide financial certainty and transparency to all stakeholders, we seek comment on the estimated scale and scope of anticipated radio altimeter retrofits as a result of any new technical requirements that FAA may adopt in the near term that would facilitate a predictable and rapid repurposing of the Upper C-band. We also seek comment on specific proposals and mechanisms to facilitate these retrofits from a financial perspective, including how best to design and implement any such regime, as well as the basis for calculating such payments (e.g., number of altimeter retrofits, installation timing).[300] What would be an appropriate underlying rationale or predicate supporting such proposals, such as our *Emerging Technologies* framework? We also seek comment on who might be eligible to receive any such payments from winning bidders (e.g., airlines or other aircraft owners, equipment manufacturers)? Should eligibility be limited to certain types of aircraft or classes of operator? Are there certain such categories, such as foreign aircraft or aircraft operated for personal, private use, for which a right to receive payment would not serve the public interest? We also seek comment on who might be responsible for addressing any payments and how they could be allocated (e.g., the Upper C-band auction winners on a *pro rata* basis, akin to the mechanism used for the Lower C-band FSS transition)? Or would an alternate approach be more appropriate?

121. We further seek comment on how best to manage any potential payments related to radio altimeter retrofits. Specifically, could a list of eligible entities be created and maintained, such as with the incumbent earth station list used in the in-band FSS transition? What mechanism could be used to manage any such process and prevent potential fraud, waste, or abuse? If a third-party clearinghouse were used, could that be the same clearinghouse that we propose would oversee the in-band FSS transition cost reimbursement process? If not, what other type of entity might be appropriate to manage

[298] *See* OBBB Act, § 40002(b)(1).

[299] *See, e.g.*, *Redesignation of the 17.7–19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7–20.2 GHz and 27.5–30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3–17.8 GHz and 24.75–25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, IB Docket No. 98-172, Report and Order, 15 FCC Rcd 13430 (2002); *Amendment to the Commission's Rules Regarding a Plan for Sharing the Costs of Microwave Relocation*, WT Docket No. 95-157, First Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd. 8825 (1996); *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, 29 FCC Rcd 6567 (2014). We observe that, with few exceptions, the Commission is required by statute to deposit auction proceeds with the United States Treasury. 47 U.S.C. § 309(j)(8).

[300] We note that in 2023, FAA estimated the cost of interim radio altimeter retrofits (parts and labor) to be $80,000 per airplane for transport and commuter category aircraft, and $40,000 per aircraft for rotocraft. *See* FAA Retrofit AD, 88 Fed. Reg. at 34075.

payments relating to an aviation retrofit process, how would it be selected, what would its responsibilities include, and who would be responsible for its operational costs?

122. Finally, in recognition of the evolving spectral environment in the adjacent 4.2–4.4 GHz band, we seek comment on whether the proposed technical rules in the instant proceeding—including limits on maximum base station power and OOBE—would contribute to a successful coexistence environment between new wireless operations in the Upper C-band and current and upgraded radio altimeters. Some commenters have suggested that more stringent limits on power and OOBE than those that were adopted in the *2020 Report and Order* may be appropriate.[301] Accordingly, we seek comment on whether more restrictive limits on power or OOBE are necessary in the face of recent and future radio altimeter improvements to promote effective spectral coexistence. Does the answer depend on which of the two repurposing options the Commission ultimately selects for the Upper C-band? Should any changes to such technical parameters be limited to the block(s) immediately adjacent to the 4.2–4.4 GHz band or within certain geographic areas? What is the minimum size guard band that would be required between terrestrial wireless and altimeters and how might this answer change based on the power and OOBE limits of the adjacent spectrum block(s)? While we seek to avoid ongoing and potentially burdensome oversight that may inhibit the rapid and robust deployment of wireless services in the Upper C-band, we also seek comment on whether other emissions management techniques may help to promote effective coexistence with radio altimeter operations.[302]

IV. PROCEDURAL MATTERS

123. *Ex Parte Rules*. The proceeding this *NPRM* initiates shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[303] Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

124. *Regulatory Flexibility Act*. The Regulatory Flexibility Act of 1980, as amended (RFA),[304] requires that an agency prepare a regulatory flexibility analysis for notice-and-comment

[301] *See* Garmin International Comments at 6–8 (proposing an OOBE limit no greater than -30 dBm/MHz into the 4.2–4.4 GHz band and transmit power levels no greater than +65 dBm/MHz EIRP in the 3.98–4.2 GHz band); *see also* Honeywell Aerospace Technologies Comments at 4; Lockheed Martin Comments at 3–4.

[302] *See Voluntary Commitments Ex Parte*.

[303] 47 CFR §§ 1.1200 *et seq.*

[304] 5 U.S.C. §§ 601 *et seq*., as amended by the Small Business Regulatory Enforcement and Fairness Act (SBREFA), Pub. L. No. 104-121, 110 Stat. 847 (1996).

rulemaking proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.[305] Accordingly, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning potential rule and policy changes contained in this *Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix A. The Commission invites the general public, in particular small businesses, to comment on the IRFA. Comments must be filed by the deadlines for comments indicated on the first page of this *Notice of Proposed Rulemaking*, and must also have a separate and distinct heading designating them as responses to the IRFA.

125. *Paperwork Reduction Act*. This document may contain proposed new or modified information collections. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on any information collections contained in this document, as required by the Paperwork Reduction Act of 1995, 44 U.S.C. §§ 3501–3521. In addition, pursuant to the Small Business Paperwork Relief Act of 2022, 44 U.S.C. §§ 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

126. *Providing Accountability Through Transparency Act*. Consistent with the Providing Accountability Through Transparency Act, Public Law 118-9, a summary of this document will be available on https://www.fcc.gov/proposed-rulemakings.

127. *Filing of Comments and Reply Comments*. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS).

- *Electronic Filers*: Comments may be filed electronically using the Internet by accessing the ECFS: https://www.fcc.gov/ecfs.
- *Paper Filers*: Parties who choose to file by paper must file an original and one copy of each filing.
  - Filings can be sent by hand or messenger delivery, by commercial courier, or by the U.S. Postal Service. **All filings must be addressed to the Secretary, Federal Communications Commission.**
  - Hand-delivered or messenger-delivered paper filings for the Commission's Secretary are accepted between 8:00 a.m. and 4:00 p.m. by the FCC's mailing contractor at 9050 Junction Drive, Annapolis Junction, MD 20701. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
  - Commercial courier deliveries (any deliveries not by the U.S. Postal Service) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
  - Filings sent by U.S. Postal Service First-Class Mail, Priority Mail, and Priority Mail Express must be sent to 45 L Street NE, Washington, DC 20554.

128. *People with Disabilities*. To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530.

129. *Contact Person*. For further information about this proceeding, contact Paul Powell, FCC, Wireless Telecommunications Bureau, Mobility Division, Paul.Powell@fcc.gov.

[305] 5 U.S.C. § 605(b).

V. ORDERING CLAUSES

130. IT IS ORDERED, pursuant to sections 1, 2, 4(i), 301, 302(a), 303, 304, 307, 309, 316, and 403 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 301, 302(a), 303, 304, 307, 309, 316 and 403, and by section 40002 of the OBBB Act, that this *Notice of Proposed Rulemaking* IS HEREBY ADOPTED.[306]

131. IT IS FURTHER ORDERED that, pursuant to applicable procedures set forth in sections 1.415 and 1.419 of the Commission's Rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments on the *Notice of Proposed Rulemaking* on or before 30 days after publication in the Federal Register, and reply comments on or before 60 days after publication in the Federal Register.

132. IT IS FURTHER ORDERED that the Commission's Office of the Secretary SHALL SEND a copy of this *Notice of Proposed Rulemaking*, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for the Small Business Administration (SBA) Office of Advocacy.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

[306] Pursuant to Executive Order 12866, 58 Fed. Reg. 51735 (Oct. 4, 1993), as amended by Executive Order 14215, 90 Fed. Reg. 10447 (Feb. 24, 2025), this regulatory action has been determined to be significant under Executive Order 12866.

APPENDIX A

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Federal Communications Commission (Commission) has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the policies and rules proposed in the *Notice of Proposed Rulemaking* (*NPRM*) assessing the possible significant economic impact on a substantial number of small entities. The Commission requests written public comments on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments specified on the first page of the *NPRM*. The Commission will send a copy of the *NPRM*, including this IRFA, to the Chief Counsel for the Small Business Administration (SBA).[2] In addition, the *NPRM* and IRFA (or summaries thereof) will be published in the Federal Register.[3]

A. Need for, and Objectives of, the Proposed Rules

2. With today's *NPRM*, the Commission seeks comment on proposals to expand next generation wireless services in the 3.7–4.2 GHz band (C-band). As means of furthering its objective of optimizing use of the C-band's versatile coverage, capacity, and propagation characteristics, the Commission in 2020 repurposed the 3.7–3.98 GHz portion of the band (Lower C-band) for flexible use in the contiguous United States. As a result of that effort, Fixed Satellite Service (FSS) space and earth station operators deployed new and improved wireless services that brought 5G to countless communities, including rural, remote, and underserved areas. The *NPRM* takes another step to put vital mid-band spectrum to more intensive, flexible use that will support robust connectivity, spur economic growth, and advance American security interests, in furtherance of the One Big Beautiful Bill Act (OBBB Act).[4]

3. The *NPRM* proposes to further enable terrestrial wireless operations in a segment of the 3.98–4.2 GHz portion of the C-band (Upper C-band) in the contiguous United States and to generally apply the part 27 licensing and operating rules that presently govern wireless operations in the Lower C-band to new full-power commercial operations in the Upper C-band. In July 2025, as part of the OBBB Act, Congress reinstituted the Commission's general authority to grant licenses through systems of competitive bidding through September 2034 and established a path forward for the eventual repurposing of 800 megahertz to be licensed through competitive bidding, including at least 500 megahertz for full power commercial licensed use cases.[5] The OBBB Act also specifically directed the Commission to "grant licenses through systems of competitive bidding, before the expiration of the general auction authority for not less than 300 megahertz, including by completing a system of competitive bidding not later than 2 years after the date of enactment of this Act for not less than 100 megahertz in the band between 3.98 gigahertz and 4.2 gigahertz."[6]

4. Pursuant to this statutory directive, the *NPRM* seeks comment on options for reconfiguration of the Upper C-band. We have developed these options in light of what we believe might be achievable both in terms of further transitioning in-band incumbent FSS operations in the contiguous United States, as well as ongoing technical advancements with adjacent band radio altimeters which will further enhance their signal rejection capabilities and bolster the existing successful spectral co-existence

[1] 5 U.S.C. §§ 601 *et seq*., as amended by the Small Business Regulatory Enforcement and Fairness Act (SBREFA), Pub. L. No. 104-121, 110 Stat. 847 (1996).

[2] *Id.* § 603(a).

[3] *Id*.

[4] One Big Beautiful Bill Act, Pub. L. No. 119-21, § 40002, 139 Stat. 72 (2025) (OBBB Act).

[5] OBBB Act, § 40002(b)(1); *see also* 47 U.S.C. § 309(j)(11).

[6] OBBB Act, § 40002(b)(2).

environment. We propose to generally apply the existing 3.7 GHz Service rules to any newly authorized terrestrial wireless operations in any reconfiguration scenario. As discussed in further detail below, any other rules and requirements, including those relating to the transition process, would be modeled to the greatest extent possible on those that applied to the Lower C-band transition.

5. Thus, throughout the *NPRM*, we seek to enable more intensive flexible use of key mid-band spectrum by retaining many elements of the successful Lower C-band transition, and, where appropriate, by leveraging the lessons learned from that process to craft an improved process for transitioning the Upper C-band.

B. Legal Basis

6. The proposed action is authorized pursuant to sections 1, 2, 4(i), 301, 302(a), 303, 304, 307, 309, 316, and 403 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 301, 302(a), 303, 304, 307, 309, 316, and 403, and by section 40002 of the OBBB Act.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

7. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[7] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[8] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act (SBA).[9] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[10] The SBA establishes small business size standards that agencies are required to use when promulgating regulations relating to small businesses; agencies may establish alternative size standards for use in such programs, but must consult and obtain approval from SBA before doing so.[11]

8. Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe three broad groups of small entities that could be directly affected by our actions.[12] In general, a small business is an independent business having fewer than 500 employees.[13] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 34.75 million businesses.[14] Next, "small organizations" are not-for-profit enterprises that are independently owned and operated and not dominant their field.[15] While we do not have data regarding the number of

[7] 5 U.S.C. § 603(b)(3).

[8] *Id*. § 601(6).

[9] *Id*. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[10] 15 U.S.C. § 632.

[11] 13 CFR § 121.903.

[12] 5 U.S.C. § 601(3)–(6).

[13] *See* SBA, Office of Advocacy, *Frequently Asked Questions About Small Business* (July 23, 2024), https://advocacy.sba.gov/wp-content/uploads/2024/12/Frequently-Asked-Questions-About-Small-Business_2024-508.pdf.

[14] *Id*.

[15] 5 U.S.C. § 601(4).

non-profits that meet that criteria, over 99 percent of nonprofits have fewer than 500 employees.[16] Finally, "small governmental jurisdictions" are defined as cities, counties, towns, townships, villages, school districts, or special districts with populations of less than fifty thousand.[17] Based on the 2022 U.S. Census of Governments data, we estimate that at least 48,724 out of 90,835 local government jurisdictions have a population of less than 50,000.[18]

9. We have identified the Wireless Telecommunications Carriers (except Satellite) and Satellite Telecommunications industries as the most likely to be impacted by the rules proposed in the *NPRM*. These industries are identified in the chart below by their six-digit North American Industry Classification System (NAICS)[19] codes and corresponding SBA size standard.[20] Based on currently available U.S. Census data regarding the estimated number of small firms in each identified industry, we conclude that the proposed rules will impact a substantial number of small entities. Where available, we also provide additional information regarding the number of potentially affected entities in the industries identified below.

Regulated Industry (Footnotes specify potentially affected entities within a regulated industry where applicable)	**NAICS Code**	**SBA Size Standard**	**Total Firms**[21]	**Total Small Firms**[22]	**% Small Firms**
Wireless Telecommunications Carriers (except Satellite)[23]	517112	1,500 employees	1,184	1,081	91.30%
Satellite Telecommunications[24]	517410	$44 million	332	195	58.73%

[16] *See* SBA, Office of Advocacy, *Small Business Facts, Spotlight on Nonprofits* (July 2019), https://advocacy.sba.gov/2019/07/25/small-business-facts-spotlight-on-nonprofits/.

[17] 5 U.S.C. § 601(5).

[18] *See* U.S. Census Bureau, 2022 Census of Governments –Organization, https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html, tables 1–11.

[19] The North American Industry Classification System (NAICS) is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. *See* www.census.gov/NAICS for further details regarding the NAICS codes identified in this chart.

[20] The size standards in this chart are set forth in 13 CFR 121.201, by six digit NAICS code.

[21] *U.S. Census Bureau*, "*Selected Sectors: Employment Size of Firms for the U.S.: 2022*." Economic Census, ECN Core Statistics Economic Census: Establishment and Firm Size Statistics for the U.S., EC2200SIZEEMPFIRM, 2025, "*Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2022*." Economic Census, ECN Core Statistics Economic Census: Establishment and Firm Size Statistics for the U.S.

[22] *Id.*

[23] Affected Entities in this industry include Wireless Broadband Internet Access Service Providers, Wireless Carriers and Service Providers, Wireless Communications Services, and Wireless Telephony.

[24] Affected Entities in this industry include Fixed Satellite Small Transmit/Receive Earth Stations and Mobile Satellite Earth Stations.

2024 Universal Service Monitoring Report Telecommunications Service Provider Data[25] (Data as of December 2023)	SBA Size Standard (1500 Employees)		
Affected Entity	**Total # FCC Form 499A Filers[26]**	**Small Firms**	**% Small Entities**
Wireless Telecommunications Carriers (except Satellite)[27]	585	498	85.13

D. Description of Economic Impact and Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

10. The RFA directs agencies to describe the economic impact of proposed rules on small entities, as well as projected reporting, recordkeeping and other compliance requirements, including an estimate of the classes of small entities which will be subject to the requirements and the type of professional skills necessary for preparation of the report or record.[28]

11. The proposed changes in the *NPRM*, if adopted, may require small entities to hire attorneys, engineers, consultants, or other professionals to comply. Although the Commission cannot quantify the cost of compliance, we note that several of the proposed rule changes are consistent with and mirror existing policies and requirements used for other part 27 flexible-use licenses. Therefore, small entities with existing licenses in other bands may already be familiar with such policies and requirements and have the processes and procedures in place to facilitate compliance resulting in minimal incremental costs to comply with our requirements for the Upper C-band. Below is an overview of areas discussed in the *NPRM* that contain proposals that may, if adopted, lead to modified or additional compliance requirements for small entities.

12. *Reconfiguration and Allocation of the Upper C-band*. The *NPRM* seek comment on options for reconfiguring the Upper C-band in the contiguous United States ranging from a minimum of 100 megahertz (3.98–4.08 GHz) for terrestrial wireless use, as required by the OBBB Act, to a maximum of 180 megahertz (3.98–4.16 GHz). Under any approach that may be adopted within this range, the *NPRM* proposes that any remainder of the Upper C-band would be used for repacked FSS operations with a guard band of no more than 20 megahertz. The Commission seeks comment on these reconfiguration options generally, and further seeks input specifically as to how each of the topics addressed throughout the *NPRM* might be impacted depending on which reconfiguration approach we elect.

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[25] Federal-State Joint Board on Universal Service, Universal Service Monitoring Report at 26, Table 1.12 (2024), https://docs.fcc.gov/public/attachments/DOC-408848A1.pdf.

[26] The Communications Act of 1934 (Act), as amended, requires that the Commission establish mechanisms to fund universal service, interstate telecommunications relay services, the administration of the North American Numbering Plan, and the shared costs of local number portability administration. 47 U.S.C. §§ 151, 225, 251, 254. To accomplish these congressionally-directed objectives, the Commission requires telecommunications carriers and certain other providers of telecommunications (including Voice-over-Internet-Protocol (VoIP) service providers) to report each year on the FCC Form 499-A the revenues they receive from offering service. *See* 47 CFR §§ 52.17(b), 52.32(b), 54.708, 54.711, 64.604(b)(5)(iii)(B). The FCC Form 499-A is due on April 1 of each year. See Universal Service Administrative Company Schedule of Filings, https://www.usac.org/service-providers/contributing-to-the-usf/when-to-file/ (last visited Oct. 28, 2025).

[27] Affected Entities in this industry include all reporting wireless carriers and service providers.

[28] 5 U.S.C. § 603(b)(4).

13. Additionally, the *NPRM* proposes to add a primary, non-federal mobile, except aeronautical mobile, allocation to whatever portion of the 4.0–4.2 GHz band we reconfigure in the contiguous United States. This proposal would harmonize the allocations in the Upper C-band with those in 3.7–4.0 GHz and thus make a wider band of contiguous mid-band spectrum available for next generation wireless services. The *NPRM* further proposes to retain exclusive non-federal allocations for FSS and Fixed Service (FS) in whatever portion of that band is *not* repurposed for terrestrial commercial wireless use in the contiguous United States, recognizing that FS operations have been sunset in those areas, and to preserve the status quo regarding FSS and FS allocations and operations outside of the contiguous United States. We seek comment on the benefits and potential drawbacks of our reconfiguration and reallocation proposals, including their economic impacts, potential alternatives, and whether they strike the right balance between incumbent interests and our goal of enabling more intensive flexible use of the C-band.

14. *Competitive Bidding Procedures*. The *NPRM* proposes to conduct an auction of licenses in the Upper C-band in conformity with the general competitive bidding rules set forth in part 1, subpart Q, of the Commission's rules.[29] As we have in all recent previous Commission spectrum auctions, we propose to employ the part 1 rules governing competitive bidding design, designated entity preferences, unjust enrichment, application and certification procedures, payment procedures, reporting requirements, and the prohibition on certain communications between auction applicants. Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its part 1 general competitive bidding rules in the future. Further, the *NPRM* seeks comment on whether any of those rules would be inappropriate or should be modified for an auction of licenses in the Upper C-band.

15. The *NPRM* also proposes to adopt bidding credits for the two larger designated entity business sizes provided in the Commission's part 1 standardized schedule of bidding credits, as we have done in all auctions of licenses likely to be used to provide 5G services in a variety of bands since the part 1 schedule of bidding credits was updated in 2015.[30] Further, the *NPRM* proposes to offer rural service providers a designated entity bidding credit for Upper C-band licenses. We seek comment on these proposals, and on whether the characteristics of the Upper C-band and our proposed licensing model suggest that we should adopt different small business size standards and associated bidding credits than we have in the past.

16. *The Transition of FSS Operations*. The *NPRM* proposes to adopt many of the same transition framework elements used for Lower C-band for the Upper C-band transition of incumbent FSS operations. First, the *NPRM* proposes that "incumbent space station operators" will generally include all space station operators authorized to provide C-band service to any part of the contiguous United States pursuant to an FCC-issued license or grant of market access as of June 21, 2018. The *NPRM* also proposes to define an "eligible space station operator" as an incumbent space station operator that has demonstrated as of February 1, 2020, that it has an existing relationship to provide service via C-band satellite transmission to one or more incumbent earth stations in the contiguous United States. In addition, the *NPRM* proposes to define "incumbent earth stations" for the Upper C-band transition to include fixed and temporary fixed earth stations that were operational as of April 19, 2018, and that: (1) continue to be operational; (2) were licensed or registered in the ICFS database on November 7, 2018; and (3) timely certified the accuracy of the information on file with the Commission by May 28, 2019. We seek comment on these proposals to apply the same baseline definitions as in the Lower C-band transition.

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[29] *See* 47 CFR §§ 1.2101–1.2114.

[30] 47 CFR § 1.2110(f)(2)(i)(A)–(C) (defining small business entities using average gross revenues thresholds of $4 million, $20 million, and $55 million); *see also* 47 CFR § 27.1301(a), (c)(1) (600 MHz Service); *id*. § 27.1601(a) (3.45 GHz Service); *id*. § 27.1402(a) (3.7 GHz Service); *id*. § 27.1219(a)–(b) (Educational Broadband Service); *id*. § 30.302(a)–(b) (Upper Microwave Flexible Use Service); *id*. § 96.30(a), (c)(1) (Citizens Broadband Radio Service).

17. The *NPRM* also proposes to use our authority under section 316 of the Communications Act to modify, as needed, the existing licenses, market access authorizations, and registrations currently held by FSS C-band incumbents to clear whatever portion of the Upper C-band we ultimately reallocate. The *NPRM's* proposals aim to align with the clearing approach that the Commission took in carrying out the Lower C-band transition. We seek comment on this proposal.

18. Regarding the transition schedule, the *NPRM* proposes to set a specific transition deadline to ensure that all incumbent FSS operations are cleared in a timely manner to facilitate the introduction of terrestrial wireless services in the Upper C-band, and to provide potential auction bidders with some certainty as to when they will be able to obtain access to Upper C-band spectrum. As a result, the *NPRM* seeks comment on whether a transition timeline of approximately five and one half years, as was done with the Lower C-band, would be appropriate here and, if not, whether one or more different deadline(s) should be used. We seek comment on this proposal, including how deadlines should shift depending upon which reconfiguration proposal we adopt.

19. As with the Lower C-band transition, the *NPRM* proposes to require new terrestrial wireless licensees in the Upper C-band to reimburse the reasonable transition costs incurred by eligible FSS space station and incumbent earth station operators and to allocate the responsibility for those costs among the new terrestrial wireless licensees on a *pro rata* basis. We again propose to offer incumbent earth station operators the choice of either accepting reimbursement for their actual reasonable transition costs or accepting a lump sum reimbursement for all of their incumbent earth stations based on the average, estimated cost of transitioning those facilities. We seek comment on these proposals, whether improvements can be made in light of lessons learned in the prior transition, and whether the expected amount of transition cost reimbursement for FSS services in the Upper C-band will vary depending upon the reconfiguration option that we ultimately adopt.

20. Consistent with the Lower C-band approach, the *NPRM* also proposes to require all actual transition costs needed to clear existing Upper C-band operations in the contiguous United States to be "reasonable" in order to qualify for reimbursement and would not permit reimbursement for equipment upgrades beyond what is necessary to clear the band. The *NPRM* proposes not to reimburse incumbents for the speculative value of any business opportunities they claim they would lose as a result of the transition. The *NPRM* also proposes that any soft costs (e.g., transactional expenses directly attributable to relocation) would again be subject to a rebuttable presumption for a cap of 2% of the hard costs involved in the transition. We seek comment on these proposals.

21. To allocate the transition financial responsibilities of new 3.7 GHz Service licensees, the *NPRM* again proposes to generally base the share for each licensee on that licensee's *pro rata* share of gross winning bids in the underlying auction, with specific allocation formulas governing each type of payment obligation. We seek comment on this proposal, and commenters are invited to recommend alternative approaches with a detailed description of the methodology behind their proposals.

22. The *NPRM* also seeks comment on whether we should consider incentives—monetary or otherwise—to facilitate expeditious clearing of the Upper C-band. We ask commenters to address who should be eligible for such incentives, how any responsibility thereto should be allocated, and what benchmarks they should be aligned with, as well as how incentives should be calculated and whether they would be impacted by adoption of either of the band reconfiguration options we are considering.

23. The *NPRM* proposes to once again use an independent Clearinghouse to oversee the cost-related aspects of the Upper C-band transition, using a similar selection process and imposing the same broad responsibilities as in the Lower C-band transition. We seek comment on this proposal, and on ways to build upon the success of the Lower C-band Clearinghouse by way of potential improvements to any new transition cost reimbursement program. Additionally, we seek comment on whether we should again use a Cost Catalog to establish ranges of presumptively reasonable transition costs, including whether we should retain the existing Cost Catalog, adjust it in some way (such as for inflation), or develop an entirely new one for the Upper C-band transition. The *NPRM* proposes to establish a search committee that will use selection criteria based upon the Clearinghouse's duties, rather than asking the committee to

establish those criteria itself. We also seek comment on the proposal to adopt for the Upper C-band transition a process broadly similar to that used to select the Clearinghouse for the Lower C-band transition, with some proposed modifications.

24. In order to relocate incumbent FSS operations out of the reconfigured portion of the Upper C-band, the *NPRM* proposes to adopt requirements similar to those that governed the transition of FSS operations out of the Lower C-band. These requirements would include that eligible space station operators prepare and submit their own Transition Plans by a set deadline, and also submit quarterly status reports on their efforts. We seek comment on this proposal, on whether we should again establish a Relocation Coordinator to oversee the FSS transition, and if so, how we should select it and with what responsibilities we should task it.

25. *Band Plan*. As with the Lower C-band, the *NPRM* proposes to license at least 100 megahertz of the Upper C-band in 20 megahertz blocks, using an unpaired spectrum block configuration, and on an exclusive, Partial Economic Area (PEA) basis. We seek comment on whether this approach remains appropriate for the wireless technologies likely to be deployed in the Upper C-band, whether PEAs are the appropriate areas, and whether 20 megahertz remains the appropriate block size, or if we should consider smaller or larger block sizes. We also invite comment on the costs and benefits of geographic licensing, and of any alternatives that commenters propose. Although the *NPRM* does not propose licensing areas outside of the contiguous United States, we seek comment on whether we should adopt a licensing approach for certain such areas.

26. *Licensing and Operating Rules*. The *NPRM* proposes to adopt similar licensing and operating rules that provide flexibility to align new licenses in the Upper C-band with existing licenses in the Lower C-band, which are already governed by part 27. In particular, we propose that new licensees in the Upper C-band comply with licensing and operating rules that are applicable to all part 27 services, including those rules relating to the assignment of licenses by competitive bidding,[31] flexible use,[32] regulatory status,[33] foreign ownership reporting,[34] compliance with construction requirements,[35] renewal criteria,[36] permanent discontinuance of operations,[37] partitioning and disaggregation,[38] and spectrum leasing.[39] The *NPRM* asks commenters to identify any aspects of our general part 27 service rules that should be modified to accommodate the particular characteristics of the Upper C-band. Similarly, the *NPRM* seeks comment as to whether we should adopt service-specific rules for the Upper C-band in certain other areas, or if we should integrate the band into the rules that already apply to the Lower C-band. These rules govern eligibility,[40] license term,[41] performance requirements,[42] renewal term construction obligations,[43] and other licensing and operating rules. We also seek comment on a 15-year

[31] 47 U.S.C. § 309(j); 47 CFR §§ 1.2101–1.2114.

[32] 47 U.S.C. § 303(y); *see also* 47 CFR §§ 1.2106, 27.2, 27.3.

[33] 47 CFR § 27.10.

[34] 47 U.S.C. § 310; 47 CFR § 27.12.

[35] 47 CFR § 27.14(k)

[36] 47 CFR § 1.949.

[37] 47 CFR § 1.953.

[38] 47 CFR § 1.950.

[39] 47 CFR §§ 1.9001 *et seq*.

[40] 47 CFR § 27.12

[41] 47 CFR. § 27.13.

[42] 47 CFR § 27.14.

[43] 47 CFR § 1.949.

term for licenses in the Upper C-band. We ask commenters to discuss the costs and benefits associated with these approaches, as well as with any proposed alternatives.

27. In addition, the *NPRM* proposes to adopt an open eligibility standard for Upper C-band licenses. This approach would not affect citizenship, character, or other generally applicable qualifications that apply under our rules, and it would be consistent with that taken in the Lower C-band. We seek comment on the costs and benefits of this standard, including its effects on competition, innovation, and investment.

28. Regarding mobile spectrum holding policies, the *NPRM* proposes to not adopt a pre-auction bright-line limit on the ability of any entity to acquire spectrum in the Upper C-band through competitive bidding at auction. Instead, we propose to review holdings on a case-by-case basis when applications for initial licenses are filed post-auction to ensure that the public interest benefits of having a threshold on spectrum applicable to secondary market transactions are not rendered ineffective. Finally, we propose to include the Upper C-band spectrum in the Commission's spectrum screen, which assists the Commission with identifying markets that may warrant further competitive analysis, as a means of evaluating proposed secondary market transactions.

29. *Performance Requirements*. The *NPRM* proposes to require Upper C-band licensees offering mobile or point-to-multipoint services to provide reliable signal coverage and offer service to at least 45% of the population in each of their license areas within eight years of the license issue date (first performance benchmark), and to at least 80% of the population in each of their license areas within 12 years from the license issue date (second performance benchmark). We propose to once again permit Internet of Things (IoT) providers to instead demonstrate that they offer geographic area coverage of 35% of the license area at the first (eight-year) performance benchmark, and geographic area coverage of 65% of the license area at the second (12-year) performance benchmark. The *NPRM* also seeks comment on proposed requirements for licensees relying on fixed, point-to-point links that would mirror those adopted for the Lower C-band. Specifically, licensees relying on point-to-point links licensees would be required to demonstrate within eight years of the license issue date (first performance benchmark) that they have four links operating and providing service, either to customers or for internal use, if the population within the license area is equal to or less than 268,000. If the population within the license area is greater than 268,000, we propose to require licensees to demonstrate they have at least one link in operation and providing service, either to customers or for internal use, per every 67,000 persons within a license area. Licensees relying on point-to-point service would be required to demonstrate within 12 years of the license issue date (final performance benchmark) that they have eight links operating and providing service, either to customers or for internal use, if the population within the license area is equal to or less than 268,000. If the population within the license area is greater than 268,000, we would require a demonstration that the licensee is providing service and has at least two links in operation per every 67,000 persons within a license area. We seek comments on all of these proposals.

30. *Regarding* penalties for failure to meet performance requirements, we propose to adopt a rule requiring that, in the event a licensee fails to meet the first performance benchmark, the licensee's second benchmark and license term would be reduced by two years, thereby requiring it to meet the second performance benchmark two years sooner (at 10 years into the license term) and correspondingly reducing its license term to 13 years. As with our approach in the Lower C-band, we further propose that, in the event a licensee fails to meet the second performance benchmark for a particular license area, its authorization for each license area in which it fails to meet the performance requirement shall terminate automatically without Commission action. In the event a licensee's authority to operate terminates automatically, we propose to make the relevant license available for reassignment pursuant to the competitive bidding provisions of section 309(j). Consistent with the Commission's rules applicable to the Lower C-band and other bands, we propose that any Upper C-band licensee that forfeits its license for failing to meet its performance requirements would be precluded from regaining the license. We invite comments on these proposals.

31. *Compliance Procedures*. In addition to the compliance procedures applicable to all part 27 licensees, including the filing of electronic coverage maps and supporting documentation, the *NPRM* proposes to require that the coverage maps accurately depict both the boundaries of each licensed area and the coverage boundaries of the areas to which the licensee actually provides service. Therefore, if a licensee does not provide reliable signal coverage to its entire license area, we propose that its map must accurately depict the boundaries of the area or areas within each license area not being served. Further, we propose that each licensee also must file supporting documentation certifying the type of service it is providing for each licensed area within its service territory and the type of technology used to provide such service. We seek comment on our proposals, as well as whether small entities face any special or unique issues with respect to the transition that would require additional time for them to comply.

32. *License Renewal and Renewal Term Construction Obligations.* We propose to apply the general renewal requirements applicable to all Wireless Radio Services (WRS) licensees to licensees in the Upper C-band.[44] We further propose to apply our general part 27 renewal requirements for wireless licenses to the Upper C-band, as the Commission has for the Lower C-band, the 3.45 GHz band, and the 3.55–3.7 GHz band. Correspondingly, we propose to include the Upper C-band in the unified renewal framework for WRS. This means that Upper C-band licensees will be required to comply with section 1.949 of our rules by demonstrating that, over the course of their license term, they either: (1) provided and continue to provide service to the public, or (2) operated and continue to operate the license to meet the licensee's private, internal communications needs.[45] Licensees can demonstrate compliance with this requirement either through the renewal showing in section (f) of that rule, or through the relevant safe harbor found in section (e).[46]

33. In addition to, and independent of, the general renewal provisions set forth in our rules, we seek comment on applying specific renewal term construction obligations to Upper C-band licensees. We invite comment on whether there are unique characteristics of the Upper C-band that might warrant a different approach than the general renewal requirements. Commenters are encouraged to address the costs and benefits of their proposed rules and discuss how a given proposal will encourage investment and deployment in areas that might not otherwise benefit from significant wireless coverage.

34. *Technical Rules*. Consistent with existing rules for similar wireless services in nearby bands, the *NPRM* proposes to permit base stations in non-rural areas to operate at power levels up to 1640 watts per megahertz EIRP and base stations in rural areas to operate with double the non-rural power limits (3280 watts per megahertz EIRP). The *NPRM* also proposes to apply section 27.50(j)(1)–(2) of the Commission's rules to both fixed and base stations operating in the Upper C-band.[47] For mobiles and portables, the *NPRM* proposes to adopt a 1 Watt (30 dBm) EIRP power limit, matching the standards adopted for the Lower C-band and the 3.45 GHz band. We invite comment on alternative power limits, request technical details in support of any proffered alternatives, and request analyses of the costs and benefits of such proposals.

35. *For* base station out-of-band emissions (OOBE), the *NPRM* proposes—consistent with the Lower C-band limit—to require base stations to suppress their emissions beyond the edge of their authorization to a conducted power level of -13 dBm/MHz, and to apply the existing part 27 measurement procedures and resolution bandwidth that are used for the Lower C-band. We seek comment on whether the same or different limits should be applied to emissions within the Upper C-band compared to those at the band's edge. For mobile units, the *NPRM* proposes to require that they suppress their conducted emissions to no more than -13 dBm/MHz outside their authorized frequency band, i.e., at the authorized

[44] *See* 47 CFR § 1.949 (Application for renewal of authorization).

[45] 47 CFR § 1.949.

[46] 47 CFR § 1.949(e), (f).

[47] 47 CFR § 27.50(j)(1)–(2) (Lower C-band power limits).

channel edge as measured at the antenna terminals. This proposal is consistent with the mobile OOBE limit that governs the Lower C-band, as is our proposal to adopt a relaxation of the emission limit within the first five megahertz of the channel edge by varying the resolution bandwidth used when measuring the emission. For emissions within 1 megahertz from the channel edge, the minimum resolution bandwidth would be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kilohertz. In the bands between one and five megahertz removed from the licensee's authorized frequency block, the minimum resolution bandwidth would be 500 kilohertz. Finally, the *NPRM* proposes to apply sections 27.53(h)(4) and 27.53(i) of the Commission's rules to Upper C-band, as was done for the Lower C-band.

36. Consistent with the existing part 27 AWS rules, Lower C-band, and 3.45 GHz band requirements, none of which impose antenna height limits on antenna structures, the *NPRM* proposes not to restrict antenna heights for Upper C-band operations beyond any requirements necessary to ensure air navigation safety. And as with the Lower C-band, the *NPRM* proposes to apply a -76 dBm/m^2/MHz power flux density (PFD) limit at a height of 1.5 meters above ground at the geographical border of Upper C-band licensees' service areas. We seek comment on the costs and benefits of these proposals, and on any potential alternatives.

37. The *NPRM* proposes to apply section 27.57(c) of the Commission's rules to terrestrial licensees in the Upper C-band; this rule requires all part 27 operations to comply with international agreements for operations near the Mexican and Canadian borders.[48] Also consistent with our Lower C-band approach, we propose to adopt several additional technical rules that apply to all part 27 services, including sections 27.51 (Equipment authorization), 27.52 (RF safety), 27.54 (Frequency stability), and part 1, subpart BB of the Commission's rules (Disturbance of AM Broadcast Station Antenna Patterns) for new terrestrial commercial wireless operations in the Upper C-band.

38. To safeguard incumbent FSS earth stations, the *NPRM* also proposes to adopt a PFD limit of -124 dBW/m^2/MHz as measured at the registered incumbent earth station antenna; this PFD limit is consistent with the Lower C-band and would apply to all emissions within the earth station's authorized band of operation, from both base and mobile stations. In order to protect earth stations from receiver blocking, we propose to require a PFD limit of -16 dBW/m^2/MHz, as measured at the registered incumbent earth station antenna, and applied across the transitioned frequency range. This blocking limit would apply to all emissions within the new terrestrial wireless licensee's authorized frequency range, and it is the same limit that applied to the Lower C-band transition. Finally, the *NPRM* proposes to allow full band/full arc use by FSS earth stations that continue to operate in the band during and after the transition process. We seek comment on these proposals, including the ongoing applicability of the assumptions that guided the Lower C-band transition, along with any appropriate alternatives.

39. In order to protect Telemetry, Tracking, and Command (TT&C) operations, the *NPRM* proposes to require new terrestrial licensees to ensure that the aggregated power from their operations meet an interference to noise ratio (I/N) of -6 dB as received by the TT&C earth station, and that they coordinate their co-channel operations within 70 km of TT&C earth stations that continue to operate in the Upper C-band. We also propose protections against adjacent channel interference, including: (1) aggregated power from adjacent 3.7 GHz Service operations must meet a -6 dB I/N ratio, and the limit would apply to all emissions removed from the TT&C's center frequency by more than 150% of the TT&C's necessary emission bandwidth; (2) we would not require prior coordination between adjacent operations, but 3.7 GHz Service licensees and TT&C earth station operators would be expected to cooperate in good faith and make reasonable efforts to anticipate and resolve technical problems that may inhibit effective and efficient use of the spectrum; and (3) TT&C operators would be expected to make available pertinent technical information about their systems upon request by the 3.7 GHz Service

[48] 47 CFR § 27.57(c).

licensees, and licensees of stations suffering or causing harmful interference would be expected to cooperate and resolve the problem by mutually satisfactory arrangements.

E. Discussion of Significant Alternatives Considered That Minimize the Significant Economic Impact on Small Entities

40. The RFA directs agencies to provide a description of any significant alternatives to the proposed rules that would accomplish the stated objectives of applicable statutes, and minimize any significant economic impact on small entities.[49] The discussion is required to include alternatives such as: "(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities."[50]

41. In formulating its request for comments*,* the Commission considered alternatives addressing the economic impact of its proposals on small entities, should they be adopted. In the *NPRM*, the Commission broadly proposes to reconfigure the Upper C-band for more intensive, next-generation wireless use by generally deploying the procedures used in—and the lessons learned from—the successful similar transition of the Lower C-band. Throughout that proceeding, the Commission contemplated how its adopted rules would uniquely affect small entities and calibrated its determinations accordingly. The approach taken towards considering the effect of our rules towards small entities in that proceeding largely informs our process in this one. For example, we consider the potential economic hardship or compliance burdens to small entities with respect to the information collection, such as whether they would require certain accommodations or additional time to comply. We seek comment from small entities as to whether these entities face any special or unique concerns regarding this issue. Similarly, in developing its proposals, the Commission considers the effect of modifications that could be made to our rules regarding administrative processes that would reduce the economic impacts of proposed rule changes on small entities. By seeking comment specifically targeting effects on small entities, the Commission will obtain the data required to consider the approach that will be most cost-effective and minimize the economic impact on small entities while also fulfilling the Commission's statutory mandate.

42. Specifically, the *NPRM* proposes to adopt 15-year license terms for new licenses in the Upper C-band. If adopted, small entities should once again benefit from the opportunity for long-term operational certainty and a longer period to develop innovative services. The *NPRM* also contemplates and seeks comment on potential issues that small entities might face in meeting the proposed performance requirements for new Upper C-band licensees. To that end, the *NPRM* inquires whether our proposed point-to-multipoint coverage and service benchmarks might necessitate that we grant small entities certain accommodations or additional time to comply. Similarly, the *NPRM* considers the impact of, and seeks comment on, whether small entities should be offered additional time to fulfill proposed compliance procedures. Finally, the proposed competitive bidding procedures would implement familiar designated entity preferences in an auction of Upper C-band licenses. The *NPRM* proposes to adopt bidding credits for small and very small businesses, and to adopt a rural service provider credit.

43. The Commission finds an overriding public interest in encouraging investment in wireless networks, facilitating access to scarce spectrum resources, and promoting the rapid development of mobile services to Americans. All licensees, including small entities, play a crucial role in achieving these goals. Therefore, the *NPRM* seeks comment on alternative obligations, timing for implementation, and other measures that could accommodate the needs and resources of small entities. The Commission

[49] 5 U.S.C. § 603(c).

[50] *Id.* § 603(c)(1)–(4).

will carefully consider the effects of its proposals on small entities before adopting final rules in this proceeding.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

44. None. This proposed rule is not duplicative, nor does it overlap or conflict, with any other federal rules.