September 9, 2026

FCC FACT SHEET[*]

Satellite Spectrum Abundance; Spectrum Abundance for Weird Space Stuff; Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use; Shared Use of the 42-42.5 GHz Band; Use of Spectrum Bands Above 24 GHz For Mobile Radio Services

Report and Order and Order of Proposed Modification and Further Notices of Proposed Rulemaking – SB Docket Nos. 25-180 and 26-54, GN Docket Nos. 14-77 and 22-352, WT Docket No. 23-158

Background:

Spectrum abundance fuels innovation and investment in the American space economy. It creates additional capacity for in-home satellite broadband for video, gaming, and AI, improves how traffic is routed on the ground, provides better connectivity to ships and planes, and opens the door to a wide range of industrial and commercial innovations in space. Accordingly, in this Report and Order and Order of Proposed Modification (Order) and Further Notices of Proposed Rulemaking (FNPRMs), the Federal Communications Commission (Commission) would take a series of actions that, together, could bring many thousands of megahertz of spectrum into the marketplace for new and growing uses of space-based communications. In particular, the Order would unlock more than 1,000 megahertz of spectrum in the 12.7-13.25 GHz (12.7 GHz) and 42-42.5 (42 GHz) bands for space services.

What the Order Would Do:

- In the 12.7 GHz band:
    - Permit fixed-satellite service (FSS) operations in both uplink and downlink
    - Allow FSS uplinks from individually licensed gateway and feeder link earth stations to space stations in geostationary satellite orbit (GSO) and non-geostationary orbit (NGSO)
    - Allow uplinks from earth stations in motion (ESIMs) aboard aircraft and maritime vessels to GSO space stations and downlink transmissions from NGSO space stations to blanket licensed user terminals, including ESIMs
- In the 42 GHz band:
    - Permit FSS downlink to individually licensed satellite gateway and feeder link earth stations
    - Maintain the existing primary allocation for terrestrial fixed service stations and change the allocation for terrestrial mobile service stations to secondary

What the FNPRMs Would Seek Comment On:

- Adding new allocations for satellite communications, including for the inter-satellite service, controlling spacecraft, and providing data communications in support of emergent space activities

[*] 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 SB Docket Nos. 25-180 and 26-54, GN Docket Nos. 14-77 and 22-352, and WT Docket No. 23-158, 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 § 1.200 *et seq*.

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

In the Matter of	)	
	)	
Satellite Spectrum Abundance	)	SB Docket No. 25-180
	)	
Spectrum Abundance for Weird Space Stuff	)	SB Docket No. 26-54
	)	
Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use	)	GN Docket No. 22-352 (Terminated)
	)	
Shared Use of the 42-42.5 GHz Band	)	WT Docket No. 23-158 (Terminated)
	)	
Use of Spectrum Bands Above 24 GHz for Mobile Radio Services	)	GN Docket No. 14-177

REPORT AND ORDER AND ORDER OF PROPOSED MODIFICATION AND FURTHER NOTICE OF PROPOSED RULEMAKING AND FURTHER 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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* This document has been circulated for tentative consideration by the Commission at its September 30, 2026 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 Chairman 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 CFR §§ 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. Spectrum abundance fuels innovation and investment in the American space economy. Bountiful downlink spectrum for consumer terminals makes in-home satellite broadband a more compelling and competitive option for video, gaming, and AI. More spectrum for fixed earth stations improves how traffic is routed on the ground and helps satellite networks operate more seamlessly. Additional capacity for inter-satellite links strengthens the backbone in orbit and makes it more resilient. Bolstering spectrum access for earth stations in motion (ESIMs) brings better connectivity to ships and planes. And new spectrum for telemetry, tracking, and control (TT&C) opens the door to a wide range of industrial and commercial innovations in space that we are only beginning to imagine. In today's omnibus decision, we take a series of actions that, together, could bring many thousands of megahertz of spectrum into the marketplace for new and untapped uses.

2. First, in today's *Spectrum Abundance R&O*, we unlock more than 1,000 megahertz of spectrum in the 12.7-13.25 GHz (12.7 GHz) and 42-42.5 GHz (42 GHz) bands. Our decision will bring more capacity for satellite broadband to the home, for in-flight and on-ship connectivity, and for core traffic-routing functions in satellite ground networks.[1]

[1] This *Spectrum Abundance R&O* results from the rulemaking proceedings that were launched in May 2025 to examine ways to use four frequency ranges more intensively by satellite communications: the 12.7 GHz band; the 42 GHz band; the 51.4-52.4 GHz band; and the "W-band" frequencies at 92.0-94.0 GHz, 94.1-100 GHz, 102.0-109.5 GHz, and 111.8-114.25 GHz. *Satellite Spectrum Abundance, Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use, Shared Use of the 42-42.5 GHz Band, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services,* SB Docket No. 25-180, GN Docket No, 22-352, WT Docket No. 23-158, GN Docket No. 14-177, Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, 40 FCC Rcd 3794 (2025) (*Spectrum Abundance NPRM*); *see also Expanding Flexible Use of the 12.2-12.7 GHz Band; Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use*, WT Docket No. 20-443, GN Docket (continued….)

3. In the 12.7 GHz band, we adopt an aggressive, bi-directional frequency-use plan. We permit fixed-satellite service (FSS) operations in both uplink and downlink, depending on their most efficient and valuable use. We allow FSS uplinks from individually licensed gateway and feeder link earth stations to space stations in geostationary satellite orbit (GSO)[2] and non-geostationary orbit (NGSO), as well as uplinks from ESIMs aboard aircraft and maritime vessels to GSO space stations.[3] In the downlink, we allow transmissions from NGSO space stations to blanket licensed user terminals, including ESIMs.[4] We amend, or eliminate altogether, footnotes to the U.S. Table of Allocations (U.S. Table) that currently limit the use of the 12.7 GHz band by satellite communications, while also maintaining, protecting, and sunsetting incumbent terrestrial operations in the band for ten years.

4. In the 42 GHz band, we add a primary allocation to the U.S. Table for FSS downlinks to individually licensed satellite gateway and feeder link earth stations, while maintaining the existing primary allocation for terrestrial fixed service (FS) stations and changing the allocation for terrestrial mobile service (MS) stations from primary to secondary status for non-Federal operations. We find that a "light licensing" approach[5] is appropriate to allow intensive use of the 42 GHz band by satellite communications, but we defer consideration of the specific implementation of such licensing to other Commission proceedings addressing light-licensing of satellite communications.

5. But we do not stop there. In the accompanying *Spectrum Abundance FNPRM*, we explore freeing up 1,450 megahertz of spectrum in the Ku- and Ka- bands, along with 138.25 *gigahertz* in the D-band, for more intensive satellite communications. We seek comment on adding new allocations for satellite communications to the U.S. Table, along with eliminating barriers that prevent even greater use of spectrum resources in the United States. We also seek comment on adopting new allocations and technical rules for the inter-satellite service across several bands.

6. We do not stop there either. In the *WSS FNPRM*, the final part of today's omnibus, we add to the list of spectrum bands under consideration for "weird space stuff." Just a few months ago, the Commission opened a first-of-its-kind proceeding to bring spectrum abundance for missions like in-orbit servicing, refueling, manufacturing, or operations on or around the Moon—that is, next-generation space

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No. 22-352, Report and Order and Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking and Order, 38 FCC Rcd 5283 (2023) (*12.7 GHz Band NPRM*); *Shared Use of the 42-42.5 GHz Band; Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, WT Docket No. 23-158, GN Docket No. 14-177, Notice of Proposed Rulemaking, 38 FCC Rcd 6362 (2023) (*42 GHz Band NPRM*). This *Spectrum Abundance R&O* takes action only on the 12.7 GHz and 42 GHz bands. The proposals for the 51.4-52.4 GHz band and W-band are not addressed at this time.

[2] *See* 47 CFR § 25.103.

[3] We implement these changes through amendments to the U.S. Table of Frequency Allocations (U.S. Table) and our satellite licensing rules. The Commission recently adopted a new part 100 to replace the part 25 rules that were in place when the *Spectrum Abundance NPRM* was adopted. *Space Modernization for the 21st Century*, SB Docket No. 25-306, Report and Order and Further Notice of Proposed Rulemaking, FCC 26-47 (rel. Jul. 23, 2026) (*Space Modernization Report and Order and FNPRM*). Although those rules changes are not yet effective, we adopt changes to our rules governing space communications by amending part 100 rule sections, rather than amending part 25 rules that will be removed once part 100 is effective.

[4] ESIMs are earth stations operating in motion aboard aircraft, vessels, or vehicles. 47 CFR § 25.103.

[5] "Light licensing" refers to the framework adopted for the fixed service in the 70/80/90 GHz band, in which a licensee receives a non-exclusive nationwide license and then registers site deployments through a database managed by a third-party, which includes coordination with Federal operations using a "green light/yellow light" system. *See Spectrum Abundance NPRM*, 40 FCC Rcd at 3818, para. 63, citing *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 39 FCC Rcd 886 (2024).

missions that do not provide connectivity to the public.[6] Now, in the *WSS FNPRM*, we seek comment on three new bands spanning thousands of megahertz that might be able to be used to control spacecraft or to provide data communications in support of such emergent space operations.

7. The actions we take today are part of the Commission's leadership in efficient spectrum management to provide the spectrum resources that American free enterprise can use to build a vibrant commercial space economy. We look forward to seeing how spectrum abundance will expand high-speed connectivity to underserved areas and unlocking the next generation of space-based communications.

II. REPORT AND ORDER (SPECTRUM ABUNDANCE R&O)

A. Background

8. The Commission has explored various ways to promote more efficient use of the 12.7 GHz[7] and 42 GHz[8] bands in recent years, through separate rulemakings in 2023 as well as in the 2025 *Spectrum Abundance NRPM*. The *12.7 GHz Band NPRM* proposed to repurpose some or all of the 12.7 GHz band for mobile terrestrial broadband or other expanded use but also sought comment on alternatives to promote shared use of the band.[9] The *42 GHz NPRM* similarly examined use of the 42 GHz band for expanded terrestrial services through FS and MS flexible use but further invited comment on alternative approaches.[10]

9. In May 2025, the Commission released the *Spectrum Abundance NRPM* to seek comment on increasing the use of the 12.7 GHz and 42 GHz bands by satellite communications, either as an alternative or complement to terrestrial wireless communications.[11] The Commission asked whether increasing access by satellite systems might better encourage a more efficient and intensive use of the 12.7 GHz and 42 GHz bands on a more expedited basis than proposals to increase access to these bands by terrestrial wireless services.[12]

10. The Commission sought comment on a range of ways that the 12.7 GHz band could be used more intensively for satellite communications. First, it sought comment on eliminating existing

[6] *Spectrum Abundance for Weird Space Stuff*, SB Docket No. 26-54, Notice of Proposed Rulemaking, FCC 26-13 (Mar. 27, 2026) (*WSS NPRM*).

[7] The 12.7 GHz band is allocated to the FSS (Earth-to-space), fixed service (FS), and mobile service (MS) on a primary basis for non-Federal use. The full in-band and adjacent-band allocations and footnotes are summarized in the *Spectrum Abundance NRPM* and discussed as relevant below. *See Spectrum Abundance NRPM*, 40 FCC Rcd at 3796-98, paras. 5-9.

[8] The 42 GHz band is allocated on a primary basis to non-Federal FS and MS. *See Spectrum Abundance NRPM*, 40 FCC Rcd at 3799-3800, paras. 14-15.

[9] *12.7 GHz Band NPRM*, 38 FCC Rcd at 5285, para. 3. Prior to this NPRM, the Commission had issued a Notice of Inquiry on uses of the 12.7 GHz band. *Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use*, GN Docket No. 22-352, Notice of Inquiry and Order, 37 FCC Rcd 13427 (2022) (*12.7 GHz NOI*). The NOI was accompanied by a temporary freeze on terrestrial and space and earth station applications in the 12.7 GHz band. *Id.*, citing *180-Day Freeze on Applications for New or Modified Authorizations for the 12.7-13.25 GHz Band*, Public Notice, DA 22-974 (IB, PSHSB, MB, and WTB Sept. 19, 2022) (*Freeze Public Notice*).

[10] *Shared Use of the 42-42.5 GHz Band; Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Notice of Proposed Rulemaking, 38 FCC Rcd 6362 (2023) (*42 GHz Band NPRM*). 55 pleadings were filed in response to the *12.7 GHz Band NPRM*, and 21 pleadings were filed in response to the *42 GHz Band NPRM*. A list of pleadings for both proceedings is provided in Appendix A. The notices were published in the Federal Register. 88 Fed. Reg. 49423 (July 31, 2023) (*42 GHz Band NPRM*); 88 Fed. Reg. 43938 (July 10, 2023) (*12.7 GHz Band NPRM*).

[11] *Spectrum Abundance NPRM*, 40 FCC Rcd at 3800, para. 17.

[12] *Id*. at 3795, 3800, paras. 2, 17.

regulatory restrictions on the use of the band by satellite systems.[13] Second, it sought comment on whether to expand the use of the band to ESIMs.[14] Third, it queried whether the 12.7 GHz band could be used for FSS downlinks in addition to, or as an alternative to, the existing allocation for FSS uplinks.[15] Fourth, it sought comment on whether to lift the temporary freeze on space and earth station applications in the 12.7 GHz band.[16]

11. The Commission also sought comment on whether granting access to the 42 GHz band by satellite systems might better ensure that the spectrum is used more efficiently and intensively.[17] It sought comment on adding an allocation to the FSS (space-to-Earth) in the 42 GHz band on either a primary or secondary basis,[18] and asked whether to limit any earth station deployments to individually licensed gateway stations.[19]

12. For both the 12.7 GHz and 42 GHz bands, the Commission sought comment on whether expanded use of the bands by satellite services would necessitate any changes to the spectrum sharing obligations between satellite and terrestrial operations.[20] In particular, the Commission asked whether to maintain the existing primary allocations for FS and MS in the 12.7 GHz and 42 GHz bands or whether these allocations should be changed to secondary allocations.[21] In the 12.7 GHz band, the Commission sought comment on whether increasing use of the band by satellite communications would require a sunsetting of non-Federal terrestrial operations.[22] Furthermore, the Commission requested comment on whether any changes to our satellite licensing rules would be needed to accommodate increased use of the 12.7 GHz and 42 GHz bands by satellite services, including whether the self-coordinated and data-assisted "light licensing" framework for the 70/80/90 GHz band could be utilized for the 42 GHz band.[23]

B. Discussion

13. Upon review of the record, we conclude that opening the 12.7 GHz and 42 GHz bands for new and more intensive satellite use, with due consideration of compatibility with other uses of the spectrum, will provide the greatest benefit to American consumers among the options considered in the

[13] *Id.* at 3801-02, paras. 21-23.

[14] *Id.* at 3802-05, paras. 23-28.

[15] *Id.* at 3805, para. 29-30.

[16] *Id.* at 3805-07, paras. 31-33.

[17] *Spectrum Abundance NPRM*, 40 FCC Rcd at 3811-12, paras. 46, 47.

[18] *Id.* at 3812-13, para. 48.

[19] *Id.*

[20] *Id.* at 3807, 3813, paras. 34, 50.

[21] *Id*. at 3807, paras. 34

[22] *Id*. at para. 35.

[23] *Spectrum Abundance NPRM*, 40 FCC Rcd at 3806, 3813, paras. 32, 52. The *Spectrum Abundance NPRM* was published in the Federal Register. 90 Fed. Reg. 27499 (June 27, 2025). In response, the Commission received 24 comments, 12 reply comments, and 7 *ex parte* presentations. A list of commenters and entities making *ex parte* presentations is contained in Appendix A. A number of parties filed comments asserting concerns about the potential negative health impact of increased electromagnetic radiation as a result of making spectrum available for satellite communications. *See* EHT Dec. 2, 2025, *Ex Parte* Letter, Wired Broadband Comments, and Wired Broadband Reply Comments (arguing generally that Commission-regulated equipment is subject to our rules limiting human exposure to radio frequency (RF) emissions from such equipment); *see also* 47 CFR §§ 1.1307(b), 1.1310. The Commission's rules limiting human exposure to RF emissions are outside of the scope of this proceeding.

notices and responsive comments,[24] by quickly enabling greater satellite broadband capacity in all parts of the United States, seamless mobile connectivity on aircraft and ships, and more robust gateway operations supporting user traffic. Indeed, comments in response to the *Spectrum Abundance NPRM* widely support increased use of both the 12.7 GHz and 42 GHz bands for satellite communications.[25] Commenters note that the 12.7 GHz and 42 GHz bands are adjacent to spectrum already used for FSS,[26] that creating contiguous blocks of spectrum would facilitate the provision of high-speed, broadband satellite services,[27] and that satellite operators are positioned to immediately put the 12.7 GHz and 42 GHz bands into use to provide service to consumers.[28] More broadly, commenters point to the explosive recent growth in satellite communications, particularly via NGSO space stations,[29] and argue that satellite use of these bands would enable ubiquitous broadband services across the entire United States and represents their highest and most productive use.[30]

14. Further, no commenter in response to the *Spectrum Abundance NPRM* opposes the addition of satellite allocations in the 12.7 GHz or 42 GHz bands.[31] While earlier comments on the *12.7 GHz Band NPRM* and *42 GHz Band NPRM* were supportive of making additional spectrum available for terrestrial wireless communications in the 12.7 GHz[32] and 42 GHz bands,[33] arguing that more spectrum was needed for wireless broadband,[34] commenters also stressed that bands below 12.7 GHz were of equal,

[24] *See infra* Appx. G, Regulatory Impact Analysis.

[25] *See, e.g.*, CCIA Comments at 1-2; CSF Reply Comments at 1-2; Digital Liberty Comments at 2, 4; OTI/PK Comments at 7.

[26] *See* Amazon Kuiper Comments at 2; CSF Reply Comments at 2; OTI/PK Comments at 4; SES et al. Comments at 2.

[27] *See* Amazon Kuiper Reply Comments at 2; CSF Reply Comments at 2; Logos Comments at 3, 6-7; SpaceX Comments at 3-4; SpaceX Reply Comments at 3.

[28] *See* Amazon Kuiper Comments at 5; Amazon Kuiper Reply Comments at 1; Logos Comments at 6-7; SES et al. Comments at 2, 9; SIA Comments at 3. Commenters also argue that the 42 GHz band is in high demand for use to provide next-generation satellite services. *See* CCIA Comments at 3; Amazon Kuiper Comments at 2-4; AST Comments at 3; SES et al. Comments at 11; SIA Comments at 8; SpaceX Comments at 5.

[29] *See* OTI/PK Comments at 7 ("[G]lobal satellite capacity increased eight-fold over just three recent years . . . in 2023 and is forecast to increase another tenfold by 2028.").

[30] *See* Logos Comments at 3, 5; SES et al. Comments at 1; SES et al. Reply Comments at 1; SIA Comments at 10; SpaceX Comments at 1-2.

[31] *See* Amazon Kuiper Reply Comments at 3. Although CTIA advocates setting aside the 12.7 GHz band as a "relocation band" for systems that may be displaced from the 1.3-10.5 GHz bands as a result of spectrum reallocations in other proceedings, CTIA Comments at 2, 5, it supports adopting allocations for FSS in the 12.7-13.25 GHz band in a manner that ensures continued use by existing licensed terrestrial operators and would not preclude future use of the band for terrestrial fixed wireless operations. CTIA Comments at 5-6; CTIA Reply Comments at 2. Other terrestrial wireless advocates propose to maintain use of the 12.7 GHz and 42 GHz bands for terrestrial fixed service, but not for mobile flexible use. *See* Association for Broadband Without Boundaries Reply Comments at 1; Micronet Reply Comments at 2; WISPA Comments at 1-2, 3. CTIA supports the provision of terrestrial wireless services in the 42 GHz band, but does not propose any particular uses and focuses its comments on the need for any new satellite allocations in the 42 GHz band to protect the existing licensing framework for Upper Microwave Flexible Use Service (UMFUS) in adjacent bands, rather than on any expanded terrestrial use of the 12.7 GHz or 42 GHz band. CTIA Comments at 11-12; CTIA Reply Comments at 3, 6-7.

[32] *See, e.g.,* Go Long Wireless, LLC Comments at 1 (Aug. 9, 2023); Qualcomm, Inc. Comments at 5 (Aug. 9, 2023); Samsung Comments at 4 (Aug. 9, 2023); T-Mobile USA, Inc. Comments at 3 (Aug. 9, 2023).

[33] *See, e.g.*, Charter Commun., Inc. Comments at 1 (Aug. 30, 2023); Qualcomm, Inc. Comments at 4 (Aug. 30, 2023); T-Mobile USA, Inc. Comments at 2, 6 (Aug. 30, 2023).

[34] *See, e.g.,* T-Mobile Comments at 4 (Aug. 30, 2023); Verizon Comments at 2-3.

or greater, importance to terrestrial wireless providers.[35] Since then, the Commission has made new spectrum available for enhanced terrestrial wireless deployment in bands more favorable to their use, including the Upper C-band.[36] In contrast, the current record does not reflect significant interest in more intensive use of the 12.7 GHz or 42 GHz bands for terrestrial wireless services.[37] Rather, commenters supporting continued terrestrial fixed operations in the 12.7 GHz and 42 GHz bands reflect that these operations can coexist with increased usage of the bands by satellite communications.[38] Accordingly, as supported by the record and detailed below, we make the 12.7 GHz and 42 GHz bands available for new and more intensive satellite services while offering continuing protection of incumbent terrestrial licensees, subject to a 10-year sunset in the 12.7 GHz band.[39]

1. 12.7 GHz Band

15. The 12.7 GHz band represents a rare opportunity for diverse and intensive use by satellite services. Allocated and used for FSS uplinks, but adjacent to two gigahertz of spectrum used for NGSO FSS downlinks, the band offers greater utility to GSO networks for uplink transmissions and NGSO systems for downlink reception. We adapt our frequency-use plan to maximize these benefits. Within the existing uplink FSS allocation, we allow both individually licensed gateways and feeder links communicating with GSO and NGSO satellites as well as blanket-licensed ESIMs on aircraft and ships communicating with GSO satellites. In addition, we adopt a new, primary downlink FSS (space-to-Earth) allocation for NGSO systems and enable blanket licensing of user terminals and ESIMs on land, sea, and air. To ensure compatibility under our intensive bi-directional spectrum-use plan, we require NGSO FSS downlinks to accept any interference from FSS uplinks, and require all FSS users to continue to protect incumbent terrestrial licensees for a period of ten years until such protections sunset, while changing the overall FS and MS allocations from primary to secondary. In sum, we aggressively unlock 525 megahertz of spectrum for new uses including high-speed consumer satellite broadband, in-demand flight

[35] *See, e.g.,* 5G Americas Comments at 4 (Aug. 9, 2023) (stating a preference that bands with propagation characteristics similar to C-band in the mid-band range be prioritized for licensed full-power, wide-area mobile broadband); Ericsson Comments at 12-13 (stating that access to the 3-8 GHz range remains critical to achieving coverage to serve 5G/6G applications); Verizon Comments at 4 (stating that it is imperative that the Commission focus efforts on making available mid-band spectrum that can support near term needs for wide-area nationwide deployments, such as the 3.1-2.45 GHz, 4.4-4.94 GHz, and 7.125-8.4 GHz bands). Satellite operators also argued in the earlier proceedings for access to the 12.7 GHz and 42 GHz bands in order to provide satellite communications. *See, e.g.,* Kuiper Systems LLC (Amazon) Comments at 2 (Aug. 30, 2023); Satellite Operators Joint Comments at 4 (Aug. 9, 2023).

[36] *See, e.g, Upper C-band (3.98-4.2 GHz), Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket Nos. 25-59 and 18-122, Report and Order, Order of Proposed Modification, and Order on Reconsideration, FCC 26-46 (rel. Jul. 24, 2026); *Auction of Advanced Wireless Services (AWS-3) Licenses, Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 113, Bidding Scheduled to Begin June 2, 2026*, AU 3Docket No. 25-117, Public Notice, 40 FCC Rcd 10099 (OEA/WTB 2025).

[37] In addition, commenters note that some terrestrial mobile operators have returned, or have not put to use, millimeter wave spectrum that was previously awarded by competitive biddings for terrestrial use in other bands. *See, e.g.,* Amazon Kuiper Reply Comments at 3; OTI/PK Comments at 5; SES et al. Comments at 11-12; SIA Comments at 4, 8-9.

[38] Micronet Reply Comments at 2 (stating that the 12.7 GHz band represents an opportunity to preserve use for high-capacity FS links while continuing to accommodate satellite uses); WISPA Comments at 4-5 (stating that terrestrial FS can coexist with increased use of the 12.7 GHz band by satellite communications, in either the Earth-to-space or space-to-Earth directions).

[39] Consequently, and as supported and unopposed on the record, *see* SpaceX Reply Comments at 4-5, we terminate the separate proceedings examining the 12.7 GHz band (GN Docket No. 22-352) and the 42 GHz band (WT Docket No. 23-158). We do not terminate the proceeding in GN Docket No. 14-177 that examines broader issues regarding the use of spectrum bands for mobile radio services above 24 GHz in addition to the 12.7 GHz and 42 GHz bands.

connectivity, and core gateway functions, to the ultimate benefit of the American public.[40]

a. NGSO Downlinks

16. NGSO constellations play a large and rapidly expanding role in broadband satellite connectivity.[41] In the adjacent 10.7-12.7 GHz band, NGSO FSS systems already downlink to consumer terminals.[42] We find that adding 525 megahertz of additional, contiguous downlink spectrum—a more than 25% increase–has the potential to accelerate broadband deployment in rural and remote areas of the United States in a manner that is faster, more affordable, and more scalable than existing alternatives.[43] Further, we find this bi-directional operation is technically feasible by limiting potentially interfering ground-based uplinks to individually licensed gateway and feeder-link sites, among other technical measures detailed below.[44]

17. Opening the 12.7 GHz band to NGSO FSS downlink operation is a forward-looking decision taken at a time of unprecedented NGSO system deployment. While the 12.7-12.75 GHz band is already allocated for downlink FSS in ITU Regions 1 and 3—which will facilitate operations outside the United States—the majority of the 12.7 GHz band is limited to uplinks in the FSS allocations internationally.[45] Rather than viewing the current international allocations as an impediment, as some commenters do,[46] we form an independent decision with the best interests of the American public in mind.[47] The Commission has taken a leadership stance in advancing the regulatory landscape for modern NGSO constellations.[48] Here, we conclude that the benefits to the U.S. public from the fostering of high-speed connectivity that will result from opening a large block of contiguous Ku-band downlink spectrum for use by ubiquitous user terminals, particularly in areas of the United States that are currently unserved

[40] In addition, we conclude that the record does not provide sufficient evidence to support the technical viability of CTIA's proposal to reserve the 12.7 GHz band for services that could be relocated from other bands in the 1.3-10.5 GHz bands as a result of recent legislation. CTIA Comments at 2-3. In this respect, some comments express doubt as to whether all services could be relocated into the 12.7 GHz band and retain their current operations. WISPA Comments at 6. Furthermore, reserving the 12.7 GHz band as a relocation band would inhibit the more intensive use of the band for satellite communications and leave valuable spectrum resources underused for a long period of time in order to keep the spectrum available for relocation needs that may, or may not, realize as CTIA anticipates. *See* SES et al. Reply Comments at 7.

[41] *See generally, e.g.*, OTI/PK Comments at 7.

[42] *See* SpaceX Comments at 3.

[43] *See* CSF Reply Comments at 2; SpaceX Comments at 3-4. A downlink allocation is supported on the record as fostering more intensive satellite use of the band. *See, e.g.,* Amazon Kuiper Comments at 2, n.5; CSF Reply Comments at 2-3; DIRECTV Comments at 3; SpaceX Comments at 2-5.

[44] The record in this proceeding reflects an interest by GSO FSS operators in the 12.7 GHz band solely for uplink FSS operations. *See generally* SES et al. Comments; SES et al. Reply Comments. Limiting the downlink FSS allocation to NGSO space stations also avoids the need to consider potential restrictions on NGSO operations to protect GSO downlinks.

[45] 47 CFR at § 2.106(a); *see also* SIA Comments at 5.

[46] *See* SES et al. Comments at 7-8.

[47] Thus, although NGSO FSS downlink operations in the United States will not be able to benefit immediately from protection through international coordination procedures, due to the lack of international downlink allocations in Region 2, *see* SES et al. Comments at 8, we note that the Commission's licensing and market access rules will afford primary status to these operations that must be respected by all satellite operations serving the United States.

[48] *See, e.g.*, *Modernizing Spectrum Sharing for Satellite Broadband,* SB Docket No. 25-157, Report and Order, FCC 26-26 (rel. May 1, 2026).

or underserved, outweighs the desire for international harmonization.[49]

18. *Blanket Licensing and ESIMs*. We find that our goal to provide additional spectrum resources for satellite communications can be furthered by allowing blanket-licensed user terminals, including ESIMs, to receive communications from NGSO satellites in the 12.7 GHz band. User terminals and ESIMs are already authorized to receive downlinks from NGSO satellites in the adjacent 11.7-12.7 GHz band.[50] We find that user terminals and ESIMs can also do so in the 12.7 GHz band, in light of the similar propagation characteristics of the band, the PFD limits we are extending for the protection of terrestrial stations, the condition we impose that NGSO FSS receiving terminals be operated on an unprotected basis vis-à-vis uplink earth stations and grandfathered terrestrial stations.[51]

19. *PFD Limit*. In order to protect terrestrial operations from new NGSO FSS downlinks in the 12.7 GHz band, we extend the PFD limits that apply in the 10.7-11.7 GHz band to the 12.7 GHz band.[52] Because of the similar transmission characteristics and terrestrial operations in these nearby bands, we find that applying these established PFD limits to the 12.7 GHz band will provide adequate protection to grandfathered terrestrial stations and will also be readily achievable by NGSO FSS systems already implementing these limits in the 10.7-11.7 GHz band when communicating with subscriber terminals.[53]

20. *Footnotes NG53 and NG57*. To facilitate more intensive use of the 12.75-13.25 GHz band by satellite communications, we also amend existing footnote NG53[54] and delete existing footnote NG57,[55] which limit the use of the band for satellite communications to favor terrestrial use and are

[49] We also agree with comments that making the 12.7 GHz band available for NGSO FSS downlinks may encourage the availability of the band internationally as well, and that the public interest would not be served by delaying the introduction of such connectivity for U.S. consumers in the meantime. SpaceX Reply Comments at 3; Digital Liberty Comments at 3. To implement this new FSS downlink allocation, we add a new footnote, NG144, to the non-Federal Table and also amend the definition of the "extended Ku-band" in section 100.3 of our rules to include the 12.7-13.25 GHz frequency band and space-to-Earth direction. *See infra* Appx. B, Final Rules.

[50] *See* footnotes NG527A, 47 CFR § 2.106(d)(527)(iii) and 5.487A, 47 CFR § 2.106(b)(487)(i).

[51] Commenters support expanding use of the 12.7 GHz band to ESIMs. *See* SpaceX Comments at 2; CSF Comments at 2; OTI/PK Comments at 5-6. Although we afford primary status to both FSS (Earth-to-space) and FSS (space-to-Earth) in the United States in the 12.7 GHz band, we require earth stations operating with NGSO space stations under the FSS (space-to-Earth) allocation, including ESIMs, to accept any harmful interference when in geographic proximity to GSO FSS (Earth-to-space) transmitting earth stations. For ESIMs, we include the 12.7-13.25 GHz band (space-to-Earth) in our amendment to footnote NG527A to authorize ESIMs receiving communications from NGSO FSS satellites, subject to the existing provision of footnote NG527A that NGSO systems may not cause harmful interference to, or claim protection from harmful interference from, GSO networks. 47 CFR § 2.106(d)(527). We do not anticipate harmful interference from NGSO system downlinks to uplinks in the 12.7 GHz band because the NGSO satellite is transmitting towards the Earth, while the potential victim uplink station is the satellite receiver.

[52] *See* SpaceX Comments at 4. No commenter opposes applying these PFD limits.

[53] *See* 47 CFR § 2.106(a).

[54] Footnote NG53 reserves sub-bands of the 12.75-13.25 GHz band for television pick up (TVPU) and CARS inside a 50 km radius of the top 100 television markets and prohibits NGSO FSS gateway stations from operating in these locations in these sub-bands. 47 CFR § 2.106(d)(53)(i)-(iv). Outside these areas, NGSO FSS gateway stations operate on a co-primary basis with terrestrial operations in these sub-bands. The provisions of NG53 do not apply to GSO FSS operations in the band. 47 CFR § 2.106(d)(53) at note 13. We amend footnote NG53 by deleting and reserving sub-paragraphs (i), (ii), and (iv) to remove the restrictions on NGSO FSS operations in the 12.75-13.25 GHz band. *See infra* Appx. B, Final Rules.

[55] Footnote NG57 limits the use of the 12.75-13.25 GHz band by NGSO FSS systems to communications with individually licensed earth stations, such as gateway earth stations, without specifying a direction of transmission

(continued….)

inconsistent with the frequency-use plan we adopt here. Nonetheless, as discussed below, NGSO FSS operations must protect or accept interference from grandfathered FS and MS operations in the band until the sunset of the protection for incumbent FS and MS by the date of publication of this Report and Order in the Federal Register plus 10 years.

b. Individually Licensed Uplinks

21. There are existing FSS uplink operations authorized in the 12.7 GHz band in the United States, including operations under the procedures for "planned bands" pursuant to Appendix 30B of the ITU Radio Regulations.[56] We find there is a public interest in preserving and expanding these operations in order to continue service to customers and to maintain protections afforded to U.S. operations under Appendix 30B. We can do so compatibly under our intensive, bi-directional frequency-use plan by limiting deployments to individually licensed gateway and feeder-link earth stations and by lifting the temporary filing freeze in the 12.75-13.25 GHz band but maintaining the freeze in the 12.7-12.75 GHz band to protect adjacent-band operations.[57]

22. The uplink FSS allocation in the 12.7 GHz band is not available for blanket licensing,[58] and GSO uplinks are further limited to international systems (i.e., uplinks from the United States that are forwarded in the downlink direction to other countries) in order to limit the number of earth stations to facilitate the growth of BAS, CARS, and fixed microwave operations.[59] Given that we are designating this band for more intensive satellite use, and limiting protected terrestrial stations to existing incumbents, below, this restriction is unnecessary and would be unduly constraining on the FSS. Accordingly, we remove this restriction, which is contained in footnote NG52 to the U.S. Table.[60]

23. At the same time, to enable the successful, blanket-licensed NGSO downlink operation we found would serve the public interest above, we limit uplinks from the ground in the 12.7 GHz band to individually licensed gateway and feeder-link earth stations communicating with GSO and NGSO space stations.[61] Individually licensed earth station operations in the 12.7 GHz band will be subject to the

(Continued from previous page)
(Earth-to-space or space-to-Earth). 47 CFR § 2.106(d)(57). We delete footnote NG57 in its entirety. *See infra* Appx. B, Final Rules.

[56] *See Spectrum Abundance FNPRM and NPRM*, 40 FCC Rcd at 3806, para. 32 n.69 (citing ITU Radio Regulations, Appendix 30B, *Provisions and associated Plan for the fixed-satellite service in the frequency bands 4500-4800 MHz, 6725-7025 MHz, 10.70-10.95 GHz, 11.20-11.45 GHz, and 12.75-13.25 GHz*).

[57] A temporary freeze on new space station and earth station applications was instituted in the 12.7 GHz band to preserve the landscape of authorized operations pending the Commission's consideration of actions in this proceeding. *12.7 GHz Band NPRM,* 38 FCC Rcd at 5321, para. 67. Now that action has been taken, the freeze on new applications in the 12.75-13.25 GHz band is no longer necessary and maintaining it would frustrate the goal of making the 12.75-13.25 GHz band more accessible for satellite communications. Lifting this freeze is also broadly supported by comments. *See, e.g.,* Ovzon Mar. 27, 2026, *Ex Parte* Letter at 1; SIA Comments at 4; SES et al. Comments at 5. Accordingly, in light of our decision to make the 12.75-13.25 GHz band available for more intensive use by satellite communications, we lift the temporary freeze on new space and earth station license applications and new requests for U.S. market access that seek to operate in the 12.75-13.25 GHz band, effective upon publication of this Report and Order in the Federal Register. The order lifting the freeze in the 12.75-13.25 GHz band is procedural in nature and, therefore, is not subject to the effective-date requirement of the Administrative Procedure Act. *See* 5 U.S.C. § 553(d). As discussed below, we replace the temporary freeze on the filing of new space and earth station applications in the 12.7-12.75 GHz band with a permanent freeze to protect adjacent-band downlink receivers of satellite television and NGSO FSS.

[58] *See* 47 CFR § 2.106(d)(57); *see also, e.g.*, 47 CFR § 25.115(c)(1).

[59] *Spectrum Abundance NPRM*, 40 FCC Rcd at 3801-02, para. 21.

[60] Specifically, we amend footnote NG52 to remove the band 12.75-13.25 GHz (Earth-to-space) from the limitation to international systems. *See infra* Appx. B, Final Rules.

[61] *See infra* Appx. B, Final Rules (adding new footnote NG144).

Commission's existing earth station licensing rules.[62] Limiting ground uplinks to gateways and feeder links will reduce the number of geographic areas where blanket-licensed NGSO FSS downlinks could experience harmful interference.[63] In contrast, ubiquitous deployment of transmitting earth stations on the ground could cause widespread harmful interference to NGSO FSS downlinks in the 12.7 GHz band and severely constrain its bi-directional utility.[64]

24. *Permanent Application Freeze in 12.7-12.75 GHz for FSS (Earth-to-space)*. The 12.7-12.75 GHz band lies directly adjacent to the 12.2-12.7 GHz band which is used by satellite television customers as well as FSS downlink operations. Concerns were raised in the record that increased use of this band by FSS uplinks could cause harmful interference to these adjacent-band receivers.[65] We find that freezing current space and earth station assignments for FSS (Earth-to-space) both supports and protects existing uplink capacity for incumbent space and earth stations and also permits the 12.7-12.75 GHz band to continue to serve as a buffer between existing and future FSS (Earth-to-space) operations in the 12.75-13.25 GHz band and satellite television and FSS downlink operations in the 12.2-12.7 GHz band.[66]

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[62] These rules include, but are not limited to, restrictions on power and out-of-band emissions for transmitting earth stations contained in section 25.204 of the Commission's rules, 47 CFR § 25.204, minimum antenna elevation angle requirements of section 25.205, 47 CFR § 25.205, the earth station antenna performance standards of section 25.209, 47 CFR § 25.209, and the off-axis EIRP density envelopes of section 25.218. 47 CFR § 25.218. In order to ensure that existing rules apply to increased use of the 12.7 GHz band by satellite uplinks, we amend the definition of the "extended Ku-band" in section 100.3 of our rules to include this frequency band and direction. 47 CFR § 100.3. We also note that existing section 25.205 of our rules requires that earth station antennas must not transmit at elevation angles less than five degrees in a frequency band with an allocation to space services operating in both the Earth-to-space and space-to-Earth directions. 47 CFR § 25.205(a). Paragraph (b) of section 25.205, 47 CFR § 25.205(b), prohibits earth stations aboard aircraft from transmitting at elevation angles of less than three degrees on the ground, but this paragraph is not applicable because we limit ESIM transmissions from aircraft in the 12.75-13.25 GHz band to aircraft operating at altitude.

[63] Some commenters prefer to restrict use of the 12.7 GHz band to FSS uplinks and oppose opening it to FSS downlinks, particularly to ubiquitous blanket-licensed receiving earth stations. *See generally* SES et al. Comments; SES et al. Reply Comments. To the extent that ubiquitous deployments are contemplated in the 12.7 GHz band, they assert that such deployments should be provided for uplink FSS operations, not downlink. *See* SES et al. Comments at 8 (citing decisions by European regulators and the ITU to allow ubiquitous ESIM uplinks in the 12.75-13.25 GHz band); *Id.* at 4 (supporting uplinks from blanket-licensed, fixed very small aperture terminals (VSATs)); SES et al. Reply Comments at 3. We need not choose between extremes. Instead, as described below, we authorize ubiquitous uplinks from aeronautical and maritime ESIMs to GSO satellites as well as ubiquitous downlinks from NGSO satellites to user terminals on the ground and ESIMs. This accommodates both uses and recognizes the explosive recent and anticipated future growth of NGSO capacity serving the United States, without the preclusive effects that uplink VSAT deployment could have.

[64] We note that it also mitigates the potential for interference from FSS uplinks to satellite television downlinks in the adjacent 12.2-12.7 GHz band by eliminating the risk of ubiquitously deployed transmitting earth stations in proximity to consumer terminals receiving satellite television signals. *See* DIRECTV Comments at 3-4 (stating that technical analyses need to be undertaken before blanket-licensed FSS uplink transmissions are allowed in the 12.7 GHz band).

[65] DIRECTV, whose customers receive its satellite television service using the primary allocation for Broadcasting-Satellite Service (BSS) in the 12.2-12.7 GHz band, supports more rigorous use of the 12.7 GHz band by satellite services, but notes that appropriate technical analyses and mitigation measures must be taken before authorizing new uplink use cases in the band, particularly if blanket-licensed. DIRECTV Comments at 2.

[66] We effectuate this freeze by adding text to new footnote NG144 stating that applications for new FSS (Earth-to-space) space and earth station licenses in the 12.7-12.75 GHz band will not be accepted after the effective date of this Report and Order. *See infra* Appx. B, Final Rules. As of the effective date of this Report and Order, we lift the existing temporary freeze in new space and earth station applications in the 12.7-12.75 GHz band and replace this temporary freeze with the freeze contained in new footnote NG144.

c. GSO ESIMs in 12.75-13.25 GHz

25. In addition to ubiquitous NGSO downlinks and individually licensed NGSO and GSO uplinks, we conclude that it is technically feasible, and would serve the public interest, to permit blanket-licensed uplinks in the 12.75-13.25 GHz band from ESIMs on aircraft at altitude and ships away from the coastline communicating with GSO space stations. Such operations are already permitted internationally.[67] Allowing flights and maritime voyages to use this spectrum in U.S. airspace and at sea promotes seamless and enhanced connectivity for these mobile applications of the FSS. This decision is reflected in a revised version of footnote NG527A.[68]

26. Further, limiting uplink ESIMs to GSO networks is consistent with international treatment, supported by commenters,[69] and promotes compatibility with NGSO downlinks (including to ESIMs) in this band.[70] And, unlike ubiquitously deployed ground terminals or ESIMs operating directly at airports or ports, transmitting ESIMs at altitude or at sea will not create bi-directional interference risk due to their geographic separation from potential victim NGSO downlink user terminals.[71] We observe that the international limits for GSO ESIMs transmissions in the 12.75-13.25 GHz band were adopted at WRC-23 to protect terrestrial receivers on the ground and FSS uplinks to NGSO space stations.[72] These limits were not adopted to protect NGSO FSS downlinks, which we are permitting within the United States on a primary basis. Uplinks to GSO space stations can cause harmful interference to NGSO receivers located in geographic proximity to the transmitting earth station. In order to mitigate potential wide-areas of interference, in addition to the international limits we limit transmissions from GSO ESIMS on aircraft to altitudes of three kilometers or higher while within the airspace of the United States.[73] This

[67] ITU Radio Regulations No. 5.496A; Resolution 121 (WRC-23).

[68] 47 CFR § 2.106(d)(527). Specifically, we amend paragraph (ii) of footnote NG527A to add the 12.75-13.25 GHz band (Earth-to-space) to the bands in which ESIMs may communicate with GSO space stations on a primary basis, and amend paragraph (iii) to add the 12.75-13.25 GHz band (space-to-Earth) to the bands in which ESIMs may communicate with NGSO space stations on a primary basis. In addition, we amend sections 100.275(n) and (o) to include the 12.75-13.25 GHz band with the frequency bands that are available for use by ESIMs communicating with GSO and NGSO FSS space stations through individual or blanket license applications. In light of our decision below to grandfather incumbent FS and MS operations in the band on a primary basis, our amendment to section 100.275 states that blanket licensing in the 12.75-13.25 GHz band is on an unprotected, non-interference basis with respect to current systems operating in the fixed and mobile service. *See infra* Appx. B, Final Rules.

[69] SES et al. Comments at 4. No commenters requested or supported permitting ESIM uplinks to NGSO space stations in the 12.7 GHz band. In contrast, NGSO satellite operators have expressed interest in communications with ESIMs solely in the downlink direction.

[70] While CTIA opposes ESIM uplinks as incompatible with flexible use terrestrial deployments in the 12.7 GHz band, we determine above to pursue more intensive satellite use of this band and decline to introduce flexible use terrestrial services. *See* CTIA Comments at 3; CTIA Reply Comments at 2, 5; *see also* Comsearch Comments at 1. With respect to the aeronautical and maritime ESIMs we authorize here, we note that PFD and EIRP limits have been developed internationally, and will be applied under our modified rules, for the protection of terrestrial services from ESIM transmissions.

[71] ESIMs use high directivity antennas to communicate with space stations, and thus ESIMs aboard aircraft and maritime vessels direct their transmissions away from the ground. By limiting these transmissions to when the ESIMs are at high altitude or far from the coast, it provides geographic separation from NGSO FSS receiver terminals on the ground and alleviates the risk of the ESIM transmissions causing harmful interference. This limitation is also likely to reduce the potential for interference from GSO ESIM uplinks to NGSO ESIM downlinks in the 12.75-13.25 GHz band, since aircraft and maritime vessels maintain substantial geographic separation from each other under normal operations.

[72] *See* Resolution 121 (WRC-23), Annex 2 (providing PFD limits to protect terrestrial services) and Annex 3 (providing EIRP limits to protect uplinks to NGSO space stations).

[73] We incorporate this requirement as part of our amendment of footnote NG527A. *See infra* Appx. B.

additional limitation will prevent transmissions by GSO ESIMs on aircraft, either on the ground or in the air, while they are in close geographic proximity to an NGSO FSS receiver.

27. *12.7-12.75 GHz*. In contrast to the 12.75-13.25 GHz band, the 12.7-12.75 GHz band has no international framework for ESIMs or an uplink FSS allocation outside Region 2. Accordingly, there is less benefit to opening the 12.2-12.7 GHz band for use by ESIM uplinks. We find that the 50 megahertz of spectrum in the 12.7-12.75 GHz band can serve as an appropriate buffer between the operation of ESIMs aboard aircraft and maritime vessels in the 12.75-13.25 GHz band and the operation of satellite television and FSS downlinks in the 12.2-12.7 GHz band.

d. Incumbent Terrestrial Licensees

28. We find that the 12.7 GHz band can be more intensively used for satellite communications while also preserving incumbent fixed microwave, BAS, and CARS operations, and without needing to consider "repacking" terrestrial operators to a subset of the band. Above, we decide to open the 12.7 GHz band to bi-directional satellite communications. To support compatibility between these different satellite uses, we limit ground earth station uplinks to individually licensed gateways and feeder links. This decision also benefits incumbent terrestrial systems, by reducing the number of uplink earth station sites, and eliminates any need for repacking, which is premised on ubiquitous transmitting earth station deployment in the band.[74] Nonetheless, given our analysis[75] and determination that the public interest would be served by making the 12.7 GHz band more available for satellite communications – including blanket-licensed receiving earth stations – there must be a cap on the number and operation of potentially interfering terrestrial stations. To balance reasonable incumbent continuity without stifling new entrant growth, we limit FS and MS deployments in the 12 GHz band to the grandfathering of current licensees,[76] subject to a 10-year sunset period, after which incumbent terrestrial operations' status will automatically change from co-primary to secondary.

29. *Sunset Period*. To ameliorate the burden on incumbents of relocating their operations to other bands or technologies, we are adopting a sunset period of ten years from the publication of this *Order* in the Federal Register for continued co-primary status of existing terrestrial stations.[77] After this date, grandfathered FS and MS systems may continue to operate in the 12.7 GHz band, but on an unprotected, non-harmful interference basis vis-à-vis FSS (Earth-to-space) and FSS (space-to-Earth) operations. The Commission sought comment on whether increasing the use of the 12.7 GHz band by satellite communications requires a sunsetting of the protection for incumbent FS and MS operations similar to that proposed in the *12.7 GHz Band NPRM*.[78] The Commission sought comment on sunset

[74] GSO space station operators support the repacking of existing terrestrial licensees into a smaller portion of the 12.7 GHz band in order to facilitate the authorization of blanket-licensed earth stations transmitting to GSO space stations. SES et al. Comments at 5-6. *But see* SpaceX Comments at 4; SpaceX May 1, 2026*, Ex Parte* Letter at 1. Repacking existing terrestrial licensees would also incur significant expense and based on the record there is no clear or straightforward mechanism for determining which entities would bear the costs of such repacking. *See* OTI/PK Comments at 9.

[75] *See infra* Appx. G (benefit-cost analysis of alternatives considered).

[76] Accordingly, in conjunction with the grandfathering provision and downgrading of FS and MS allocations to secondary, we make permanent the temporary freeze on applications for new fixed microwave, BAS, and CARS licenses that has been in effect since September 19, 2022. *See Freeze Public Notice*. Thus, no new terrestrial licenses will be granted. We will continue to accept and grant applications to renew existing grandfathered FS and MS licenses.

[77] *See 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, 13433, 13464, paras. 4, 70 (2000).

[78] *Spectrum Abundance NPRM*, 40 FCC Rcd at 3807, para. 35.

periods of three, five, or ten years for incumbent FS stations.[79] It did not seek comment on sunset periods for incumbent MS stations, but proposed to repack those existing MS operations to a 25-megahertz portion of the 12.7 GHz band.[80] Although NAB did not submit comments in response to the *Spectrum Abundance NPRM*, it previously advocated against a sunset date for FS and MS incumbents in the 12.7 GHz band used for BAS and CARS.[81] We observe that the 10-year sunset period that we adopt is the longest of the protection periods that was proposed for incumbent FS stations, which we find is reasonable due to the stated ability of FSS operations to deploy rapidly within the 12.7 GHz band even if they must avoid harmful interference to, and accept harmful interference from, incumbent terrestrial operations. A 10-year protection period is also less burdensome for incumbent MS stations than a forced repacking of their operations into another portion of the band, which may require new equipment to accommodate the shift in spectrum.[82]

30. *Allocations*. Since we have determined that the public interest would be served by using the 12.7 GHz band more intensively for satellite communications, we change the existing allocations for FS and MS in this band from primary to secondary in the U.S. Table to reflect the long-term intended use of this band primarily for satellite communications.[83] Thus, existing FS and MS licensees in the 12.7 GHz can continue to operate, at first on a primary basis and after 2036 on a secondary basis. The record generally reflects the difficulty of blanket-license receiving earth stations operating compatibly with FS and MS in the long term.[84] One commenter, however, claims that sharing between terrestrial fixed wireless and satellite service could be feasible using an automated spectrum access system, even if there is increased use of the 12.7 GHz band by both GSO uplinks and NGSO downlinks.[85] The record in this proceeding does not present sufficient information to develop such operating parameters or licensing procedures, and we do not want to delay the increased use of the 12.7 GHz band by satellite communications while developing such a record. Accordingly, we limit both FS and MS operations in the band on a primary basis to existing, incumbent systems, with a ten-year sunset of their protected status, and change the allocations for FS and MS in the table from primary to secondary status.

e. Protection of Federal Operations

31. *Adjacent Bands*. We also conclude that coordination of space and earth station operations in the 12.7 GHz band with Federal agencies is the most efficient way to permit increased use of the band by satellite services while protecting Federal allocated services – particularly Earth Exploration-Satellite Service (EESS), aeronautical radionavigation (ARNS), and SRS (active) – operating

[79] *12.7 GHz Band NPRM*, 38 FCC Rcd at 5323, para. 69.

[80] *Id.* at 5325, para. 75.

[81] NAB Reply (Sept. 8, 2023) at 4-5.

[82] Accordingly, we amend our rules as shown in Appendix B to include text in new footnote NG144 stating that grandfathered FS and MS systems in the 12.7 GHz will operate on a primary basis until [the date of publication of this Report and Order in the Federal Register plus 10 years]. After this date, grandfathered FS and MS systems may continue to operate in the 12.7 GHz band, but on a secondary basis vis-à-vis primary FSS (Earth-to-space) and FSS (space-to-Earth) operations.

[83] We determine that it is unnecessary to change or eliminate the allocation in the U.S. Table for terrestrial FS and MS operations in the non-Federal Table altogether, since existing incumbent operations may continue to be protected until 2036 under a grandfathered status and will be able to continue operations after 2036 provided their operations do not cause harmful interference to, or claim protection from, satellite communications in the 12.7 GHz band.

[84] For example, CTIA states that sharing the 12.7 GHz band among terrestrial and satellite services is only possible with individually licensed satellite earth stations that avoid co-frequency interference through geographic separation. *See* CTIA Comments at 5-6.

[85] WISPA Reply Comments at 3-5.

on a primary basis in the adjacent 13.25-13.4 GHz and 13.4-13.75 GHz bands from harmful interference. Comments in response to the *Spectrum Abundance NPRM* support collaboration with Federal agencies to protect adjacent-band Federal operations.[86] Given the range of Federal agencies that operate in these bands,[87] we find that such collaboration can be most efficiently done by coordination through the Interdepartment Radio Advisory Committee (IRAC), which contains representatives from all relevant Federal agencies.[88] NTIA has observed that Recommendation ITU-R M2008-1 provides characteristics and protection criteria for Federal airborne radars,[89] and we agree that these criteria can be used as part of the coordination process to protect aeronautical radionavigation operations in the adjacent 13.25-13.4 GHz band.

32. *Unallocated RAS.* Although there are no RAS allocations in the 12.7 GHz band, many RAS receivers have been built with a wide spectral range of operation to take advantage of opportunistic passive observation in spectrum allocated to active services, including the 12.7 GHz band.[90] Additionally, we observe that some RAS sites are utilized for deep space observations (e.g., the Green Bank Telescope in West Virginia observed Artemis when Goldstone was offline recently).[91] Some commenters ask the Commission to adopt specific requirements to protect these observations.[92] Comments in response to the *Spectrum Abundance NPRM* support a conclusion that space and earth station licensees should be able to avoid harmful interference to RAS observations.[93] We note the by-now extensive record of successful coordination between satellite operations and radio astronomy systems operating in the nearby 10.7-11.7 GHz bands.

2. 42 GHz Band

33. The 42 GHz band presents an ideal opportunity to make spectrum rapidly available for satellite use in the United States. As widely supported on the record, we add a primary FSS (space-to-Earth) allocation to the 42 GHz band,[94] available for downlinks from both GSO and NGSO space

[86] SES et al. Comments at 7 (stating that GSO satellite operators would "work with NTIA on protection measures tailored for FSS uplinks, such as an [OOBE] limit and/or a possible guard band"); SIA Comments at 6 ("SIA is committed to working cooperatively with NTIA to consider appropriate protection measures, including potential [OOBE] limits or aggregate interference limits, and/or a 25-megahertz guard band.") While some commenters suggest that OOBE limits could be considered as a means of protection, no specific OOBE limits have been proposed on the record. *See* SES et al. Comments at 7; SIA Comments at 6. Appropriate OOBE limits could be developed during the coordination process with NTIA.

[87] *See Spectrum Abundance NPRM*, 40 FCC Rcd at 3809, para. 41.

[88] We note that since NASA and NSF are part of the IRAC, space and earth station operators in the 12.7 GHz band can coordinate their proposed operations with both in-band and adjacent band Federal spectrum users through the IRAC.

[89] Recommendation ITU-R M.2008-1, Characteristics and protection criteria for radars operating in the aeronautical radionavigation service in the frequency band, 13.25-13.4 0 GHz (Feb. 2014); *see also Spectrum Abundance FNPRM*, 40 FCC Rcd at 3810, para. 43.

[90] *See* American Astronomical Society Comment at 2.

[91] https://greenbankobservatory.org/news/gbt-artemis-ii/

[92] *See generally* American Astronomical Society Comments; CORF Comments; NRAO Comments.

[93] CORF Comments at 10-11; NRAO Comments at 2; SpaceX Comments at 5. *But see also* CORF Comments at 11-12.

[94] Satellite commenters universally support a primary allocation. Amazon Kuiper Comments at 3-4 & n.10; AST Comments at 4; Logos Comments at 6; SIA Comments at 7; SpaceX Comments at 6. We agree that a primary allocation, consistent with international use, will better support reliable and long-term development of the band for fixed earth station sites by ensuring protection from future co-primary terrestrial stations, in contrast to a secondary allocation. One commenter, however, suggests that a secondary FSS allocation would maximize shared use of the band among satellite and terrestrial operations, while also protecting Federal radioastronomy operations in the

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stations[95] to individually licensed gateway and feeder-link earth stations and subject to the same PFD limits that apply to FSS operation in the adjacent band for the protection of terrestrial operators.[96] Opening this 500 megahertz of spectrum that is already allocated[97] and used[98] for primary FSS downlinks internationally, and that is adjacent to the 37.5-42 GHz downlink band currently used in the United States,[99] will further support V-band gateway and feeder-link traffic and may alleviate coordination hurdles in nearby UMFUS bands by providing alternative frequencies for satellite downlinks.[100]

34. At the same time, limiting earth station deployment to individually licensed gateway and feeder-link sites will promote long-term compatibility with the FS, in conjunction with the downlink PFD limits extended from the adjacent band,[101] and will also promote sharing between GSO and NGSO system earth stations, by enabling geographic separation to help resolve interference concerns through a streamlined "light licensing" authorization procedure.[102] Because of these benefits, and as supported on the record,[103] we decline to authorize blanket-licensed FSS earth stations in the 42 GHz band and instead adopt a new footnote, NG150, which specifies that use of the band is limited to gateway and feeder link earth stations.[104] Further, because good-faith coordination among GSO and NGSO operators under "light

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adjacent 42.5-43.5 GHz band. OTI/PK Comments at 11. As discussed below, we find that it is possible to permit operations of FSS downlinks on a primary basis while still preserving possible future use of the band for terrestrial fixed services under the existing primary FS allocation and while protecting RAS in the adjacent band. Accordingly, we see no reason not to allocate FSS downlinks in the 42 GHz band on a primary, rather than secondary, basis.

[95] No commenter proposes limiting the allocation to either GSO or NGSO transmissions, and we find no reason to do so. *See* Amazon Comments at 6; AST Comments at 3; SES et al. Comments at 10; SIA Comments at 8; SpaceX Comments at 6. In addition, no commenter proposed an uplink FSS (Earth-to-space) allocation in this band. *See* Amazon Kuiper Comments at 3, n.7.

[96] *See infra* Appx. B, Final Rules.

[97] 47 CFR § 2.106(a); Amazon Kuiper Comments at 3; AST Comments at 3; CSF Comments at 4; Logos Comments at 6; SES et al. Comments at 10.

[98] AST Comments at 3 (stating that AST uses the 42 GHz band for its feeder links outside the United States).

[99] Amazon Kuiper Comments at 2; Amazon Reply Comments at 3; Logos Comments at 6-7; SES et al. Comments at 13.

[100] *See* Amazon Kuiper Reply Comments at 4; OTI/PK Comments at 10.

[101] Specifically, we adopt the same PFD limits in the 42 GHz band as the existing PFD limits for the 40.5-42 GHz band for both GSO and NGSO space stations. We implement this change by amending the text of subsections (i) and (j) of section 100.212 to extend the upper edge of the band from 42 GHz to 42.5 GHz. 47 CFR § 100.212(i), (j).

[102] AST Comments at 4; Comsearch Comments at 3.

[103] AST Comments at 4; Comsearch Comments at 3. AST specifically argues that the nature of millimeter waves favors the use of the 42 GHz band for fixed, high-gain parabolic dish antennas, rather than ubiquitously deployed user terminals or ESIMs. AST Comments at 4.

[104] *See infra* Appx. B, Final Rules. In addition, individual licensing may facilitate coordination with Federal operations in adjacent bands because the location of the downlink transmissions will be more geographically limited. In contrast, Amazon argues that blanket licensing would be more efficient for both licensees and Commission staff and would not create a risk of harmful interference due to the "greenfield" nature of the band and other interference mitigations measures that could be adopted. Amazon Kuiper Comments at 7. We anticipate that "light licensing" will present an efficient authorization framework for all parties and conclude that the sharing burdens imposed by co-primary, blanket-licensed earth stations in the 42 GHz band have not been justified on the record. We also find that gateway and feeder link stations are likely to be the most rapidly introduced and widespread use of the 42 GHz band for satellite communications, since equipment is already available due to use of the band for such operations outside the United States. Limiting use of the 42 GHz band to such individually licensed earth stations supports this use.

licensing" will address intra-FSS spectrum sharing, we need not consider additional technical backstops for NGSO-GSO compatibility that might otherwise be needed to enable ubiquitous FSS earth stations.[105]

35. *Terrestrial Allocations*. The 42 GHz band is currently allocated only to terrestrial services, but there are no terrestrial deployments in either the FS or MS primary allocations.[106] Nonetheless, we conclude that future FS deployments in the 42 GHz band could co-exist with satellite downlinks by applying the PFD limit on satellite transmissions used internationally in this band,[107] and by enabling site-based coordination through "light licensing" to ensure that high-power FS stations do not cause harmful interference to receiving gateway and feeder-link earth stations. Accordingly, we retain the primary allocation to the FS.[108] Future MS deployments, however, would not be limited to specific geographic sites readily coordinated through light licensing and instead could pose significant constraints on FSS users if entitled to cause harmful interference under a co-primary allocation. Therefore, to permit future MS deployment while also ensuring the long-term viability of FSS earth stations, in addition to supporting future FS use, we change the MS allocation from primary to secondary and require MS stations to protect fixed FSS and FS sites.

36. *Light Licensing*. Rapidly introducing satellite services into the 42 GHz band, to the ultimate benefit of consumers, will depend not only on clear sharing rules but also on an earth station licensing process that is as efficient as possible. We find the Commission's "light licensing" framework best suited to this task.[109] As supported on the record,[110] light licensing would leverage automation[111] and

[105] *See* ITU Radio Regulations Nos. 22.5L and 22.5M. Accordingly, proposals by some commenters to apply these international, technical protection criteria are unnecessary under our site-coordination approach. *See* SES et al. Comments at 13 & n.37; SES et al. Reply Comments at 9; Amazon Comments at 6, n.21.

[106] CSF Comments at 4. The FS and MS have been allocated as primary in the 42 GHz band since 1998. *Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz, and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations*, Report and Order, 13 FCC Rcd 24649 (1998); *see also* SIA Comments at 8-9.

[107] *See* Amazon Kuiper Comments at 5-6.

[108] We do not, however, adopt any rules or procedures for licensing FS operations in the 42 GHz band, and given potential remaining interest in terrestrial use of this band in the future defer the question of terrestrial use of the 42 GHz band to a future proceeding that will take into account the increased use of the 42 GHz band by FSS (space-to-Earth) operations on a primary basis. We note that the Commission has previously sought comment in GN Docket No. 14-177 on proposals to add Federal FS and MS allocations to the 42 GHz band and a framework under which both Federal and non-Federal FS and MS operations could share the 42 GHz band on a co-primary basis. *See Use of Spectrum Bands Above 24 GHz for Mobile Radio Services,* Third Report and Order, Memorandum Opinion and Order, and Third Notice of Proposed Rulemaking, 33 FCC Rcd 5576, 5598, para. 53 (2018), citing *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8155, para. 407. The *Spectrum Abundance FNPRM* did not seek comment on these proposals, and we take no action on these proposals.

[109] Under the "light licensing" framework adopted for terrestrial operations in the 70/80/90 GHz band proceeding, an unlimited number of non-exclusive nationwide licenses are issued for all available spectrum, and these licenses serve as prerequisites for registering individual point-to-point links that must be registered with a third-party database and coordinated with NTIA prior to operation. *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 39 FCC Rcd 886, 887, para. 3 (2024); *see also* SpaceX Comments at 11.

[110] Amazon Kuiper Reply Comments at 6; Comsearch Comments at 2-3; CSF Comments at 4; Logos Reply Comments at 3; Micronet Comments at 1; OTI/PK Comments at 9-14; SpaceX Comments at 7-8; SpaceX Reply Comments at 1-2; WISPA Reply at 5-6.

[111] *See* Amazon Kuiper Reply Comments at 6.

a unified,[112] third-party database of millimeter-wave operations to facilitate earth station coordination with non-Federal FS sites,[113] as well as adjacent-band Federal operations,[114] by incorporating coordination zones, geographic separation, and other spectrum sharing mechanisms. Yet key implementation details of the light licensing framework, including how the database would be established and how the manager selected, were not addressed with specificity in the current record but are touched on by other, ongoing Commission proceedings.[115]

37. Accordingly, we defer adoption of the mechanics of a light licensing regime for the 42 GHz bands either to these proceedings or to any other proceeding that the Commission may institute to establish light licensing regimes for millimeter wave bands.[116] Those proceedings can address concerns on the record that require implementation details, including regarding interference analyses and dispute resolution capabilities.[117] Until the light licensing approach is implemented, we will process FSS applications within existing licensing rules.[118]

38. *Adjacent-Band Federal Operations*. While there are no Federal allocations in the 42 GHz band, the adjacent 42.5-43.5 GHz band has primary Federal allocations to the FSS (Earth-to-space), FS, MS (except aeronautical mobile), and RAS.[119] We adopt internationally developed power limits for the protection of radio astronomy sites by new FSS downlinks in the 42 GHz band, and conclude that no additional measures are technically necessary to protect Federal satellite or terrestrial operations in the adjacent band. Further, we find that the risk of interference from Federal stations into newly authorized

[112] SpaceX Reply Comments at 6-7.

[113] Logos Reply Comments at 4; SpaceX Reply Comments at 8. Indeed, commenters stress that light licensing will allow FSS earth stations to coordinate more easily with terrestrial users and potentially eliminate the need for rules that make it harder to coordinate in particular millimeter wave bands. Amazon Kuiper Reply Comments at 6; Logos Reply Comments at 3; OTI/PK Comments at 12-15; SpaceX Reply Comments at 7.

[114] SpaceX Reply Comments at 8. The database will also help operators monitor, investigate, and resolve any instances of reported harmful interference. *Id.* at 8-9.

[115] *Space Modernization Report and Order and FNPRM* at para. [112] (adopting a two-step nationwide, non-site-specific licensing approach); *70/80/90 GHz Modernization Order and FNPRM*, 39 FCC Rcd at 916, 917, paras. 82, 87-91 (seeking comment on incorporating earth station gateways in the light licensing database currently used for terrestrial fixed links so that database could serve as a unified portal for operations in the 70/80/90 GHz bands); *Facilitating More Intensive Use of Upper Microwave Spectrum*, SB Docket No. 25-305, Notice of Proposed Rulemaking, FCC 25-705, at paras. 18-24 (rel. Oct. 29, 2025) (seeking comment on light licensing as a way to expedite earth station siting in UMFUS bands).

[116] We note that the Commission has already adopted a light licensing regime for the 92-95 GHz band as part of its 70/80/90 GHz band proceeding and has sought comment on whether and how to incorporate satellite earth stations into the database. *See 70/80/90 GHz Modernization Order and FNPRM*, 39 FCC Rcd. 886.

[117] CTIA Reply Comments at 7-8. We note that we adopt, below, specific PFD and EPFD limits on satellite transmissions in the 42 GHz band for the protection of adjacent band RAS observations, and do not rely on light licensing for that purpose, although it may be helpful. *But see* IEEE GRSS Reply Comments at 3-4 (arguing that light licensing framework is not designed to manage aggregate interference from transmitters to passive sensing, is insufficient to protect mobile passive sensors on orbiting satellites and relies on protection criteria that often are not stringent enough to protect sensitive passive receivers). NRAO Comments at 9 (stating that extension of light licensing regime developed for terrestrial FS links at 70/80/90 GHz to satellite operations in the W-band is "wildly premature"); Ravnitsky Comments at 4 (stating that licensing processes for millimeter wave earth stations "must bake in passive-science safeguards from day one").

[118] We have addressed the technical parameters of operations of space and earth stations, including the operations of GSO and NGSO systems in the same band, their status vis-à-vis terrestrial users in the band, and methods to protect Federal operations from potential harmful interference. We anticipate that these technical operational parameters will be considered when establishing the mechanics of light licensing in the millimeter wave bands.

[119] 47 CFR § 2.106(a).

FSS downlinks is manageable.

39. With respect to Federal satellite operations, as a technical matter we find that the downlink transmission path in the 42 GHz band will not create a risk of harmful interference to Federal satellite operations in the 42.5-43.5 GHz band because the Federal receivers will be in space, pursuant to the Federal uplink allocation, and will further be sufficiently separated in geometry and frequency to attenuate any out-of-band interference.[120] For Federal terrestrial operations, we find that compliance with the PFD limits that will protect in-band non-Federal terrestrial operations will offer even greater protection to adjacent band Federal terrestrial stations, due to frequency separation, and thereby provide sufficient protection. Indeed, the greater interference risk is from transmitting Federal earth stations and terrestrial stations into adjacent band non-Federal receiving earth stations. We view this risk as manageable,[121] however, through geographic separation and coordination facilitated by the "light licensing" regime, and satellite operators will be aware of the potential adjacent-band environment when configuring their systems to make use of the 42 GHz band.

40. With respect to radioastronomy sites, existing footnote US211 urges space station applicants in bands including the 42 GHz band to "take all practicable steps to protect radio astronomy observations in adjacent bands from harmful interference."[122] While this footnote does not impose any specific protection requirements for RAS in the 42.5-43.5 GHz band, we conclude that RAS sites will be adequately protected if space station transmissions in the 42 GHz band adhere to PFD and EPFD limits that apply internationally to the FSS in the 42 GHz band.[123] Both RAS and satellite commenters support applying these limits.[124] In contrast, there is no technical basis on the record for adopting differing protections for the RAS, including by transforming the per-system PFD and EPFD limits into more restrictive aggregate limits,[125] or relying on ITU guidance rather than adopted provisions.[126] [We note the by-now extensive record of successful coordination between satellite operations and radio astronomy systems operating in other bands.

C. Costs and Benefits

41. We have carefully reviewed the record in this proceeding and conclude that the benefits of the changes we adopt today exceed the costs. Our evaluation of costs and benefits is contained in Appendix G.

III. FURTHER NOTICE OF PROPOSED RULEMAKING (*SPECTRUM ABUNDANCE*

[120] *See* AST Comments at 4.

[121] *See* SIA Comments at 9.

[122] 47 CFR §§ 2.106(a), (c)(211).

[123] *Id.* §§ 2.106(b)(551)(i) and (ii). We will require space station applicants to certify as part of an application to transmit in the 42 GHz band that the PFD or EPFD by the space station or space stations will not exceed the limits set forth in footnotes 5.551H and 5.555I at protected RAS stations that were notified to the ITU by certain dates. A list of notified RAS stations is available online via the ITU at https://www.itu.int/en/ITU-R/space/Pages/RadioastronomyStations.aspx. Footnotes 5.551H and 5.555I also state that Resolution 743 (WRC-03) applies in Region 2, which must also be taken into account when certifying that the limits of footnotes 5.551H and 5.551I will not be exceeded. We implement this certification requirement by amending our part 100 rules to include it as part of a GSO or NGSO space station application to transmit in the 42 GHz band. *See infra* Appx. E.

[124] Amazon Comments at 5; CORF Comments at 20; Logos Comments at 7; SES et al. Reply Comments at 8; SIA Comments at 9; SpaceX Comments at 7.

[125] *See* proposal in CORF Comments at 20.

[126] *See* proposal in AAS Reply Comments at 2. In addition, while SIA previously proposed differing protections for RAS in the 42.7-43.5 GHz band, *see Spectrum Abundance NPRM* at para. 54, it does not endorse that prior proposal in its comments to the *Spectrum Abundance NPRM*, and CORF opposes the proposal.

***FNPRM*)**

42. In this *Further Notice of Proposed Rulemaking*, we seek comment on additional spectrum bands that could be used for new or more intensive satellite communications, particularly by NGSO space stations, than currently possible under existing allocations and rules.[127] In the sections below, we identify several bands for examination in the Ku-, Ka-, and new "D-" bands above 100 GHz. For each of these spectrum bands, we seek comment on the suitability for satellite communications, the potential types of satellite communications that might be provided in the band, and in which direction (for example, space-to-Earth or Earth-to-space). In particular, for each band we seek comment on what changes to the U.S. Table and our rules would be needed to use these bands more intensively for satellite communications, and the specific manner in which those changes could be effectuated (for example, by creation of an allocation, or through a footnote to the U.S. Table).

43. We seek comment in general on whether additional spectrum resources are needed for satellite communications in light of our action above to open the 12.7 GHz and 42 GHz bands for new and more intensive satellite use. Comments should focus on the expected use of additional satellite spectrum resources and on how making additional spectrum available will permit the provision of services that are not currently available or the more efficient or expanded provision of existing services. We also seek comment generally on the impact to small businesses and on what, if any, are needed internationally, to effectuate these changes, either through bi-lateral or multi-lateral agreements with other countries.

A. Ku-Band

44. The Ku-band commonly refers to a range of frequencies from 12-18 GHz and is already extensively used for satellite communications under existing spectrum allocations. The "conventional Ku-band" is defined as the 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) bands.[128] The "extended Ku-band" is defined as the 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), and 13.75-14.0 GHz bands (Earth-to-space) bands.[129] Both the conventional and extended Ku-bands are currently used to provide FSS, for satellite communications in GSO and NGSO. We now seek comment on whether other spectrum bands, located near or adjacent to these conventional and extended Ku-bands, could be used more extensively for satellite communications through changes to our rules and to the U.S. Table of Allocations.

1. 13.75-14.0 GHz

45. We seek comment on whether more intensive use could be made of the extended Ku-band frequencies of 13.75-14.0 GHz if current limitations placed on non-Federal use of this band for FSS uplinks were modified or eliminated.

46. *TDRSS Protection*. Footnote US337 to the U.S. Table requires that FSS earth stations licensed by the FCC operating within 13.75-13.8 GHz be coordinated with NTIA on a case-by-case basis in order to minimize harmful interference to the space-to-space link of the Tracking and Data Relay Satellite System (TDRSS) forward link-to-low earth orbit (LEO) operated by NASA.[130] NASA has announced, however, that as of November 2024 new missions will not be assigned to the TDRSS system,

[127] These are in addition to consideration of the 51.4-52.4 GHz, 92.0-94.0 GHz, 94.1-100 GHz, 102.0-109.5 GHz, and 111.8-114.25 GHz outstanding from the *Spectrum Abundance NPRM*.

[128] 47 CFR § 25.103.

[129] *Id*.

[130] *Id.* §§ 2.106(a), (c)(337). The TDRSS system consists of a number of GSO satellites distributed over the Atlantic, Pacific, and Indian Oceans that provide near-continuous information relay services for NASA space missions, including the Hubble Space Telescope and the International Space Station. *See* Jacqueline E. Zito, *Tracking and Data Relay Satellites*, (Dec. 05, 2025) www.nasa.gov/mission/tracking-and-data-relay-satellites.

although existing missions will continue to use TDRSS until the seven currently active GSO satellites are decommissioned.[131]

47. We seek comment in general on the extent to which US337 restricts the use of the 13.75-14.0 GHz band for non-Federal FSS (Earth-to-space) operations, particularly for small blanket-licensed earth stations that communicate to NGSO FSS space stations, and whether those restrictions could be lessened or removed without causing harmful interference to remaining TDRSS operations. We seek comment on whether the requirements of US337 could be modified or eliminated, considering the intent to retire the TDRSS system when the current seven GSO satellites are decommissioned. Is it possible to plan for the expected decommissioning of the remaining TDRSS satellites by providing a sun-set or other time limit on the applicability of footnote US337? In addition, we seek comment on whether footnote US337 should be modified to include these changes or whether they should be made part of our rules for satellite communications under part 25.

48. Alternatively, could restricting the coordination requirement under US337 to those earth stations intending to transmit within a certain distance of TDRSS ground facilities be effective for operations in the 13.75-14.0 GHz band in place of case-by-case coordination? We observe our rules already require operations of ESIMs transmitting in the 14.0-14.5 GHz band to coordinate with NASA through NTIA when operating within 125 km or within radio line of sight of TDRSS ground stations in Guam, White Sands, NM, and Blossom Point, MD.[132] Could footnote US337 be modified to limit case-by-case coordination requirements to FSS transmitting earth stations within 125 km or radio line of site of TRDSS ground stations, instead of requiring case-by-case coordination of all FSS transmitting earth stations in the 13.75-14.0 GHz band?

49. *Minimum Antenna Size*. We seek comment on whether limits on minimum antenna size and power emissions for FSS earth stations transmitting in the 13.75-14.0 GHz band could be relaxed to permit smaller transmitting antennas while providing adequate protection to other spectrum users.[133] Footnote US356 specifies that FSS earth stations in the 13.75-14.0 GHz band must have a minimum antenna diameter of 4.5 meters and must operate with EIRP of at least 68 dBW and not exceed 85 dBW.[134] In addition, footnote US357 requires that non-Federal FSS operations in the 13.75-14.0 GHz band protect Federal GSO space stations in the SRS by limiting the density of emissions from earth stations.[135] Are these limitations and restrictions needed in light of the requirement of US337 to coordinate transmitting FSS earth stations in the 13.75-14.0 GHz band with NTIA on a case-by-case basis? Or does the existence of these limitations and restrictions obviate the need for case-by-case coordination under footnote US337?

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[131] *See* Korine Powers, *Tracking and Data Relay Satellites*, *(TDRS)* (Jul. 19, 2025) www.nasa.gov/missions/tdrs/tracking-and-data-relay-satellite-tdrs-generations-of-spacecraft/.

[132] 47 CFR § 25.228(j).

[133] This matter is also being studied under WRC-27 agenda item 1.2. *Office of International Affairs Seeks Comment on Recommendations Approved by the World Radiocommunication Conference Advisory Committee*, OIA Docket No. 24-30, Public Notice, DA 26-182, at 20 (rel. Feb. 23, 2026).

[134] 47 CFR §§ 2.106(a), (c)(356).

[135] *Id.* §§ 2.106(a), (c)(357). The EIRP density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in any 6 MHz band from 13.77 to 13.78 GHz. *Id*. at (i)(A). The EIRP density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in any 6 MHz band from 13.77 to 13.78 GHz. *Id*. at (i)(B). Automatic power control may be used to increase the EIRP density in any 6 MHz band in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an EIRP of 71 dBW or 51 dBW, as appropriate, in any 6 MHz band in clear-sky conditions. *Id*. at (ii).

2. 14.5-15.35 GHz

50. We seek comment on whether to make the 14.5-15.35 GHz band accessible for satellite communications by adding an allocation for FSS in the Earth-to-space direction. The 14.5-15.35 GHz band is adjacent to the 14.0-14.5 GHz band where FSS (Earth-to-space) has an existing primary allocation.[136] Adding an allocation for FSS (Earth-to-space) in the 14.5-15.35 GHz band would provide an additional 850 megahertz of contiguous uplink capacity that can be used for satellite communications.[137]

51. *Allocations*. Internationally, in the 14.5-14.8 GHz band there is already an allocation for FSS (Earth-to-space) on a primary basis in all ITU regions, alongside primary allocations for FS and MS and a secondary allocation for Space Research Service (SRS).[138] In the 14.8-15.35 GHz bands, there are no allocations for FSS internationally, but there are primary allocations for FS and MS and a secondary allocation for SRS, and secondary allocations for the SRS (passive) and ESS (passive) in the 15.20-15.35 GHz band.[139]

52. Domestically, in the Federal Table, there are primary and secondary allocations for numerous services, differing by segmentations of the 14.5-15.35 GHz band:[140]

- 14.5-14.7145 GHz: Primary allocation for FS and secondary allocations for MS and SRS;
- 14.7145-14.8 GHz: Primary allocation for MS and secondary allocations for FS and SRS;
- 14.8-15.1365 GHz: Primary allocations for MS and SRS and secondary allocation for FS; and
- 15.1365-15.35 GHz: Primary allocations for FS and SRS and secondary allocation for MS.

53. There are no existing non-Federal allocations in the range of 14.5-15.35 GHz, but footnote US310 to the U.S. Table provides that in the 14.896-15.121 GHz bands, non-Federal space stations in the Space Research service may be authorized on a secondary basis to transmit to TDRSS satellites subject to case-by-case conditions.[141] Footnote US211 also applies, which urges, in relevant part, that applicants for airborne or space station assignments in the 15.1365-15.35 GHz band to take all practicable steps to protect radio astronomy observations in adjacent bands from harmful interference.[142] Such radio astronomy observations, however, are protected from unwanted emissions only if those emissions exceed those allowed by technical standards or service criteria set for the space stations, and only at enumerated radio astronomy sites.[143]

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[136] 47 CFR § 2.106(a).

[137] We note that the 14.8-15.35 GHz portion is one of the frequency ranges currently being studied under WRC-27 agenda item 1.7 to support future sixth generation (6G) terrestrial wireless services, also known as International Mobile Telecommunications towards 2030 and beyond (IMT-2030), either on a regional or global basis. *Office of International Affairs Seeks Comment on Recommendations Approved by the World Radiocommunication Conference Advisory Committee*, OIA Docket No. 24-30, Public Notice, DA 24-774, at 6 (rel. Aug. 6, 2024).

[138] 47 CFR § 2.106(a).

[139] *Id*. §§ 2.106(a), (b)(339)

[140] *Id*. § 2.106(a).

[141] *Id.* §§ 2.106(a), (c)(310).

[142] *Id.* §§ 2.106(a), (c)(211)

[143] *Id.* §§ 2.106(a), (c)(74). The radio astronomy sites are enumerated in section 2.106(c)(385) of the Commission's rules. *Id.* §§ 2.106(a), (c)(385).

54. *Comment Sought*. We seek comment on whether it would serve the public interest to add an allocation for FSS (Earth-to-space) on either a primary or secondary basis in the entire 14.5-15.35 GHz band or portion(s) thereof. Could FSS earth stations transmitting within the 14.5-15.35 GHz band be geographically restricted in a manner that protects existing Federal operations in the band, particularly the radioastronomy sites enumerated in our rules?[144] Could such geographical separation be sufficient on its own to provide interference protection, or are additional operational or technical limitations, such as out of band emission (OOBE) limits, required? Should any other restrictions on satellite communications be adopted, such as limiting use to either GSO or NGSO space stations, or prohibiting ESIMs or blanket licensed earth stations?

55. We also seek comment on whether it is feasible at this time to add an allocation for satellite communications in the 14.8-15.35 GHz band that is also being considered for a global IMT allocation. If the Commission were to adopt a domestic allocation for IMT in the 14.8-15.35 GHz band, is it possible to permit FSS uplinks in 14.5-14.8 GHz without causing harmful interference to IMT operations or otherwise constrain the use of the 14.8-15.35 GHz band for IMT? What operational or technical restrictions or limitations are possible or necessary in such a case to protect potential IMT operations in the adjacent 14.8-15.35 GHz band? If technical restrictions or limitations are not possible, should the Commission still consider adding an allocation for FSS (Earth-to-space) anywhere in the 14.5-15.35 GHz band?

3. 15.43-15.63 GHz

56. We seek comment on potential ways to make the 15.43-15.63 GHz band more accessible for satellite communications.

57. *Allocations*. Internationally, the 15.43-15.63 GHz band is allocated on a primary basis in all three ITU regions for FSS (Earth-to-space), Radiolocation, and Aeronautical Radionavigation.[145] International footnote 5.511A limits use of the 15.43-15.63 GHz band by FSS (Earth-to-space) to feeder links of NGSO mobile-satellite service (MSS).[146] Additionally, the ITU and International Civil Aviation Organization (ICAO) have identified this band as the leading candidate for internationally standardized detect-and-avoid (DAA) systems for use by ground and airborne stations.[147] Domestically, there is an allocation for FSS (Earth-to-space) on a primary basis in this band for non-Federal operations.[148] Footnote US359 to the U.S. Table restricts the use of the FSS allocation domestically to non-Federal feeder links of NGSO MSS and requires coordination of earth stations in this band with NTIA.[149] In this band, footnote US211 also applies, which urges, in relevant part, that applicants for airborne or space station assignments in, among others, the 15.4-15.7 GHz band to take all practicable steps to protect radio astronomy observations in adjacent bands from harmful interference.[150] Such radio astronomy observations, however, are protected from unwanted emissions only if those emissions exceed those allowed by technical standards or service criteria set for the space stations, and only at enumerated radio

[144] 47 CFR §§ 2.106(a), (c)(74) & (c)(385).

[145] *Id.* § 2.106(a).

[146] *Id.* §§ 2.106(a), (b)(511)(i). MSS is defined as a "radiocommunication service: (1) Between mobile earth stations and one or more space stations, or between space stations used by this service; or (2) Between mobile earth stations by means of one or more space stations." *Id.* § 2.1.

[147] ITU Working Party 5B, "Characteristics of and Protection Criteria for Detect and Avoid Radars and Aircraft Landing Systems Operating in the Aeronautical Radionavigation Service in the Frequency Band 15.4-15.7GHz Band." May 19-28th, 2026. https://www.itu.int/md/R23-WP5B-C-0526/en

[148] *Id.* § 2.106(a).

[149] 47 CFR §§ 2.106(a), (c)(359).

[150] *Id.* §§ 2.106(a), (c)(211).

astronomy sites.[151]

58. Domestically, the 15.43-15.63 GHz band also contains existing primary allocations for Federal operations in the Radiolocation and Aeronautical Radionavigation services.[152] Footnote US511E to the U.S. Table, however, limits the use of the band by the radiolocation service to Federal systems requiring larger bandwidth than that which can be provided in the 15.7-17.3 GHz band and prohibits radiolocation service operations from causing harmful interference or claiming protection from radars operating in the Aeronautical Radionavigation service.[153]

59. *Comment Sought*. We seek comment on whether the 15.43-15.63 GHz band could be used more intensively for satellite communications by modifying or eliminating the restrictions of US359 in order to permit non-Federal FSS operations in the Earth-to-space direction on a primary basis beyond NGSO MSS feeder links. We observe that the Commission has authorized Globalstar to use the 15.43-15.63 GHz bands for its feeder links.[154] The Commission has also authorized SpaceX to provide FSS uplinks in the 15.43-15.63 GHz band on an unprotected, non-interference basis.[155] We seek comment on whether it is still necessary to limit use of the primary allocation for FSS (Earth-to-space) in the 15.43-15.63 GHz band to NGSO MSS feeder links. To what extent could the band be used more extensively for satellite communications if the limitation of US359 were modified or eliminated? To what extent is the limitation of US359 still required to protect NGSO MSS feeder link operations? Is such protection required throughout the United States, or is geographic separation of transmitting earth stations possible to allow deployment of NGSO FSS earth stations in this band other than for NGSO MSS feeder links? If geographic separation is possible to protect NGSO MSS feeder links, what are the appropriate metrics for determining the amount of geographic separation required?

B. Ka-Band

60. The Ka-band is already extensively used for satellite communications pursuant to existing spectrum allocations. The "conventional Ka-band" is defined as the 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space) bands, which the Commission has designated as primary for GSO FSS operation.[156] The "extended Ka-band" is defined as the 17.3-18.3 GHz (space-to-Earth), 18.8-19.4 GHz (space-to-Earth), 19.6-19.7 GHz (space-to-Earth), 27.5-28.35 GHz (Earth-to-space), and 28.6-29.1 GHz (Earth-to-space) FSS bands.[157] Both the conventional and extended Ka-bands are currently used to provide FSS, both for satellite communications in both GSO and NGSO. We now seek comment on whether the conventional and extended Ka-bands, or other spectrum bands located near or adjacent to the conventional and extended Ka-bands, could be used more extensively for satellite communications through changes to our rules and to the U.S. Table of Allocations.

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[151] *Id.* §§ 2.106(a), (c)(74). The radio astronomy sites are enumerated in section 2.106(c)(385) of the Commission's rules. *Id.* § 2.106(c)(385).

[152] *Id.* § 2.106(a).

[153] *Id.* §§ 2.106(a), (c)(511E).

[154] *Application of Globalstar, L.P.*, Order and Authorization, 16 FCC Rcd 13739 (2001).

[155] *See SpaceX V3 Grant*; *Space Exploration Holdings, LLC, Request for Orbital Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System*, Order and Authorization, 37 FCC Rcd 14882 (2022) (*SpaceX Gen2 First Partial Grant*), pet. for recon. pend.; *Space Exploration Holdings, LLC, Application for Modification of Authorization of the SpaceX V-band NGSO Satellite System*, Grant Stamp. ICFS File No. SAT-MOD-20230322-00062 (SB, SPPD, granted-in-part/dismissed-in part Oct. 13, 2023) (*SpaceX First V-band Modification Grant*).

[156] 47 CFR § 25.103.

[157] *Id*.

1. 18.6-18.8 GHz

61. *Allocations*. The 18.6-18.8 GHz band is part of the conventional Ka-band that is designated as primary for GSO FSS operations.[158] Domestically, this band is allocated on a primary basis for both Federal and non-Federal operations for FSS (space-to-Earth), EESS (passive), and Space Research (passive).[159] For non-Federal operations, the allocation for FSS (space-to-Earth) is subject to footnotes NG164, which limits the use of 18.6-18.8 GHz by FSS to GSO networks,[160] and NG527A under which ESIMs communications in the 18.6-18.8 GHz band may be authorized to communicate with GSO space stations on a primary basis.[161] Non-Federal operations in 18.6-18.8 GHz band are also subject to footnote US255, which places limits on the maximum space station emissions.[162] Internationally, in ITU Region 2 there are primary allocations in the 18.6-18.8 GHz band for EESS (passive), FSS (space-to-Earth), MS (except aeronautical mobile), and SRS.[163] The primary allocation for FSS (space-to-Earth) in ITU Region 2 is subject to international footnotes 5.516B and 5.522B. Footnote 5.516B identifies the 18.3-19.3 GHz band in ITU Region 2 for high-density FSS (space-to-Earth) applications, but also states that this identification does not preclude use of the band by other FSS applications or by other services to which these frequency bands are allocated on a co-primary basis and does not establish priority in the ITU Radio Regulations among users of the frequency band.[164] Footnote 5.522B limits the use of the 18.6-18.8 GHz band to GSO FSS and systems with an apogee greater than 20,000 km.[165] Although footnotes limit non-Federal FSS use of the 18.6-18.8 GHz band on a primary basis to GSO networks, communications in this band in the space-to-Earth direction have been authorized for NGSO networks on an unprotected, non-harmful interference basis.[166]

62. *Comment Sought*. We seek comment on whether it is still necessary to limit use of the primary allocation for FSS (space-to-Earth) in the 18.6-18.8 GHz band to GSO networks. To what extent could the band be used more extensively for satellite communications if the limitations were modified or eliminated and NGSO FSS operations were permitted on a co-primary basis? If so, what sharing conditions should apply to use of the band by NGSO FSS systems?

63. We also seek comment on whether removing the limitation on the use of the allocation for FSS (space-to-Earth) to GSO networks could create harmful interference to other spectrum users in the band or in adjacent bands. For example, would removing the limitation on use of the 18.6-18.8 GHz band to GSO networks increase the risk of harmful interference to Federal and non-Federal operations in co-primary allocations for EESS (passive), and Space Research (passive)? Do the existing operations of NGSO networks in the band suggest that any risk of harmful interference could be mitigated without the need for the limitation of NG164? If so, what geographic or technical limitations could be adopted on NGSO operations in the 18.6-18.8 GHz band, either through a footnote to the U.S. Table or through changes to our rules governing satellite communications?

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[158] *Id*.

[159] *Id.* § 2.106(a).

[160] *Id.* § 2.106(d)(164).

[161] *Id.* § 2.106(d)(527A)(ii).

[162] 47 CFR § 2.106(c)(255) ("In addition to any other applicable limits, the power flux-density across the 200 MHz band 18.6-18.8 GHz produced at the surface of the Earth by emissions from a space station under assumed free-space propagation conditions shall not exceed −95 dB(W/m²) for all angles of arrival. This limit may be exceeded by up to 3 dB for no more than 5% of the time.").

[163] *Id.* § 2.106(a).

[164] *Id.* § 2.106(b)(516)(i).

[165] *Id.* § 2.106(b)(522)(i).

[166] *See SpaceX V3 Grant*, at 4 n.15.

64. We also seek comment on what technical limitations should be adopted to account for the current sharing environment between EESS (passive) and GSO FSS (s-E) in this band, as well as aggregate interference from potentially multiple non-GSO operators operating in both low-Earth and medium-Earth orbits? Given that EESS (passive) shares the 18.6-18.8 GHz band on a co-primary basis with existing GSO FSS (space-to-Earth (s-E)) operations, removing the limitation restricting FSS (s-E) use to GSO systems and permitting non-GSO use could increase the aggregate interference environment for EESS (passive). If harmful interference were observed, what mechanisms would be available to identify the source of the interference in such an environment?

2. 19.4-19.6 GHz

65. We seek comment on whether it is desirable and feasible to increase use of the 19.4-19.6 GHz band by removing the current restriction on the use of the band in the space-to-Earth direction to MSS feeder links.

66. *Allocations*. Internationally, the 19.3-19.7 GHz band, which encompasses the 19.4-19.6 GHz band, is allocated on a primary basis in all three ITU regions for Fixed, Mobile, and FSS (space-to-Earth) on a primary basis. Domestically, there is a primary allocation for Federal FSS (space-to-Earth) from 18.8 GHz to 20.2 GHz, and there is a primary non-Federal allocation for FS and FSS (space-to-Earth) in the 19.3-19.7 GHz band.[167] This non-Federal primary allocation for FSS (space-to-Earth) is subject to footnote NG166, which limits non-Federal FSS use of the 19.4-19.6 GHz band to feeder links for NGSO MSS.[168] Despite footnote NG166 limiting non-Federal FSS use of the 19.4-19.6 GHz band to feeder links for NGSO MSS, communications in this band in the space-to-Earth direction have been authorized for NGSO FSS operations on an unprotected, non-harmful interference basis.[169] The waiver grants are conditioned on the licensee not causing harmful interference to, and accepting harmful interference from, other authorized spectrum users, including the operation of MSS feeder links.

67. *Comment Sought*. We seek comment on whether it is possible to allow other FSS operations in the 19.4-19.6 GHz band without negatively affecting the spectrum use of MSS feeder links, and if so, whether restricting the use of the band to MSS feeder links through footnote NG164 still necessary. We also seek comment on whether removing the limitation on the use of the allocation for FSS (space-to-Earth) to feeder links for NGSO MSS could create harmful interference to other spectrum users in the band or in adjacent bands. For example, would removing the limitation on use of the 19.4-19.6 GHz band to feeder links for NGSO MSS increase the risk of harmful interference to Federal and non-Federal operations in co-primary allocations for Federal FSS (space-to-Earth) operations on a primary basis in the 18.8-20.2 GHz band? If so, what geographic or technical limitations could be adopted on NGSO operations in the 19.4-19.6 GHz band, either through a footnote added to the U.S. Table or through changes to our rules governing satellite communications, to protect other co-primary spectrum users?

3. 29.1-29.25 GHz

68. We seek comment on whether it is feasible and desirable to increase use of the 29.1-29.25 GHz band by removing the current limitation on the use of the band for FSS (Earth-to-space) to NGSO MSS feeder links.[170]

69. *Allocations*. Internationally, the 29.1-29.5 GHz band is allocated on a primary basis in all three ITU regions to Fixed, Mobile, and FSS (Earth-to-space). Domestically, there are no Federal

[167] 47 CFR § 2.106(a).

[168] *Id.* §§ 2.106(a), (d)(166).

[169] *See SpaceX V3 Grant*, at 6 n.26 &27.

[170] Under our rules, the FSS may include feeder links for other space radiocommunications services. 47 CFR § 25.103.

allocations anywhere in the 27.5-30.0 GHz band. There are non-Federal primary allocations in the 29.1-29.5 GHz band for Mobile, Fixed, and FSS (Earth-to-space). Footnote NG166, however, limits non-Federal FSS use of the 29.1-29.25 GHz band to feeder links for NGSO MSS.[171] Despite this limitation, communications in this band in the Earth-to-space direction have been authorized for NGSO FSS operations on an unprotected, non-harmful interference basis.[172]

70. *Comment Sought*. We seek comment on opening the FSS allocation in the 29.1-29.5 GHz band to operation beyond NGSO MSS feeder links, and consequent modification of footnote NG166, and how doing so might impact other in-band or adjacent-band operators. In particular, we observe that that Commission adopted the geographic restrictions on MSS feeder links contained in 1996 to protect the Local Multipoint Distribution Service (LMDS), which has co-primary status in the 29.1-29.25 GHz band.[173] At that time, the Commission decided that co-frequency sharing between GSO FSS or NGSO FSS ubiquitously deployed terminals and LMDS was generally not feasible.[174] The Commission permitted MSS feeder links in the 29.1-29.25 GHz band subject to a limited number of locations and geographic limitations.[175] We seek comment on whether any increased use of the 29.1-29.25 GHz band by satellite communications should include ubiquitously deployed terminals, or whether it should be limited to individually licensed earth stations. If we allow blanket licensing, would this raise any concerns with respect to co-frequency sharing between GSO FSS or NGSO FSS ubiquitously deployed terminals and LMDS and if so, what steps would be required to mitigate those concerns?

C. D-Band

71. We seek comment on the use of additional spectrum bands above 100 GHz for satellite communications. Specifically, we seek comment on adding a primary allocation in the non-Federal Table of the U.S. Table for FSS in the following select frequency bands:

- 122.25-148.5 GHz
- 151.5-164 GHz
- 167-174.8 GHz
- 191.8-200 GHz
- 209-226 GHz
- 231.5-250 GHz
- 252-300 GHz

72. These frequency bands, within the "D-band," are not currently extensively used for non-Federal operations and offer the opportunity to make a considerable amount of spectrum – 138.25 gigahertz – available to support satellite communications, which is more spectrum than is available in all spectrum below 100 GHz.[176] The 275-300 GHz band currently is not allocated for any

[171] 47 CFR § 2.106(d)(166).

[172] *See SpaceX V3 Grant*, at 6 n.26 & 27.

[173] *See Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5–29.5 GHz Frequency Band* et al., CC Docket No. 92-297, First Report and Order and Fourth Notice of Proposed Rulemaking, 11 FCC Rcd 19005 (1996) (*LMDS First Report and Order*); 47 CFR § 2.106(d)(166).

[174] *LMDS First Report and Order,* 11 FCC Rcdat 19015–16, para. 27.

[175] *Id.* at 19033, para. 70.

[176] These do not include any spectrum bands allocated for EESS (passive) or Space Research (passive) services. There are allocations in the U.S. Table for EESS (passive) and/or Space Research (passive) on a primary basis for

(continued….)

radiocommunication services.[177] These frequencies bands were considered for licensed and unlicensed operations as part of the Commission's Spectrum Horizons proceeding.[178]

73. *Allocations*. For the most part, the radiocommunication service allocations above 122 GHz are the same internationally and domestically, and the allocations in the Federal and non-Federal Tables of the U.S. Table are unified. There are two instances, however, where there are different allocations between the Federal and non-Federal Tables. In the 134-141 GHz bands and in the 241-250 GHz bands, there are allocations for Amateur and Amateur-satellite service, either on a primary or secondary basis, in the non-Federal table that do not exist in the Federal table.[179]

74. Within the specific bands that we are seeking comment on above, there are a handful of existing allocations in the U.S. Table for satellite communications in the FSS or MSS for Federal and non-Federal use. In the 123-130 GHz band, there is a primary allocation for FSS (space-to-Earth) and MSS (space-to-Earth). In the 158.5-164 GHz band, there are primary allocations for FSS (space-to-Earth) and MSS (space-to-Earth). In the 167-175.5 GHz band there is a primary allocation for FSS (space-to-Earth). In the 191.8-200 GHz band, there is a primary allocation for MSS, without a designation of direction. In the 209-217 GHz and 217-226 GHz bands, there are primary allocations for FSS (Earth-to-space). In the 232-235 GHz, 235-238 GHz and 238-240 GHz bands, there are primary allocations for FSS (space-to-Earth). In the 252-265 GHz band, there is a primary allocation for MSS (Earth-to-space), and in the 265-275 GHz band there is a primary allocation for FSS (Earth-to-space).[180]

75. *Comment Sought*. We seek comment on whether it would serve the public interest to take steps now to establish a foundation for increased use of the frequency bands above 122 GHz for satellite communications. In general, we seek comment on whether granting increased access to the D-band by satellite operators would advance our goal for more efficient and intensive use of spectrum. Specifically, we seek comment on whether to add a non-Federal allocation for FSS (Earth-to-space) in all the specific bands set forth in this section of the *Spectrum Abundance FNPRM*. Does the nature of millimeter band frequencies, with their small wavelengths and rapid signal loss, make it easier for satellite communications to share spectrum with other Federal and non-Federal operations without causing harmful interference or limiting deployments of other services to avoid interference to satellite communications?

76. We also seek comment on whether to the U.S. Table by making allocations for FSS in the 120-300 GHz band bi-directional; that is, specifying both the Earth-to-space and the space-to-Earth direction for every allocation for FSS. This would apply both to existing FSS allocations, and any new allocations for FSS above 120 GHz that we may adopt as a result of this *Spectrum Abundance FNPRM*. The high-gain, narrow "pencil thin" beams that are possible at millimeter wavelengths may facilitate the ability for both satellite communications uplinks and downlinks in the same geographic service area without causing harmful interference. We seek comment on this possibility.

(Continued from previous page)
Federal and non-Federal use in the following bands above 122 GHz: 148.5-151.5 GHz, 164-167 GHz, 174.8-182 GHz, 182-185 GHz, 185-190 GHz, 190-191.8 GHz, 200-209 GHz, 217-226 GHz, 226-231.5 GHz, 235-238 GHz, and 250-252 GHz. 47 CFR § 2.106(a).

[177] 47 CFR § 2.106(a).

[178] *Spectrum Horizons*, Notice of Proposed Rulemaking and Order, 33 FCC Rcd 2438 (2018) (*Spectrum Horizons NPRM*). The Commission adopted a framework for unlicensed operations in these frequency bands for experimental purposes in 2019. *Spectrum Horizons*, First Report and Order, 34 FCC Rcd 1605 (2019) (*Spectrum Horizons First R&O*). The Commission saved for future consideration proposals associated with licensed use of these frequency bands. *Id.* at 1606, para. 2.

[179] 47 CFR § 2.106(a).

[180] *Id*.

77. We also seek comment on whether any existing or new FSS allocations in the D-band should be limited to NGSO systems, or whether the FSS allocations should be permitted for use by both NGSO and GSO systems. We invite comment on whether any new FSS allocations in the D-band should be limited to individually licensed gateway and feeder link earth stations, or whether it is premature at this time to impose such a limitation. We seek comment on any changes to the U.S. Table to provide FSS allocations in the D-band, as well as any changes to our rules governing satellite communications to effectuate such changes.

78. Comments should address whether a "light licensing" approach, similar to the approach that was proposed for satellite communications in the W-bands, is appropriate and workable for use in the D-bands. We observe that the Commission proposed a "light licensing" approach for terrestrial FS systems in the *Spectrum Horizons NPRM*.[181] We seek comment on whether the use of frequency bands above 120 GHz for satellite communications is compatible with the proposals contained in the Spectrum Horizons proceeding to make frequencies above 95 GHz available for licensed use by FS using a light licensing approach. If not, should we take or further propose any actions in the Spectrum Horizons proceeding in light of any future decision to allocate additional frequencies above 95 GHz for satellite communications?

79. We also seek comment whether the Commission could adopt a two-track allocation framework, under which portions of the D-band that support services requiring heightened protection would be subject to the Commission's traditional allocation, licensing, and coordination processes. Other portions of the D-band could potentially be made available through a more flexible "light licensing" framework designed to support innovation, experimentation, and commercializing of emerging services and technologies. This "light licensing" framework could be based on the framework adopted for terrestrial FS operations in the Commission's 70/80/90 GHz proceeding.[182] We seek comment on this two-track framework and whether this framework could be applied to permit more intensive use of the D-band by satellite communications. We seek comment on what services should require heightened protection under a two-track framework and which portions of the D-band, if any, should be subject to heightened protection. Should such determinations be made by frequency range, service type, technical characteristics, geographic area, operating environment, or some combination of these factors?

80. We also seek comment whether there are any flexible frameworks suitable for the D-band besides "light licensing." For example, could licensees obtain immediate authority to operate in these bands via a "licensed by rule" framework that would provide necessary spectrum protections to services requiring heightened protection. If so, what protections would be necessary and what form should they take? We seek comment on what changes to the Commission's rules would be necessary to implement such protections. We also seek comment on an option to allocate all D-band frequencies, except those allocated for use by passive services, to a broad, generic category of operations covering any and all intentional radiators. Is the D-band, with its very high propagation losses, a candidate for experimenting with this novel spectrum access model? How would such a model complement, or differ from, the light licensing framework proposed for FS systems in the Commission's Spectrum Horizons NPRM discussed above? What innovations do commenters foresee? What changes to the Commission's rules might be required to manage or prevent harmful interference to existing spectrum users, including passive

[181] *Spectrum Horizons NPRM*, 33 FCC Rcd at 2452, paras. 28-29. Under this "light licensing" approach for FS systems, licensees first obtain a non-exclusive nationwide license from the Commission and then register individual point-to-point links with a third-party database manager. *Id.* at 2452, para. 29. Third-party database managers maintain a database of all registered links for the purposes of interference protection and establishing first in time rights. Id. Third-party database managers are also responsible for coordinating with NTIA through an automated "green light/yellow light" mechanism to avoid harmful interference to federal operations which share the spectrum. *Id.*

[182] *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 39 FCC Rcd 886 (2024).

operations?

81. Commenters should also address current Federal and non-Federal uses of the frequencies between 120 GHz and 300 GHz, opportunities for future satellite communications deployments, and potential co-existence measures to efficiently protect incumbent services or potential future services in these bands, particularly Federal operations. We expect that any coexistence analysis would consider specific information about anticipated space and earth station operating parameters, including deployment densities, earth station elevation angles, antenna characteristics, power levels, and out-of-band emissions. We also seek comment specifically on how increased use of the D-band frequencies is compatible with passive operations in this band. We also seek general information or methodologies that may best inform the likelihood of harmful interference.[183]

D. Inter-satellite Links

82. The use of inter-satellite links (ISLs) to transmit data between satellite systems in the space-to-space direction is becoming increasingly valued by industry actors. For example, the National Telecommunications and Information Administration (NTIA) and NASA jointly prepared a report encouraging allocation of the 18.1-18.6 GHz band for Intersatellite Service (ISS) use.[184] The Commission seeks comment on this proposal and on a number of additional proposals to facilitate the use of ISLs in order to make additional spectrum usable for satellite communications.

83. *Allocations*. The U.S. Table includes allocations for the non-Federal ISS in multiple frequency ranges.[185] However, the Commission has also received and granted multiple applications for ISL operations in additional bands on a case-specific basis, utilizing existing satellite networks that are authorized for operations in frequency bands allocated to MSS and FSS.[186] Interest in allocations for ISLs is also evident in the international frequency coordination process. ITU WRC-23 resulted in new allocations for ISLs in the 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands on the International Table of Frequency Allocations,[187] and WRC-27 includes an agenda item to consider additional frequency

[183] *See* International R.R., Resolution 712 (WRC-23) (revealing studies regarding the protection of Earth Exploration-Satellite service (passive) and the radio astronomy service in certain frequency bands above 76 GHz from unwanted emissions of active services).

[184] National Telecommunications and Information Administration, 18 GHz Band Report, NTIA Report 25-01, at 6 (2025), available at https://www.ntia.gov/report/2025/18-ghz-band-report. *See also The Space Bureau, the Wireless Telecommunications Bureau, the Office of International Affairs, and the Office of Engineering and Technology Seek Information on Sharing in the 18GHz Band in Connection with the National Spectrum Strategy Implementation Plan*, GN Docket No. 24-248, Public Notice, DA 24-815 (2024) (*18 GHz Public Notice*).

[185] 47 CFR § 2.206. The following frequencies are available for use by the non-Federal intersatellite service: 22.55-23.00 GHz, 23.00-23.55 GHz, 24.45-24.65 GHz, 24.65-24.75 GHz, 54.25-56.90 GHz, 57.00-58.20 GHz, and 65.00-71.00 GHz.

[186] *See, e.g.*, HawkEye 360, Inc., grant stamp, ICFS File No. SAT-MOD-SAT-MOD-20240619-00139 (granted May 30, 2025) (granted waiver request to receive and transmit inter-satellite signals from/to the Iridium satellite system in the 1618.725-1626.5 MHz frequency band on an unprotected, non-interference basis).

[187] *See* WRC-23 Final Acts, Resolution 679 (rel. Aug. 19, 2024); R.R. 5.521A ("For use of the frequency bands 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, or parts thereof, by space stations in the intersatellite service, Resolution 679 (WRC-23) shall apply. Such use is limited to space research, space operation and/or Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space. When using these frequencies, administrations shall ensure that this intersatellite service is used only for the aforementioned purposes and is not subject to coordination under No. 9.11A. For use of the frequency bands 18.1-18.6 GHz, 18.8-20.2 GHz, 27.5-29.1 GHz and 29.5-30 GHz by space stations, the allocation is limited to inter-satellite links between non-geostationary satellites or between non-geostationary satellites and geostationary satellites. For use of the frequency band 29.1-29.5 GHz by space stations, the allocation is limited to inter-satellite links between non-geostationary satellites and geostationary satellites. No. 4.10 does not apply").

bands for ISLs.[188]

84. *Comment Sought*. As an initial matter we propose to implement the WRC-23 outcome by adopting allocations for ISLs in the 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands. Additionally, we also seek comment on proposed licensing rules for these frequency bands. Throughout most of these bands, the FSS is allocated on a primary basis, and we seek comment on whether the ISS allocation should be on a primary basis too. We also seek comment on whether for the 18.1-18.142 GHz band, in which the FSS is currently allocated on a secondary basis with respect to the fixed service, the ISS allocation could be on a primary basis without meaningfully impacting the incumbent fixed service, given the substantial distances away from the surface of the Earth at which the satellite would receive signals. We also seek comment on necessary technical requirements for operations throughout all these bands, including whether we should incorporate the technical criteria of WRC-23 Resolution 679 by reference.[189] If the Commission does elect to adopt Resolution 679, should it do so in whole or in part? Should ISL operators be required to demonstrate compliance with Resolution 679 or to provide certification, particularly with respect to commitments required of administrations?[190]

85. We seek comment on what technical rules should be adopted for ISLs with the goal of providing a single rule provision that identifies technical requirements for their licensing and operation. We propose to add specific technical requirements governing ISL use in the following bands: 10.7-12.7 GHz and 14.0-14.5 GHz, the 1525-1544 MHz, 1545-1559 MHz 1626.5-1645.5 MHz, and 1646.5-1660.5 MHz, 27.5-29.2 GHz and 29.5-30 GHz and 18.1-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz bands, and 4000-4200 MHz and 6225-6424 MHz bands. Are there additional frequency bands that should be considered? What are the technical requirements necessary for interference-free operations? In general, the approach utilized for ISL use of non-allocated bands has been to provide the relay service to satellites at lower altitudes, with the end user satellite operating so that it closely emulates the technical parameters of an earth station operating with the relevant satellite network, particularly with respect to technical parameters that constrain effects on other systems and radio services. Are there specific technical requirements in addition to those in the proposed rule that, either generally for all bands or for specific bands, would permit operations without causing interference? We believe that a single technical rule provision could provide clarity for ISL use by licensed satellite systems in both allocated and non-allocated bands. We seek comment on how best to provide such clarity.

IV. FURTHER NOTICE OF PROPOSED RULEMAKING *(WSS FNPRM)*

86. In the *WSS NPRM*,[191] the Commission pursued two paths toward addressing spectrum needs for emergent space operations:[192] by clarifying and expanding traditional regulatory classifications so that emergent operations have more predictable spectrum access, and by exploring new spectrum bands that could be used to provide communications in support of emergent space operations.[193] This *WSS NPRM* seeks to build upon that second path rapidly by proposing and seeking comment on

[188] *See* WRC-27 Agenda Item 1.11, *available at* https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A0000110011PDFE.pdf.

[189] *See World Radiocommunication Conference 2023 (WRC-23) Final Acts*, Resolution 679 (rel. Aug. 19, 2024).

[190] Specific commitments are listed in items A.27.a, A.27.b, A.27.c, and A.27.f.1 of Appendix 4. (WRC-23), Final Acts, Resolution 679 (re. Aug. 19, 2024), *available at* https://www.itu.int/en/ITUR/space/support/Documents/RES679%20Website%20Content%20V2.pdf.

[191] *Spectrum Abundance for Weird Space Stuff*, SB Docket No. 26-54, Notice of Proposed Rulemaking, FCC 26-13 (rel. Mar. 27, 2026) (*WSS NPRM*).

[192] *WSS NPRM* at paras. 2-3. The Commission used the qualifier "emergent" and the phrase "emergent space operations" in the *WSS NPRM* to refer to spacecraft or commercial operations in space that use radio spectrum for the control of, or communications with, a spacecraft, but not for not satellite communications. *Id.*, n.5.

[193] *Id*. at para. 5.

additional spectrum bands that might be made available for communications in support of emergent space operations, beyond those that were the focus of the *WSS NPRM*.

87. In this *WSS Further Notice*, we broaden our consideration of additional frequency bands that could be made available for communications in support of emergent space operations to the following:[194]

- 2360-2395 MHz
- 13.25-13.4 GHz
- 100-300 GHz
- Bands used for inter-satellite links

88. We seek comment on the suitability of these bands for communications in support of emergent space operations, particularly whether there are equipment or antenna systems readily available for such communications. We also seek comment on any additional spectrum bands that could be made available for communications in support of emergent space operations in addition to, or as alternatives to, the bands discussed in this Further Notice. Commenters should address the existing usages of the proposed band and how the band could be used for communications in support of emergent space operations without causing interference to existing Federal and non-Federal spectrum users, either in the band or in adjacent bands. In all instances, we seek comment on any changes to the Commission's rules that may be needed to implement new or amended allocations for satellite communications in these bands, as well as any international considerations and impact on small businesses.

A. 2360-2395 MHz

89. We seek comment on whether the 2360-2390 MHz and the 2390-2395 MHz bands could be made available for use for TT&C in support of emergent space operations in a manner that avoids harmful interference to other spectrum users in the bands or in adjacent bands.

90. *Allocations*. The 2360-2390 MHz band is adjacent to the 2350-2360 MHz band that is licensed by AT&T to provide Wireless Communications Service (WCS) in most of the United States, and on which the Commission recently sought comment for possible leased use of spectrum for TT&C uplinks to emergent space operations.[195] Currently, the 2360-2390 MHz band has a primary allocation for mobile services for Federal and non-Federal users, which is limited to "aeronautical telemetering and associated telecommand operations for the flight testing of aircraft, missiles, or major components thereof" pursuant to footnote US276 to the U.S. Table.[196] There is an allocation on a secondary basis for mobile services (except aeronautical mobile) through footnote US101 to the U.S. Table, which is limited to medical radio (MedRadio) operations, which are authorized in the Commission's rules under part 95.[197] In the Federal table, there are also allocations for radiolocation on a primary basis and FS on a secondary basis.

91. The 2390-2395 MHz band also has the same secondary allocation for non-Federal SOS (Earth-to-space) and (space-to-Earth) as the 2360-2390 MHz band.[198] Like the 2360-2390 MHz band, the

[194] These spectrum bands include bands that may be used intensively by non-Federal spectrum users in certain geographic areas, but that may not be used in other geographic areas, and that either are not shared with Federal users, or that are shared with, but not used intensively by Federal users and are allocated on a secondary basis for Federal users.

[195] *Id*. at paras. 71-84.

[196] 47 CFR §§ 2.106(a), (c)(276).

[197] *Id.* § 95.1 *et seq*.; 47 CFR §§ 2.101(a), (c)(101).

[198] *Id.* § 2.106(a).

2390-2395 MHz band also has primary allocations for Federal Mobile service, subject to footnote US276. Unlike the 2360-2390 MHz band, the 2390-2395 MHz band has a non-Federal primary allocation for the Amateur service. The adjacent 2395-2400 MHz band also has a primary allocation for the non-Federal Amateur service.

92. Internationally, the 2360-2390 MHz band is contained within the 2300-2450 MHz band that is allocated in all ITU regions on a primary basis for Fixed and Mobile Services, and on a secondary basis for Amateur service. In ITU Regions 2 and 3, there is an allocation for Radiolocation services on a primary basis, but in ITU Region 1 the allocation for Radiolocation services is on a secondary basis.

93. *Launch Frequencies*. Recently, the Commission has also authorized use of certain frequencies within the 2360-2390 MHz band – 2364.5 MHz, 2370.5 MHz, and 2382.5 MHz – for sharing on a co-equal basis by Federal and non-Federal stations for Space Operations in both the Earth-to-space and space-to-Earth directions, on a secondary basis, for launch vehicle telemetry and commands.[199] These launch frequencies are subject to part 26 of the Commission's rules,[200] as well as footnote NG42, which requires that Space Operations transmissions be restricted to pre-launch testing and space launch operations, that non-Federal stations shall not cause harmful interference to stations of primary services, and that Space Operations are subject to coordination with NTIA prior to each launch.[201]

94. *Aeronautical Mobile Telemetry Use*. The Aerospace and Flight Test Radio Coordinating Council, Inc. (AFTRCC) has been designated by the Commission to coordinate use of the 2360-2390 MHz band for non-Federal aeronautical mobile telemetry (AMT) uses.[202] AFTRCC collaborates with frequency coordinators of the Department of Defense (DoD) and with DoD test ranges to protect operations at hundreds of Federal and non-Federal AMT receive sites throughout the United States.[203] It also coordinates WCS base stations operating in the 2345-2360 MHz band to protect AMT operations in the 2360-2395 MHz band from harmful interference that may be caused by WCS base station operations.[204] In a letter filed prior to the adoption of the WSS NPRM, AFTRCC expressed that it was glad to see that the 2360-2395 MHz band was not being considered for use for communications in support of emergent space operations, particularly in light of the incipient implementation of commercial space launch operations under part 26 that add complexity to coordination in the band.[205]

95. *Comment Sought*. While we recognize the existing challenges in coordinating Federal and non-Federal operations in this band to protect AMT used in support of flight testing, we seek to explore whether the 2360-2390 MHz band could accommodate communications in support of emergent space operations in a manner that compliments, and does not interfere with, existing use of the band by Federal and non-Federal spectrum users. Specifically, we seek comment on whether to add a footnote, or to modify an existing footnote, to the U.S. Table in the 2360-2390 MHz and 2390-2395 MHz bands to permit communications with spacecraft that are not communications satellites as part of the primary allocation for SOS in the non-Federal table. We also seek comment on whether such communications should be permitted in the Earth-to-space direction, the space-to-Earth direction, or both.

96. We also ask whether requiring geographic separation of earth stations used in support of

[199] *Id.* § 2.106(a), (c)(276); *see also Allocation of Spectrum for Non-Federal Space Launch Operations*, Third Report and Order, 39 FCC Rcd 14065 (2024), *pet. for recon. pending*.

[200] 47 CFR § 26.1 *et seq.*

[201] *Id.* § 2.106(a), (d)(42)

[202] Letter from Kara R. Curtis, President, AFTRCC, to Marlene H. Dortch, Secretary, FCC, dated Mar. 19, 2026 (AFTRCC March 19, 2026, *Ex Parte*) at 1.

[203] *Id.*

[204] *Id*.

[205] *Id*. at 2.

emergent space operations from AMT receive sites could facilitate coordination of such earth stations with Federal and non-Federal AMT operations. Does the nature of communications with space stations in orbit, rather than with launch vehicles, provide more flexibility in the location of earth stations used in support of emergent space operations than for stations used to support launch operations? If so, could such earth stations be required to be located a certain distance from AMT receive sites and/or be required to coordinate through AFTRCC to avoid interference to AMT operations? If so, we seek comment on what distances would be sufficient and whether coordination through AFTRCC is feasible. Alternatively, is it possible to establish transmit power levels for earth station uplinks, or power flux density limits on space station downlinks, in the 2360-2390 MHz band that would not cause interference to AMT operations and would not require coordination? Are there any other technical limits or operating parameters that could be applied to such earth or space station operations that would prevent interference to Federal and non-Federal AMT operations and reduce or eliminate the challenges of coordination?

97. We also seek comment on the potential impact on space launch operations if the 2360-2390 MHz band was permitted for use for communications in support of emergent space communications. Are there any restrictions or limitations on such communications that would prevent interference to space launch operations and reduce or eliminate the challenges of coordination? Would these technical limits or operating parameters prevent interference to WCS operations in the adjacent 2350-2360 MHz band? If not, would limiting operations in the 2360-2390 MHz band to TT&C downlinks at power levels similar to those used for Satellite Digital Audio Radio Service (SDARS) in the 2320-2345 MHz band be practical to avoid interference to AMT receive sites in the 2360-2390 MHz band and to WCS operations in the adjacent 2350-2360 MHz band?[206] Are there international recommendations, such as ITU Recommendation M.1459, that could be used as guidance for developing technical limits or operating parameters to prevent harmful interference to other users of the 2360-2390 MHz band?[207]

98. We also seek comment on what geographic restrictions, coordination requirements, or technical limits would be necessary to protect other spectrum users in the 2360-2390 MHz or adjacent bands besides AMT, space launch services, or WCS. For example, would expanding the use of the existing SOS secondary allocation in the 2360-2390 MHz band to include TT&C communications in support of emergent space operations in the 2360-2390 MHz band have the potential to cause interference to primary status Federal radiolocation services or to non-Federal MedRadio operations under part 95 of our rules? If so, what additional measures could be adopted to mitigate or eliminate the risk of harmful interference to radiolocation, MedRadio, or other radiocommunication services if the existing SOS secondary allocation in the 2360-2390 MHz band is expanded to include TT&C communications in support of emergent space operations?

99. We also seek comment on whether the 2390-2395 MHz band, which also has a secondary allocation for non-Federal SOS (Earth-to-space) and (space-to-Earth), could be used for communications with emergent space operations. We seek comment on how expanding the use of the secondary SOS non-Federal allocation in either the 2360-2390 MHz or 2390-2395 MHz band to include TT&C communications in support of emergent space operations could be accomplished without causing harmful interference to Amateur service in the 2390-2395 MHz or 2395-2400 MHz bands. Given that Amateur service operations can be performed anywhere by a range of individuals, would geographic restrictions,

[206] The maximum SDARS pfd level for any angle of arrival of -119 dB(W/m2/4 kHz) in the 2320-2345 MHz band. is incorporated into the bilateral agreement between the United States and Canada regarding SDARS in the United States in the 2320-2345 MHz band. Agreement Concerning the Coordination between U.S. Satellite Digital Audio Radio Service and Canadian Fixed Service and Mobile Aeronautical Telemetry Service in the band 2320-2345 MHz at 8 (Aug. 1998), *available at* https://transition.fcc.gov/bureaus/ib/sand/agree/files/can-bc/can-dars.pdf.

[207] Recommendation ITU-R M.1459, Protection criteria for telemetry systems in the aeronautical mobile service and mitigation techniques to facilitate sharing with geostationary broadcasting-satellite and mobile-satellite services in the frequency bands 1 452-1 525 GHz and 2 130-2 360 MHz (May 2000).

coordination requirements, or technical limits placed on such TT&C communications in the 2360-2395 MHz to protect other spectrum users also protect the Amateur service in the 2390-2395 MHz and 2395-2400 MHz bands? If not, are there additional measures that could be adopted to protect the Amateur service?

B. 13.25-13.4 GHz

100. We seek comment on whether the 13.25-13.4 GHz bands could be used for communications in support of emergent space operations, limited to space research and In-Space Servicing, Assembly, and Manufacturing (ISAM) uses.

101. *Allocations*. The 13.25-13.4 GHz band has primary allocations for Federal and non-Federal Aeronautical Radionavigation, subject to footnote 5.497 of the U.S. Table that limits the use to Doppler navigation aids.[208] The U.S. Table also provides allocations for the EESS (active) and the SRS (active), although these allocations differ in that they are allocated on a primary basis for Federal operations and on a secondary basis for non-Federal operations. In both instances, footnote 5.498A to the U.S. Table provides that EESS and SRS operating in the 13.25-13.4 GHz band shall not cause harmful interference to, or constrain the use and development of, the aeronautical radionavigation service.[209] Internationally, there are primary allocations for aeronautical radionavigation, EESS (active), and SRS (active), also subject to footnote 5.498A.[210]

102. *Comment Sought*. We seek comment on whether to add an allocation for SRS and/or SOS to the non-Federal Table in the 13.25-13.4 GHz band in the space-to-Earth direction to be used for TT&C or for relaying data in support of emergent space operations. The Commission has previously recognized that service allocations for narrowband TT&C may not be sufficient for certain operators, such as those conducting RPO and docking, or those operating inhabitable spacecraft.[211] We seek comment whether the 13.25-13.4 GHz band could be used for those larger data transmissions, by allowing them to be provided as SRS in support of research, scientific, or earth exploration or as SOS for TT&C in support of ISAM missions in the event the Commission decides to interpret the definitions of space telecommand and space telemetry to include downlink of video and other data during maneuvers such as RPO or docking with other spacecraft.[212]

103. We seek comment on whether an allocation for SRS or SOS in the 13.25-13.4 GHz band in the non-Federal Table should be made on a primary or secondary basis. We also seek comment on whether limitations are necessary on the number of space stations in a system using the 13.25-13.4 GHz band in order to facilitate use with existing users of the band. Is the allocation to SRS or to SOS in support of ISAM operations sufficient to avoid use by large numbers of space stations that could increase the risk of interference with existing users of the band? How should any allocation be worded in order to effectuate an intent that the allocation not be used for large constellations of space stations?

C. 100 GHz and above

104. We seek comment on whether frequencies above 100 GHz could be used for communications in support of emergent space operations, which has been proposed on the record.[213]

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[208] 47 CFR § 2.106(b)(497).

[209] *Id.* § 2.106(b)(498).

[210] *See also* 47 CFR § 2.106(b)(499).

[211] *WSS NPRM* at para. 34 (*citing ISAM NPRM*, 39 FCC Rcd at 1878-80, para. 33).

[212] *Id*. at para. 34.

[213] *Id*. at para. 40, n.81, citing Letter from Michael J. Marcus, Director, Marcus Spectrum Solution LLC, to Marlene H. Dortch, Secretary, FCC (dated Mar. 17, 2026) (referencing filing made on May 16, 2026 proposing consideration of spectrum bands above 100 GHz for emergent space operations).

Proponents of this proposal state that the propagation characteristics of frequencies above 100 GHz allow novel sharing approaches with other spectrum users, particularly terrestrial systems.[214] They contend that millimeter or submillimeter wavelengths may also permit antenna designs that are not practical at larger wavelengths.[215] Proponents acknowledge the need to protect passive scientific use for environmental sensing and radio astronomy above 100 GHz,[216] but state that geographic separation from passive facilities may avoid interference to passive operations.[217]

105. *Comment Sought*. In the *Spectrum Abundance NPRM*, the Commission proposed allocations for FSS (Earth-to-space) on a primary basis in segments of the W-band: 92.0-94.0 GHz; 94.1-100 GHz; 102-109.5 GHz; 111.8.-114.25 GHz.[218] We seek comment on whether these bands, and other bands above 100 GHz, could be used in support of emergent space operations. Comments should identify specific bands, mindful of the presence of numerous allocations for passive operations above 100 GHz. Do the propagation characteristics and shorter wavelengths above 100 GHz facilitate or constrain the use of millimeter and submillimeter bands to support emergent space operations? Does the amount of potential spectrum that could be made available to support communications for emergent space operations in bands above 100 GHz offset the absence of off-the-shelf antenna systems in these bands?[219] How would use of bands above 100 GHz be able to operate without causing harmful interference to other spectrum users, either Federal or non-Federal? In particular, how would Federal operations in these bands be protected?

106. We also seek comment on the specifics of making spectrum above 100 GHz available for communications in support of emergent space operations. For example, is it preferable to implement such availability through an allocation for SOS in these bands, and if so, should the allocation be on a primary or secondary basis? Alternatively, could availability be made through a footnote to the U.S. Table that permitted non-passive bands above 100 GHz also to be used for SOS in support of emergent space operations? Should the use of spectrum above 100 GHz for communications with emergent space operations be limited to the Earth-to-space direction, or is it feasible to permit communications in the space-to-Earth direction as an alternative to, or in conjunction with, Earth-to-space communications? We also seek comment on whether the use of frequency bands above 100 GHz for communications in support of emergent space operations is compatible with the proposals contained in the Spectrum Horizons proceeding to make frequencies above 95 GHz available for licensed use by FS and MS using a light licensing approach.[220] If not, should we take or further propose any actions in the Spectrum Horizons proceeding in light of any future decision in the Spectrum Abundance for Weird Space Stuff proceeding to allocate frequencies above 100 GHz for communications in support of emergent space operations?

107. We also seek comment regarding the amount of spectrum above 100 GHz that would be necessary to meet the anticipated operational requirements for space operations, including the density of those operations. What additional spectrum or capabilities would frequencies above 100 GHz provide that are not available under existing spectrum allocations? Given the constraints on potential space operations above 100 GHz, including greater atmospheric absorption and attenuation due to rain, clouds, and water

[214] Josep Jornet, Michael Marcus, John O'Hara, and Vubiq Networks, Inc. Comments (filed Mar. 16, 2026) (*Jornet/Marcus Comments*).

[215] *Id*. at 5.

[216] *Id*. at 5. Large amounts of spectrum above 100 GHz are subject to ITU Radio Regulation 5.340 (RR 5.340), which prohibits emissions in bands allocated for passive services.

[217] *Id*. at 5-6.

[218] *Spectrum Abundance NPRM* at paras. 60-63.

[219] Jornet/Marcus Comments at 5 (observing that there is as much spectrum available in the 100-200 GHz range as currently being used for all existing radiocommunication services).

[220] *Spectrum Horizons NPRM*, 33 FCC Rcd at 2452, paras. 28-29.

vapor, and limited deployment of current antenna systems above 100 GHz, we seek clarification on the technical capabilities/antenna performance required to support reliable space operations at these frequencies. We also seek clarification on the performance requirements for such space operations and how those requirements can be achieved while protecting current Federal operations, including in bands with a primary allocation for EESS (passive) and radio astronomy.

D. Inter-satellite Links

108. In the *WSS NPRM*, the Commission sought comment on allowing space stations already licensed by the Commission to use inter-satellite links to provide TT&C and payload data downlinks and uplinks to and from spacecraft that do not otherwise provide radiocommunication services.[221] The Commission also asked whether it should limit or identify the specific frequency bands in which inter-satellite links may be used in connection with spacecraft that do not otherwise provide radiocommunication service.[222] In the *Spectrum Abundance FNPRM* above, we propose to implement decisions made at WRC-23 by adopting allocations for intersatellite service in the 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands. We seek comment on whether these frequency bands would be suitable to provide TT&C and data downlinks and uplinks in support of emergent space operations. Is it technically and economically feasible for emergent space operations to utilize a future allocation for intersatellite service in these bands? Does the potential use of these bands for inter-satellite links in support of emergent space operations support the adoption of an allocation for intersatellite service in the 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands?

109. In addition, the *Spectrum Abundance FNPRM* proposed to add specific technical requirements governing the use of inter-satellite links in the following bands: 10.7-12.7 GHz and 14.0-14.5 GHz, the 1525-1544 MHz, 1545-1559 MHz 1626.5-1645.5 MHz, and 1646.5-1660.5 MHz, 27.5-29.2 GHz and 29.5-30 GHz and 18.1-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz bands, and 4000-4200 MHz and 6225-6424 MHz bands.[223] We seek comment on whether these proposed technical rules are sufficient to support use of the bands for inter-satellite links in support of emergent space operations, or whether any changes to the proposed rules are needed to account for the specific operational requirements of emergent space operations.

110. We also seek comment on the increasing availability and use of free-space optical, or laser, inter-satellite links. To what extent could optical inter-satellite links serve as an alternative to, or complement for, radiofrequency links—particularly for high-data-rate payload communications—and thereby reduce the need for additional spectrum allocations? Should the Commission encourage the use of optical inter-satellite links where technically and economically feasible before allocating additional spectrum for comparable radiofrequency operations?

V. PROCEDURAL MATTERS

111. *Comment Filing Procedures*. 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.

[221] *WSS NPRM* at para. 86.

[222] *Id.* at para. 87.

[223] *See supra*, paras. 83-86.

- 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.

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

113. *Availability of Documents*. Comments, reply comments, and *ex parte* submissions will be publicly available online via ECFS. Documents will be available electronically in ASCII, Microsoft Word, and/or Adobe Acrobat.

114. *Ex Parte Presentations—Permit-but-Disclose.* This proceeding shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[224] 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 consistent 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.

115. *Regulatory Flexibility Act.* The Regulatory Flexibility Act of 1980, as amended (RFA),[225] requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."[226] Accordingly, the Commission has

[224] 47 CFR § 1.1200 *et seq*.

[225] 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601-612, was amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[226] 5 U.S.C. § 605(b).

prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule and policy changes contained in this Notice on small entities. The FRFA is set forth in [Appendix D.]

116. The Commission has also prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning the potential impact of rule and policy change proposals on small entities in the *Spectrum Abundance FNPRM* and the *WSS FNPRM.* The IRFA for each of these further notices is set forth in [Appendix E and Appendix F.] The Commission invites the general public, in particular small businesses, to comment on the IRFA for each of these further notices. Comments must be filed by the deadlines for comments indicated on the first page of this document and must have a separate and distinct heading designating them as responses to the IRFA for the *Spectrum Abundance FNRPM* or the *WSS FNPRM*.

117. *Paperwork Reduction Act Analysis.* The Order contains modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, other Federal agencies, and the general public are invited to comment on the modified information collection requirements contained in this document. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. § 3506(c)(4), we previously sought specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

118. In this Order, we have assessed the effects of revising our space and earth station licensing rules and find that they will have a small impact on small business concerns. Due to the significant costs involved in earth station and space station development and deployment, we anticipate that few entities impacted by this rulemaking would qualify as small businesses.

119. Additionally, the Order may contain non-substantive modifications to approved information collections. Any such modifications will be submitted to OMB for review pursuant to OMB's non-substantive modification process.

120. The *FNPRMs* may contain new or proposed 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 2002, 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.

121. *Congressional Review Act.* The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs that this rule is "major" under the Congressional Review Act, 5 U.S.C. § 804(2). The Commission will send a copy of this Report and Order and Order of Proposed Modification to Congress and the Government Accountability Office pursuant to the Congressional Review Act, see 5 U.S.C. § 801(a)(1)(A).

122. *OPEN Government Data Act*. The OPEN Government Data Act[227] requires agencies to make "public data assets" available under an open license and as "open Government data assets," i.e., in machine readable, open format, unencumbered by use restrictions other than intellectual property rights, and based on an open standard that is maintained by a standards organization.[228] This requirement is to be implemented "in accordance with guidance by the Director" of the OMB.[229] The term "public data

[227] Congress enacted the OPEN Government Data Act as Title II of the Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. No. 115-435 (2019), §§ 201-202.

[228] 44 U.S.C. §§ 3502(20), (22) (definitions of "open Government data asset" and "public data asset"), 3506(b)(6)(B) (public availability).

[229] OMB has not yet issued final guidance.

asset" means "a data asset, or part thereof, maintained by the Federal government that has been, or may be, released to the public, including any data asset, or part thereof, subject to disclosure under the Freedom of Information Act (FOIA)."[230] A "data asset" is "a collection of data elements or data sets that may be grouped together,"[231] and "data" is "recorded information, regardless of form or the media on which the data is recorded."[232]

123. *Providing Accountability Through Transparency Act*. The Providing Accountability Through Transparency Act requires each agency, in providing notice of a rulemaking, to post online a brief plain-language summary of the proposed rule.[233] Accordingly, the Commission will publish the required summary of the Further Notices of Proposed Rulemaking on https://www.fcc.gov/proposed-rulemakings.

124. *Additional Information*. For additional information on this proceeding, contact Stephen Duall, Deputy Chief, Space Bureau, at stephen.duall@fcc.gov or 202-418-1103 or Renae Stong, Attorney Advisor, Satellite Programs and Policy Division, Space Bureau, at renae.stong@fcc.gov or 202-418-2952.

VI. ORDERING CLAUSES

125. Accordingly, IT IS ORDERED that, pursuant to the authority found in sections 1, 4(i), 157, 301, 303, 307, 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 157, 301, 303, 307, 308, 309, and 310, that this *Report and Order and Order of Proposed Modification* in GN Docket No. 22-352, WT Docket No. 23-158, GN Docket No. 14-177, and SB Docket No, 25-180, *Further Notice of Proposed Rulemaking* in SB Docket No. 25-180, and *Further Notice of Proposed Rulemaking* in SB Docket No. 26-54 ARE HEREBY ADOPTED.[234]

126. IT IS FURTHER ORDERED that this *Report and Order and Order of Proposed Modification* in SB Docket No. 25-180, GN Docket No. 22-352, WT Docket No. 23-158, and GN Docket No. 14-177 SHALL BE EFFECTIVE 60 days after publication in the Federal Register, with the exception of revisions to sections 100.212(c), 100.212(i), 100.212(j), 100.275(n), and 100.275(o), which may contain new or modified information collection requirements and will not be effective until after the Office of Management and Budget completes any review the Space Bureau determines is required under the Paperwork Reduction Act and provide an effective date by subsequent Public Notice.

127. IT IS FURTHER ORDERED that if no petitions for reconsideration or applications for review of the *Report and Order and Order of Proposed Modification* are timely filed, the proceedings in GN Docket No. 22-352 and WT Docket No. 23-158 shall be TERMINATED and the dockets will be CLOSED.

128. IT IS FURTHER ORDERED that, pursuant to Section 309 and 316 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 309 and 316, in the *Order of Proposed Modification* (*Order*) the Commission proposes that the licenses and authorizations of all Fixed Service and Mobile Service licensees in the 12.7-13.25 GHz band will be modified to a secondary status pursuant as specified in this *Spectrum Abundance R&O* at paragraphs 28-30, these modification will be effective 10 years from the date of publication of this *Spectrum Abundance R&O and Order* in the *Federal Register*, provided, however, that in the event any Fixed Service or Mobile Service licensee who believes

[230] 44 U.S.C. § 3502(22).

[231] 44 U.S.C. § 3502(17).

[232] 44 U.S.C. § 3502(16).

[233] 5 U.S.C. § 553(b)(4). The Providing Accountability Through Transparency Act, Pub. L. No. 118-9 (2023), amended section 553(b) of the Administrative Procedure Act.

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

that its license would be modified by this proposed action, seeks to protect this proposed modification and its accompanying timetable, the proposed license modification specified in the *Spectrum Abundance R&O and Order* and contested by the licensee shall not be made final as to such licensee unless and until the Commission orders otherwise. Pursuant to Section 316(a)(1) of the Communications Act of 1934, as amended, 47 U.S.C. § 316(a)(1), publication of the *Spectrum Abundance R&O* in the *Federal Register* shall constitute notification in writing of our *Order* proposing modification of the 12.7-13.25 GHz Fixed Service and Mobile Service licenses and of the grounds and reasons therefore, and those licensees and any other party seeking to file a protest pursuant to Section 316 shall have 30 days from the date of such publication to protest such *Order*.

129. IT IS FURTHER ORDERED, pursuant to Section 309 and 316 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 309 and 316, that following the final modification of each Fixed Service and Mobile Service license, the Wireless Telecommunications Bureau shall further modify such licenses as necessary in order to implement the specific modification in the manner specified in the *Spectrum Abundance R&O*.

130. IT IS FURTHER ORDERED that the Office of the Secretary, SHALL SEND a copy of the *Spectrum Abundance R&O and Order of Proposed Modification* in GN Docket No. 22-352, WT Docket No. 23-158, GN Docket No. 14-177, and SB Docket No, 25-180, *Further Notice of Proposed Rulemaking* in SB Docket No. 25-180, and *Further Notice of Proposed Rulemaking* in SB Docket No. 26-54, including the Final Regulatory Flexibility Analysis and Initial Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration, in accordance with section 603(a) of the Regulatory Flexibility Act.

131. IT IS FURTHER ORDERED that the Office of the Managing Director, Performance Program Management, SHALL SEND a copy of the *Spectrum Abundance R&O* and *Order of Proposed Modification* in GN Docket No. 22-352, WT Docket No. 23-158, GN Docket No. 14-177, and SB Docket No, 25-180 in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act.[235]

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

[235] *See* 47 CFR § 801(a)(1)(A).

APPENDIX A
List of Commenters

12.7 GHz Band NPRM (GN Docket No. 22-352)

Comments

5G Americas

5G for 12 GHz Coalition

Aderant

AT&T Services, Inc.

Competitive Carriers Association

Computer & Communications Industry Association

Comsearch, a CommScope Company

CTIA

DIRECTV, LLC

DISH Network Corporation

Dynamic Spectrum Alliance

Ericsson

Go Long Wireless, LLC

INCOMPAS

Intelsat License LLC, SES Americom, Inc., Hispasat, S.A., Eutelsat S.A., Ovzon LLC

Monisha Ghosh

National Association of Broadcasters

National Telecommunications and Information Administration

NCTA - The Internet & Television Association

Nokia

OneWeb

Public Interest Organizations

Qualcomm Incorporated

RS Access, LLC

Samsung Electronics America, Inc.

Satellite Industry Association

Space Exploration Holdings, LLC

The Society of Broadcast Engineers, Inc.

T-Mobile USA, Inc.

Verizon

WISPA - Broadband Without Boundaries

Reply Comments

5G for 12 GHz Coalition

AT&T Services, Inc.

CTIA

DIRECTV, LLC

DISH Network Corporation

Dynamic Spectrum Alliance - DSA

INCOMPAS

Intelsat License LLC, SES Americom, Inc., Hispasat, S.A., Eutelsat S.A., Ovzon LLC

National Association of Broadcasters

NCTA - The Internet & Television Association

OneWeb

Public Knowledge, New America's Open Technology Institute

Space Exploration Holdings, LLC

The Digital Progress Institute

The Society of Broadcast Engineers, Inc.

T-Mobile USA, Inc.

Verizon

WISPA - Broadband Without Boundaries

***Ex Parte* Filers**

5G for 12 GHz Coalition

DIRECTV, LLC

DISH Network Corporation

Intelsat License LLC

Intelsat License LLC, SES Americom, Inc., Hispasat, S.A., Eutelsat S.A., Ovzon LLC

NCTA - The Internet & Television Association

42 GHz Band NPRM (WT Docket No. 23-158; GN Docket No. 14-177)

Comments

Charter Communications, Inc.

Comsearch, a CommScope company

CORF - National Academy of Sciences

Dynamic Spectrum Alliance - DSA

Federated Wireless, Inc.

Kuiper Systems LLC

NCTA - The Internet & Television Association

Open Technology Institute at New America, Public Knowledge

Qualcomm Incorporated

T-Mobile USA, Inc.

WISPA - Broadband Without Boundaries

Reply Comments

Dynamic Spectrum Alliance, DSA

Federated Wireless, Inc.

INCOMPAS

NCTA - The Internet & Television Association

Open Technology Institute at New America, Public Knowledge

Starry, Inc.

WISPA - Broadband Without Boundaries

***Ex Parte* Filers**

NCTA - The Internet & Television Association

Open Technology Institute at New America

Qualcomm Incorporated

Spectrum Abundance NPRM (GN Docket No. 22-352; WT Docket No. 23-158; GN Docket No. 14-177)

Comments

Albin J. Gasiewski

American Astronomical Society

American Geophysical Union, American Meteorological Society, National Weather Association, University Corporation for Atmospheric Research

AST & Science, LLC

Commercial Space Federation

Computer & Communications Industry Association (CCIA)

Comsearch

CORF - National Academy of Sciences

CTIA

Digital Liberty

DIRECTV, LLC

Environmental Health Trust

Eutelsat S.A., Hispasat, S.A., Ozvon LLC, SES S.A. (SES et al.)

IEEE Geoscience and Remote Sensing Society

Kuiper Systems LLC

Logos Space Services, Inc.

Michael Ravnitzky

mmWave Coalition

National Radio Astronomy Observatory (NRAO)

Open Technology Institute at New America, Public Knowledge (OTI/PK)

Paolo de Matthaeis

Satellite Industry Association (SIA)

Space Exploration Holdings, LLC (SpaceX)

Wired Broadband, Inc. et al.

Reply Comments

American Astronomical Society

CTIA

Eutelsat S.A., Hispasat, S.A., Ozvon LLC, SES S.A.

American Geophysical Union, American Meteorological Society, National Weather Association, University Corporation for Atmospheric Research

IEEE GRSS

Kuiper Systems LLC

Logos Space Services, Inc.

Marcus Spectrum Solutions LLC

Micronet Communications, Inc.

Moog Inc.

Space Exploration Holdings, LLC

The Association for Broadband Without Boundaries

***Ex Parte* Filers**

Computer & Communications Industry Association

Comsearch

Open Technology Institute at New America

Ovzon LLC

Satellite Industry Association

Space Exploration Holdings, LLC

The Tomorrow Companies Inc.

APPENDIX B

Final Rule Changes

For the reasons discussed in the document above, the Federal Communications Commission amends 47 CFR parts 2 and 100 as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Amend § 2.106(a) by

a. Revising pages 49 and 59 of the Allocation Table to read as follows

3. Amend § 2.106(d) by

b. Revising paragraph (d)(52);

c. Revising paragraph (d)(53);

d. Deleting and reserving paragraph (d)(57);

e. Revising paragraph (d)(144);

f. Reserving paragraphs (d)(145) and (146)

g. Revising paragraph (d)(150);

h. Reserving paragraph (d)(151); and

i. Revising paragraph (d)527A.

The revisions and additions read as follows:

§ 2.106 Table of Frequency Allocations.

(a) * * *

* * * * *

Table of Frequency Allocations — 11.7-14.47 GHz (SHF) — Page 49

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
11.2-11.45 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 (Earth-to-space) 5.484 MOBILE except aeronautical mobile	11.2-11.45 FIXED FIXED-SATELLITE (space-to-Earth) 5.441 MOBILE except aeronautical mobile		(See previous page)		
11.45-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.484 MOBILE except aeronautical mobile	11.45-11.7 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile				
11.7-12.5 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492	11.7-12.1 FIXED 5.486 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.488 Mobile except aeronautical mobile 5.485	11.7-12.2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492	11.7-12.2	11.7-12.2 FIXED-SATELLITE (space-to-Earth) 5.485 5.488 NG143 NG527A	Satellite Communications (25)
	12.1-12.2 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.488 5.485 5.489	5.487 5.487A			
5.487 5.487A	12.2-12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE 5.492 5.487A 5.488 5.490	12.2-12.5 FIXED FIXED-SATELLITE (space-to-Earth) 5.484B MOBILE except aeronautical mobile BROADCASTING 5.484A 5.487	12.2-12.75	12.2-12.7 FIXED BROADCASTING-SATELLITE 5.487A 5.488 5.490	Satellite Communications (25) Fixed Microwave (101)
12.5-12.75 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.494 5.495 5.496	12.7-12.75 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile	12.5-12.75 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B MOBILE except aeronautical mobile BROADCASTING-SATELLITE 5.493		12.7-12.75 Fixed NG118 FIXED-SATELLITE (Earth-to-space) Mobile NG144	TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
12.75-13.25 FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)			12.75-13.25 US251	12.75-13.25 Fixed NG118 FIXED-SATELLITE (Earth-to-space) 5.441 NG52 Mobile US251 NG53 NG144	Satellite Communicatior (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
13.25-13.4 EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active)			13.25-13.4 EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497	13.25-13.4 AERONAUTICAL RADIONAVIGATION 5.497 Earth exploration-satellite (active) Space research (active)	Aviation (87)

5.498A 5.499	SPACE RESEARCH (active) 5.498A		

* * * * *

Table of Frequency Allocations			42-56.9 GHz (EHF)		Page 59
International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
41-42.5 GHz: see previous page			41-42.5 GHz: see previous page	42-42.5 FIXED FIXED-SATELLITE (space-to-Earth) NG150 Mobile 5.551H 5.551I US211	
42.5-43.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 MOBILE except aeronautical mobile 5.550B RADIO ASTRONOMY 5.149 5.547			42.5-43.5 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile RADIO ASTRONOMY US342	42.5-43.5 RADIO ASTRONOMY US342	
43.5-47 MOBILE 5.553 5.553A MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE			43.5-45.5 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) G117	43.5-45.5	
			45.5-46.9 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIONAVIGATION-SATELLITE 5.554		
5.554			46.9-47 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIONAVIGATION-SATELLITE 5.554	46.9-47 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) RADIONAVIGATION-SATELLITE 5.554	
47-47.2 AMATEUR AMATEUR-SATELLITE			47-48.2	47-47.2 AMATEUR AMATEUR-SATELLITE	Amateur Radio (97)
47.2-47.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.550C 5.552 MOBILE 5.553B 5.552A				47.2-48.2 FIXED FIXED-SATELLITE (Earth-to-space) US297 MOBILE NG65	Satellite Communicatio (25) Upper Microwave Flexible Use (30)

* * * * *

(251) US251 The band 12.75-13.25 GHz is also allocated to the space research (deep space) (space-to-Earth) service for reception only at Goldstone, CA (35° 20' N, 116° 53' W). Non-Federal space and earth stations must coordinate their proposed operations in the 12.75-13.25 GHz band with NASA in order to protect Federal space research service operations at Goldstone, CA, from harmful interference.

* * * * *

(d) * * *

* * * * *

(52) NG52 Except as provided for by paragraph (d)(527) of this section, use of the band 10.7-11.7 GHz (space-to-Earth) by geostationary satellites in the fixed-satellite service (FSS) shall be limited to international systems, i.e., other than domestic systems.

(53) NG53 In the band 13.15-13.25 GHz, the following provisions shall apply:

(i) [Reserved]

(ii) [Reserved]

(iii) In the band 13.15-13.25 GHz, fixed television auxiliary stations licensed pursuant to applications accepted for filing before September 1, 1979, may continue operation, subject to periodic license renewals.

(iv) [Reserved]

Note 11 to paragraph (d)(53): The provisions of paragraphs (d)(53)(i) through (iii) of this section shall not apply to geostationary satellite orbit (GSO) FSS operations in the band 12.75-13.25 GHz.

* * * * *

(57) [Reserved]

* * * * *

(144) NG144 In the United States, the use of the band 12.7-13.25 GHz may include FSS (space-to-Earth) by non-geostationary-satellite systems on a primary basis, subject to accepting harmful interference from earth stations providing FSS (Earth-to-space) on a co-primary basis. Use of the primary allocation for FSS (Earth-to-space) in the 12.7-13.25 GHz band in the United States is limited to individually licensed gateway or feeder link earth stations and earth stations in motion aboard aircraft and maritime vessels for communications to geostationary space stations, subject to the limitations of Resolution 121 (WRC-23). Transmissions from earth stations in motion aboard aircraft to geostationary space stations are limited to altitudes of three kilometers or higher while within the airspace of the United States. In the band 12.7-13.25 GHz for NGSO FSS space stations, the power flux density at the Earth's surface, which would be obtained under assumed free-space propagation conditions, produced by emissions from a space station for all conditions and for all methods of modulation shall not exceed the lower of the following values:

(i) −150 dB(W/m2) in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; −150 + (δ−5)/2 dB(W/m2) in any 4 kHz band for angles of arrival (δ) (in degrees) between 5 and 25 degrees above the horizontal plane; and −140 dB(W/m2) in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane; or

(ii) −126 dB(W/m2) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; −126 + (δ−5)/2 dB(W/m2) in any 1 MHz band for angles of arrival (δ) (in degrees) between 5 and 25 degrees above the horizontal plane; and −116 dB(W/m2) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

(iii) Applications for new FSS (Earth-to-space) space and earth station licenses in the 12.7-12.75 GHz band in the United States will not be accepted after [the effective date of this Report and Order]. FSS

(Earth-to-space) and FSS (space-to-Earth) operations must protect fixed service and mobile service systems operating on a primary basis in 12.7-13.25 GHz from harmful interference. Grandfathered fixed service and mobile service systems will operate on a primary basis in the United States until [the date of publication of this Report and Order in the Federal Register plus 10 years]. After this date, grandfathered FS and MS systems may continue to operate in the 12.75-13.25 GHz band, but on an unprotected, non-harmful interference basis vis-à-vis FSS (Earth-to-space) and FSS (space-to-Earth) operations.

* * * * *

(145-146) [Reserved]

* * * * *

(150) NG150 Use of the band 42.0-42.5 GHz in the United States by FSS (space-to-Earth) is limited to communications with gateway and feeder link earth stations.

* * * * *

(151) [Reserved]

* * * * *

(527) NG527A Earth Stations in Motion (ESIMs), as regulated under part 25 of this chapter, are an application of the fixed-satellite service (FSS) and the following provisions shall apply:

(i) In the bands 10.7-11.7 GHz, 19.3-19.4 GHz, and 19.6-19.7 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary and non-geostationary satellites, subject to the conditions that these earth stations may not claim protection from transmissions of non-Federal stations in the fixed service and that non-geostationary-satellite systems not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.

(ii) In the bands 11.7-12.2 GHz (space-to-Earth), 12.75-13.25 GHz band (Earth-to-space), 14.0-14.5 GHz (Earth-to-space), 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space), ESIMs may be authorized to communicate with geostationary satellites on a primary basis.

(iii) In the bands 11.7-12.2 GHz (space-to-Earth), 12.7-13.25 GHz band (space-to-Earth), 14.0-14.5 GHz (Earth-to-space), 18.3-18.6 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.4-28.6 GHz (Earth-to-space), and 29.5-30.0 GHz (Earth-to-space), ESIMs may be authorized to communicate with non-geostationary satellites, subject to the condition that non geostationary-satellite systems may not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.

(iv) In the band 17.8-18.3 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary and non-geostationary satellites on a secondary basis, subject to the condition that non-geostationary-satellite systems not cause unacceptable interference to, or claim protection from, geostationary-satellite networks.

(v) In the bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space), ESIMs may be authorized to communicate with geostationary and non-geostationary satellites, subject to the condition that geostationary-satellite networks may not cause unacceptable interference to, or claim protection from, non-geostationary satellite systems in the fixed-satellite service.

(vi) In the band 17.3-17.8 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary satellites and non-geostationary satellites on an unprotected basis.

(vii) In the band 12.75-13.25 GHz, ESIMs communicating with GSO systems in the 12.75-13.25 GHz band (Earth-to-space) are limited to aircraft operating at altitude and maritime vessels operating away from the U.S. coast consistent with Resolution 121 (WRC-23). In addition, ESIMs on aircraft within the airspace of the United States may transmit at altitudes only at or above three kilometers.

* * * * *

PART 100—SPACE AND EARTH STATION SERVICES

4. The authority citation for part 100 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302, 303, 307, 309, 310, 319, 332, 605, and 721, unless otherwise noted.

5. Amend section 100.3 by revising the definition of "Extended Ku-band" to read as follows:

* * * * *

Extended Ku-band. The 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), 12.7-13.25 GHz (Earth-to-space)(space-to-Earth), and 13.75- 14.0 GHz bands (Earth-to-space) FSS frequency bands.

* * * * *

6. Amend section 100.212 by revising paragraphs (i) and (j) to read as follows:

* * * * *

§ 100.212 Field strength limits and Power flux-density

* * * * *

(i) 40.5-42.5 GHz – NGSO. In the 40.5-42.5 GHz band, the power flux density at the Earth's surface produced by emissions from a non-geostationary space station for all conditions and for all methods of modulation shall not exceed the following values (these values are obtained under assumed free-space propagation conditions):

(1) −115 dB(W/m2) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

(2) −115 + 0.5 (δ−5) dB(W/m2) in any 1 MHz band for angles of arrival δ (in degrees) between 5 and 25 degrees above the horizontal plane; and

(3) −105 dB(W/m2) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

(j) 40.5-42.5 GHz – GSO. In the 40.5-42.5 GHz band, the power flux-density at the Earth's surface produced by emissions from a geostationary space station for all conditions and for all methods of modulation shall not exceed the following values (these values are obtained under assumed free-space propagation conditions):

(1) −120 dB(W/m2) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane;

(2) −120 + (δ−5) dB(W/m2) in any 1 MHz band for angles of arrival δ (in degrees) between 5 and 15 degrees above the horizontal plane;

(3) −110 + 0.5 (δ−15) dB(W/m2) in any 1 MHz band for angles of arrival δ (in degrees) between 15 and 25 degrees above the horizontal plane; and

(4) −105 dB(W/m2) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane

* * * * *

7. Amend section 100.275by revising paragraphs (n) and (o) to read as follows:

§ 100.275 Earth station coordination requirements.

* * * * *

(n) As it relates to NGSO FSS earth stations individual or blanket license applications may be filed for operation in the 10.7-12.7 GHz, 12.7-13.25 GHz, 14-14.5 GHz, 17.3-17.7 GHz, 17.7-17.8 GHz, 17.8-18.6 GHz, 18.8-19.4 GHz, 19.6-20.2 GHz, 28.35-29.1 GHz, or 29.5-30.0 GHz bands; however,

ESIMs cannot operate in the 28.35-28.4 GHz band and blanket licensing in the 10.7-11.7 GHz, 17.7-17.8 GHz, 17.8-18.3 GHz, 19.3-19.4 GHz, and 19.6-19.7 GHz bands is on an unprotected basis with respect to current and future systems operating in the fixed service. Individual license applications only may be filed for operation in the 13.75-14 GHz or 27.5-28.35 GHz bands. Individual license applications only may be filed for gateway operations in the 12.7-13.25 GHz band.

(o) As it relates to GSO FSS earth stations individual or blanket license applications may be filed for operation in the 17.3-17.8 GHz band; however, blanket licensed earth stations shall operate on an unprotected basis with respect to DBS feeder link earth stations. All receiving FSS earth stations shall operate on an unprotected basis with respect to the Fixed Service in the 17.7-17.8 GHz band. As it relates to GSO FSS Earth Stations a blanket license application for operation in the 10.7-12.2 GHz, 12.75-13.25 GHz, or 14-14.5 GHz bands may be filed on FCC Form 312, with a Schedule B for each large (5 meters or larger) hub station antenna and each representative type of small antenna (less than 5 meters) operating within the network; however, blanket licensing in the 10.7-11.7 GHz band is on an unprotected basis with respect to the fixed service. Applications to license networks of earth stations operating in the 11.7-12.2 GHz and 14.0-14.5 GHz bands under blanket operating authority must comply with the requirements in §§ 100.270 through 100.279. Individual license applications only may be filed for gateway operations in the 12.75-13.25 GHz band.

* * * * *

APPENDIX C

Proposed Rule Changes

For the reasons discussed in the document above, the Federal Communications Commission amends 47 CFR part 2 as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

1. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Amend § 2.106(a) by revising pages 52 -56 of the Allocation Table

§ 2.106 Table of Frequency Allocations

(a) * * *

* * * * *

15.63-15.7 RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION			15.63-15.7 RADIOLOCATION 5.511E 5.511F US511E AERONAUTICAL RADIONAVIGATION US260 US211	15.63-15.7 AERONAUTICAL RADIONAVIGATION US260 US211 US511E	Aviation (87)
15.7-16.6 RADIOLOCATION 5.512 5.513			15.7-16.6 RADIOLOCATION G59	15.7-17.2 Radiolocation	Private Land Mobile (90)
16.6-17.1 RADIOLOCATION Space research (deep space) (Earth-to-space) 5.512 5.513			16.6-17.1 RADIOLOCATION G59 Space research (deep space) (Earth-to-space)		
17.1-17.2 RADIOLOCATION 5.512 5.513			17.1-17.2 RADIOLOCATION G59		
17.2-17.3 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) 5.512 5.513 5.513A			17.2-17.3 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION G59 SPACE RESEARCH (active)	17.2-17.3 Earth exploration-satellite (active) Radiolocation Space research (active)	
17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 (space-to-Earth) 5.516A 5.516B Radiolocation 5.514	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 BROADCASTING-SATELLITE Radiolocation 5.514 5.515	17.3-17.7 FIXED-SATELLITE (Earth-to-space) 5.516 Radiolocation 5.514	17.3-17.7 Radiolocation US259 G59 US402 G117	17.3-17.7 FIXED-SATELLITE (Earth-to-space) (space-to-Earth) NG527A BROADCASTING-SATELLITE US259 US402 NG58	Satellite Communications (25)
17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	17.7-17.8 FIXED FIXED-SATELLITE (space-to-Earth) 5.517 5.517A (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.515	17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE	17.7-17.8 US334 G117	17.7-17.8 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) NG527A US334 NG58	Satellite Communications (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.517A (Earth-to-space) 5.516 MOBILE 5.519		17.8-18.6 FIXED-SATELLITE (space-to-Earth) US334 G117	17.8-18.142 FIXED Fixed-satellite (space-to-Earth) NG527A US334 US519	
				18.142-18.3 FIXED FIXED-SATELLITE (space-to-Earth) NG527A INTER-SATELLITE 5.521A US334 US519	
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FIXED
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FIXED-SATELLITE (space-to-Earth)
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FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A
MOBILE-SATELLITE (space-to-Earth)

5.524 5.525 5.526 5.527 5.528 5.529</td><td>19.7-20.1
FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A
Mobile-satellite (space-to-Earth)

5.524</td><td>19.7-20.2
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MOBILE-SATELLITE (space-to-Earth)

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US334</td><td>Satellite Communications (25)</td></tr>
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FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B 5.516B 5.527A
MOBILE-SATELLITE (space-to-Earth)

5.524 5.525 5.526 5.527 5.528</td></tr>
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FIXED-SATELLITE (space-to-Earth)
MOBILE-SATELLITE (space-to-Earth)
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MOBILE
BROADCASTING-SATELLITE 5.208B

5.530A 5.530B 5.531</td><td colspan="2">21.4-22
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MOBILE</td><td></td></tr>
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24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE except aeronautical mobile 5.338A 5.532AB	24.65-24.75 FIXED 5.532AA INTER-SATELLITE MOBILE except aeronautical mobile 5.338A 5.532AB RADIOLOCATION-SATELLITE (Earth-to-space)	24.65-24.75 FIXED FIXED-SATELLITE (Earth-to-space) 5.532B INTER-SATELLITE MOBILE 5.338A 5.532AB	24.65-24.75 INTER-SATELLITE RADIOLOCATION-SATELLITE (Earth-to-space)		
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25.25-25.5 FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB Standard frequency and time signal-satellite (Earth-to-space)			25.25-25.5 FIXED INTER-SATELLITE 5.536 MOBILE Standard frequency and time signal-satellite (Earth-to-space)	25.25-25.5 Inter-satellite 5.536 Standard frequency and time signal-satellite (Earth-to-space)	RF Devices (15)
25.5-27 EARTH EXPLORATION-SATELLITE (space-to-Earth) 5.536B FIXED 5.534A INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB SPACE RESEARCH (space-to-Earth) 5.536C Standard frequency and time signal-satellite (Earth-to-space) 5.536A			25.5-27 EARTH EXPLORATION-SATELLITE (space-to-Earth) FIXED INTER-SATELLITE 5.536 MOBILE SPACE RESEARCH (space-to-Earth) Standard frequency and time signal-satellite (Earth-to-space) 5.536A US258	25.5-27 SPACE RESEARCH (space-to-Earth) Inter-satellite 5.536 Standard frequency and time signal-satellite (Earth-to-space) 5.536A US258	
27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE 5.338A 5.532AB	27-27.5 FIXED 5.534A FIXED-SATELLITE (Earth-to-space) INTER-SATELLITE 5.536 5.537 MOBILE 5.338A 5.532AB		27-27.5 FIXED INTER-SATELLITE 5.536 MOBILE	27-27.5 Inter-satellite 5.536	
27.5-28.5 FIXED 5.537A FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.539 MOBILE 5.538 5.540			27.5-30	27.5-28.35 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE INTER-SATELLITE 5.521A	RF Devices (15) Satellite Communications (25) Upper Microwave Flexible Use (30) Fixed Microwave (101)
				28.35-29.1 FIXED-SATELLITE (Earth-to-space)	RF Devices (15) Satellite

				NG165 NG527A INTER-SATELLITE 5.521A	Communications (25)
28.5-29.1 FIXED FIXED-SATELLITE (Earth-to-space) 5.484A 5.516B 5.517A 5.523A 5.539 MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540				NG62	
29.1-29.5 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.517A 5.523C 5.523E 5.535A 5.539 5.541A MOBILE Earth exploration-satellite (Earth-to-space) 5.541 5.540				29.1-29.25 FIXED FIXED-SATELLITE (Earth-to-space) NG166 MOBILE INTER-SATELLITE 5.521A 29.25-29.5 FIXED-SATELLITE (Earth-to-space) NG527A NG535A INTER-SATELLITE 5.521A NG62	Satellite Communications (25) Fixed Microwave (101) Satellite Communications (25)
29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.525 5.526 5.527 5.529 5.540	29.5-29.9 FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 Earth exploration-satellite (Earth-to-space) 5.541 Mobile-satellite (Earth-to-space) 5.540 5.542		29.5-30 FIXED-SATELLITE (Earth-to-space) NG527A MOBILE-SATELLITE (Earth-to-space) INTER-SATELLITE 5.521A 5.525 5.526 5.527 5.529 5.543	
29.9-30 FIXED-SATELLITE (Earth-to-space) 5.484A 5.484B 5.516B 5.527A 5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) 5.541 5.543 5.525 5.526 5.527 5.538 5.540 5.542					
30-31 FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth) 5.542			30-31 FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth) G117	30-31 Standard frequency and time signal-satellite (space-to-Earth)	
31-31.3 FIXED 5.338A 5.543B MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space research 5.544 5.545 5.149			31-31.3 Standard frequency and time signal-satellite (space-to-Earth) US211 US342	31-31.3 FIXED NG60 MOBILE Standard frequency and time signal-satellite (space-to-Earth) US211 US342	Fixed Microwave (101)
31.3-31.5 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340			31.3-31.8 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive)		
31.5-31.8 EARTH EXPLORATION-SATELLITE (passive)	31.5-31.8 EARTH EXPLORATION-SATELLITE (passive)	31.5-31.8 EARTH EXPLORATION-SATELLITE (passive)	US246		Page 56

RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149 5.546	RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	RADIO ASTRONOMY SPACE RESEARCH (passive) Fixed Mobile except aeronautical mobile 5.149		

APPENDIX D

Final Regulatory Flexibility Act Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Federal Communications Commission (Commission) incorporated an Initial Regulatory Flexibility Analysis (IRFA) in the *Spectrum Abundance NPRM* (*Notice*).[2] The Commission sought written public comment on the proposals in the *Notice* including comment on the IRFA. No comments were filed addressing the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA and it (or summaries thereof) will be published in the Federal Register.[3]

A. Need for, and Objectives of, the Rules

2. In the *Report and Order,* adopted as part of the Commission's Satellite Spectrum Abundance proceeding (*Spectrum Abundance R&O*), the Commission takes additional steps to deliver on our long-standing objectives of increasing opportunities for competition, innovation, and investment in the space services sector by making available spectrum for satellite communications in the 12.7-13.25 GHz band (12.7 GHz band) and 42.0-42.5 GHz band (42 GHz band). Through the adopted rules, the Commission promotes technological innovation, grow the nation's economy, and facilitate increased connectivity for all Americans. The unlocking of available spectrum in these four "spectrum neighborhood" bands provide fertile ground for satellite broadband services.

3. The Commission sought comment on two notices of proposed rulemaking, and the ways the 12.7 GHz band, which is part of the Ku-band, and the 42 GHz band could be used more efficiently and intensively by terrestrial wireless communications for innovation, economic growth, and to increase connectivity in the United States.[4] The Commission notes that a mixture of terrestrial wireless and satellite uses currently operate in the 12.7 GHz band as well as limited Federal operations.[5] The 42 GHz band, which is not currently used for any existing services in the United States, is allocated to non-Federal fixed service (FS) and mobile service (MS) on a primary basis,[6] but are not allocated to any satellite services.

4. The *Notice* sought comment on using these bands more intensively for satellite communications, including as an alternative, or a complement to the previous proposals for terrestrial wireless communications in the band. To achieve more intensive use of the 12.7 GHz band by satellite communications, the *Notice* requested comment on removing existing regulatory restrictions and opening the band to a wider range of satellite operations. Additionally, for more intensive use of the 42 GHz band, the *Notice* requested comment on adding for the first time, an allocation for satellite communications in the fixed-satellite service (FSS).[7] While the Commission sought to more efficiently

[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] *Satellite Spectrum Abundance, Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use, Shared Use of the 42-42.5 GHz Band, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services,* SB Docket No. 25-180, GN Docket No, 22-352, WT Docket No. 23-158, GN Docket No. 14-177, Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, 40 FCC Rcd 3794 (2025).

[3] 5 U.S.C. § 604.

[4] Small Business Jobs Act of 2010, Pub. L. No. 111-240, 124 Stat. 2504 (2010).

[5] 5 U.S.C. § 604 (a)(3).

[6] 5 U.S.C. § 604.

[7] 13 CFR § 121.903.

and intensively expand use of these bands, the Commission remained mindful of the continued need to protect incumbent spectrum users from the risk of harmful interference, and sought comment on ways to protect incumbent spectrum users in the band, as well as ways to protect spectrum users, particularly Federal operators, in adjacent bands.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

5. No comments were filed addressing the impact of the proposed rules on small entities.

C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

6. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA,[5] the Commission is required to respond to any comments filed by the Chief Counsel of the Small Business Administration (SBA) Office of Advocacy, and provide a detailed statement of any changes made to the proposed rules as a result of those comments.[6] The Chief Counsel did not file any comments in response to the proposed rules in this proceeding.

D. Description and Estimate of the Number of Small Entities to Which the 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.[6] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[7] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act (SBA).[8] 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.[9] 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.[10]

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.[8] In general, a small business is an independent business having fewer than 500 employees.[9] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 34.75 million businesses.[10] Next, "small organizations" are not-for-profit enterprises that are independently owned and operated and are not dominant in their field.[11] While we do not have data regarding the number of non-profits that meet that criteria, over 99 percent of nonprofits have fewer than 500 employees.[12] Finally, "small governmental jurisdictions" are defined as cities, counties, towns, townships, villages, school districts, or special districts with populations of less than fifty thousand.[13] Based on the 2022 U.S. Census of Governments data, we estimate that at least 48,724 out of 90,835 local

[8] 5 U.S.C. § 601(3)-(6).

[9] *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.

[10] *Id*.

[11] 5 U.S.C. § 601(4).

[12] *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/.

[13] 5 U.S.C. § 601(5).

government jurisdictions have a population of less than 50,000.[14]

9. The rules adopted in the *Spectrum Abundance R&O* will apply to small entities in the industries identified in the chart below by their six-digit North American Industry Classification System (NAICS)[15] codes and corresponding SBA size standard.[16] Where available, we also provide additional information regarding the number of potentially affected entities in the identified industries below.

2022 U.S. Census Bureau Data by NAICS Code **Regulated Industry (Footnotes specify potentially affected entities within a regulated industry where applicable)**	**NAICS Code**	**SBA Size Standard**	**Total Firms**[17]	**Total Small Firms**[18]	**% Small Firms**
Radio and Television Broadcasting and Wireless Communications Equip Manufacturing[19]	334220	1,250 employees	155	136	87.74%
Wireless Telecommunications Carriers (except Satellite)[20]	517112	1,500 employees	1,184	1,081	91.30%
Satellite Telecommunications[21]	517410	$44 million	332	195	58.73%
All Other Telecommunications[22]	517810	$40 million	1,673	1,007	60.19%

[14] *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.

[15] 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.

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

[17] *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., Table 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., Table EC2200SIZEREVFIRM, 2025.

[18] *Id.*

[19] Affected Entities in this industry include Radio Frequency Equipment Manufacturers.

[20] Affected Entities in this industry include Fixed Microwave Services and Wireless Carriers and Service Providers.

[21] Affected Entities in this industry include Fixed Satellite Small Transmit/Receive Earth Stations, Fixed Satellite Very Small Aperture Terminal (VSAT) Systems and Mobile Satellite Earth Stations.

[22] Affected Entities in this industry include Earth Stations (except Satellite Telecommunications Carriers), Internet Service Providers (Non-Broadband), Non-Licensee Owners of Towers and Other Infrastructure, Online Access Service Providers, Satellite Telemetry Operations, Satellite Tracking Stations, and Telemetry and Tracking System Operations.

E. 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 adopted 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 requirement and the type of professional skills necessary for preparation of the report or record.[23]

11. In the *Spectrum Abundance R&O*, the Commission identifies two broad categories of costs that would have an economic impact on small businesses and other entities: (1) increases in expenditures needed to update existing infrastructure to incorporate access to the newly available bands and serve a larger pool of customers, and (2) costs of compliance with the revised rules. The analysis in the benefits section of the *Spectrum Abundance R&O*[24] accounts for the category 1 costs – i.e., the costs to serve additional customers by multiplying estimated market value gains by an estimated profit margin. This amounts to subtracting the incremental costs of serving new customers from incremental revenue. Moreover, because accounting profits include fixed costs, the approach takes into consideration potential costs to upgrade infrastructure to incorporate the additional spectrum bands. Although such costs may be higher up front for small and other entities, the Commission does not have data that would allow us to isolate the timing with which fixed costs are incurred.

12. With respect to category 2, the Commission recognizes that satellite operators providing FSS would need to familiarize themselves with the revised rules. Familiarization costs may be associated with or result from any work that operators wish to take advantage of the revised rules may need to perform to familiarize themselves with the rule revisions.

13. The Commission estimates familiarization costs by using needed labor hours worked by engineers and attorneys to make sure that satellite operators understand and comply with the new rules. Commission staff estimates that telecommunications aerospace engineers are compensated at a rate of $100.11/hour and telecommunications attorneys are compensated at $157.65/hour.[25] Commission staff

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[23] 5 U.S.C. § 604(a)(5).

[24] This *Spectrum Abundance R&O* results from the rulemaking proceedings that were launched in May 2025 to examine ways to use four frequency ranges more intensively by satellite communications: the 12.7 GHz band; the 42 GHz band; the 51.4-52.4 GHz band; and the "W-band" frequencies at 92.0-94.0 GHz, 94.1-100 GHz, 102.0-109.5 GHz, and 111.8-114.25 GHz. *Satellite Spectrum Abundance, Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use, Shared Use of the 42-42.5 GHz Band, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services,* SB Docket No. 25-180, GN Docket No, 22-352, WT Docket No. 23-158, GN Docket No. 14-177, Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, 40 FCC Rcd 3794 (2025) (Satellite *Spectrum Abundance FNPRM*); *see also Expanding Flexible Use of the 12.2-12.7 GHz Band; Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use*, WT Docket No. 20-443, GN Docket No. 22-352, Report and Order and Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking and Order, 38 FCC Rcd 5283 (2023) (*12.7 GHz Band NPRM*); *Shared Use of the 42-42.5 GHz Band; Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, WT Docket No. 23-158, GN Docket No. 14-177, Notice of Proposed Rulemaking, 38 FCC Rcd 6362 (2023) (*42 GHz Band NPRM*). This *Spectrum Abundance R&O* takes action only on the 12.7 GHz and 42 GHz bands. The proposals for the 51.4-52.4 GHz band and W-band are not addressed at this time.

[25] The Bureau of Labor Statistics reports May 2024 hourly mean wages for aerospace engineers and lawyers in the telecommunications industry as $69.94/hour and $107.98/hour, respectively. Bureau of Labor Statistics (BLS), *Occupational Employment and Wage Statistics Query System*, https://data.bls.gov/oes/#/industry/517000 (accessed Aug. 19, 2026). According to the Bureau of Labor Statistics, as of December 2025, civilian wages and salaries averaged $33.72/hour and benefits averaged $15.60/hour. Using these figures, benefits constitute a markup of $15.60/$33.72 ~ 46%. Taking 46% for cost of benefits, we arrive at an hourly compensation of $100.11/hour ($69.94/hour × $146%), and $157.65/hour ($107.98/hour × $146%), for engineers and attorneys, respectively. *See*
(continued….)

estimates that approximately 54 satellite operators may be impacted by our rules, and conservatively assume that all 54 will require familiarization with the rules.[26] For familiarization, Commission staff assumes reading and understanding the *Satellite Spectrum Abundance Report and Order* will take six engineer hours of work and two attorney hours of work for each regulated entity, implying $50,000 of costs across each regulated entity.[27] Because these rules replace existing rules, future entrants would not be expected to incur additional familiarization costs because they would need to familiarize themselves with only one set of rules prior to entry.

F. Discussion of Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered

14. The RFA requires an agency to provide "a description of the steps the agency has taken to minimize the significant economic impact on small entities…including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected."[28]

15. As discussed above, the rules adopted would only lead to minimal per entity compliance costs amounting to a one-time familiarization cost of $928 for those entities that choose to update their system in light of the new spectrum that the *Spectrum Abundance R&O* makes available to satellite operators. Such entities may also face more substantial infrastructure and other costs of doing business, but all such costs are voluntary. The majority of the 54 GSO and NGSO satellite operators that are estimated to need to familiarize themselves with the rules are not considered small entities. Because estimated compliance costs are expected to be minimal, the Commission does not expect the adopted rules to have a disproportionate impact on small entities.

16. Three alternatives were identified and proposed in this proceeding: (1) limited or no Commission action; (2) adopt rules to make available 1,050 Megahertz of spectrum in Spectrum Neighborhoods that are ideal for Satellite Broadband; and (3) adopt proposed rules that prioritize terrestrial service. Under the first alternative (Limited or No Action), the Commission would not increase the supply of satellite spectrum and would decline to open the 12.7 GHz band and the 42 GHz band for expanded satellite use. The consequence of taking no action is that each of these bands would remain constrained by existing allocations, footnotes, and usage patterns, which significantly limits their utility for the satellite broadband and backhaul applications. Collectively, these foregone opportunities mean that a limited- or no-action approach would perpetuate spectrum underutilization, constrain satellite system capacity, impede competition-driven broadband affordability improvements, and reduce the ability of satellite systems to complement terrestrial networks. For these reasons, the Commission believes this alternative remains inferior to the adopted rules.

17. Under the second alternative, the Commission proposed to adopt rules that would unlock more than 20,000 megahertz of new satellite broadband spectrum, enabling operators to deploy higher

(Continued from previous page)
Press Release, Bureau of Labor Statistics, Employer Costs for Employee Compensation—March 2026 (June 12, 2026), https://www.bls.gov/news.release/pdf/ecec.pdf (*Benefit Markup*).

[26] *Review of the Commission's Assessment and Collection of Regulatory Fees for Fiscal Year 2025; Assessment and Collection of Space and Earth Station Regulatory Fees for Fiscal Year 2025*, MD Docket Nos. 25-190, 24-85, Report and Order, 40 FCC Rcd 7557, 7605-07, Appx. E. This estimate is conservative because not all operators will choose to revise their operations to enable usage of the new spectrum.

[27] (6 hours of engineering work × $102.11/hour + 2 hours of legal work × $157.65) × 54 regulatees = $50,110) ~ $50,000.

[28] 5 U.S.C. § 604(a)(6).

capacity networks, reduce capacity constraints, and support innovative next generation NGSO architectures. These improvements will expand broadband availability, enhance service quality and reliability, and strengthen competition, particularly benefiting rural and remote communities that depend on satellite connectivity. By fostering increased investment, improving network scalability, and promoting U.S. leadership in advanced satellite technologies, this alternative delivers substantial economic and consumer welfare gains while maintaining appropriate protections for incumbent users.

18. Under the third alternative, the Commission proposed to prioritize terrestrial services in each of the bands under consideration. For each band, the Commission finds that doing so would lead to public interest benefits that are substantially below those that would be possible under the rules that we adopt.

19. As commenters observe, in the 12.7 GHz band, sharing between fixed services and satellite operations is only feasible where earth stations are individually licensed and geographically separated, which is incompatible with the ubiquitous, blanket licensed NGSO user terminals the Commission seeks to support. FS transmissions in the same band and area would effectively preclude NGSO FSS downlinks, making terrestrial prioritization infeasible from an interference management perspective. In the 42 GHz band, the Commission finds that it is feasible to authorize FSS downlinks on a primary basis while still permitting terrestrial fixed services on a co primary basis and protecting adjacent band RAS operations, allowing both services to operate effectively and making more efficient overall use of the spectrum. Prioritizing terrestrial services would thus leave large swaths of spectrum underutilized, perpetuate existing capacity constraints, and impede the development of high throughput satellite networks.

20. Based on the record and economic analysis, the Commission finds that the second and third proposed rule alternatives offer the greatest net benefit among the three alternatives considered. It finds that the rules adopted in the *Spectrum Abundance R&O* will generate substantial benefits to the communications ecosystem and that these benefits outweigh the expected costs. By increasing the supply of satellite spectrum and enabling more intensive and efficient use of the 12.7 GHz and 42 GHz bands, the rules support measurable gains in producer surplus through enhanced capacity, improved operational efficiency, and expanded opportunities for innovation and investment. The rules also generate important, though unquantified, increases in consumer surplus by supporting more affordable broadband options, expanding service availability in high-cost or hard-to-serve areas, and strengthening the resiliency and performance of broadband networks through satellite-terrestrial complementarity.

G. Report to Congress

21. The Commission will send a copy of the *Spectrum Abundance R&O*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.[29] In addition, the Commission will send a copy of the *Spectrum Abundance R&O*, including this FRFA, to the Chief Counsel for the SBA Office of Advocacy and will publish a copy of the *Spectrum Abundance R&O,* and this FRFA (or summaries thereof) in the Federal Register.[30]

[29] 5 U.S.C. § 801(a)(1)(A).

[30] *Id.* § 604(b).

APPENDIX E

Initial Regulatory Flexibility Act 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 *Spectrum Abundance FNPRM* (*Further Notice*) 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 *Notice*. The Commission will send a copy of the *Notice*, including this IRFA, to the Chief Counsel for the Small Business Administration (SBA) Office of Advocacy.[2] In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register.[3]

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

2. In the *Spectrum Abundance NPRM*,[4] the Commission sought comment on ways that four spectrum bands – the 12.7-13.25 GHz, 42.0-42.5 GHz, 51.4-52.4 GHz, and the W-band frequencies of 92.0-94.0 GHz, 94.1-100 GHz, 102-109.5 GHz, and 111.8.-114.25 GHz – could be made available or be more intensively used for satellite communications. The Commission subsequently adopted the *Spectrum Abundance R&O (Order)* that makes changes to the U.S. Table of Allocations and the FCC rules that unlock two of these spectrum bands for more intensive use by satellite communications.[5] In this *Further Notice*, the Commission seeks comment on ways that additional spectrum resources can be made available, or be more intensively used, for satellite communications to promote technological innovation, to grow the nation's economy, and to facilitate increased connectivity for all Americans. Specifically, the *Further Notice* seeks additional comment on ways to use spectrum resources in the Ku-band,[6] Ka-band,[7] and the D-band[8] more efficiently and intensively, as well as by adopting allocations for inter-satellite links (ISLs) in the 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands. The *Further Notice* also seeks comment on what technical rules should be adopted for ISLs, with the goal of providing a single rule provision that identifies technical requirements for licensing and operation.

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[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] *Satellite Spectrum Abundance, Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use, Shared Use of the 42-42.5 GHz Band, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services,* SB Docket No. 25-180, GN Docket No, 22-352, WT Docket No. 23-158, GN Docket No. 14-177, Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, 40 FCC Rcd 3794 (2025).

[5] *Satellite Spectrum Abundance, Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use, Shared Use of the 42-42.5 GHz Band, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services,* SB Docket No. 25-180, GN Docket No, 22-352, WT Docket No. 23-158, GN Docket No. 14-177, Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking, FCC 26-XXX (adopted [Sept. 30, 2026]).

[6] The Ku-band commonly refers to a range of frequencies from 12-18 GHz and is already extensively used for satellite communications under existing spectrum allocations.

[7] The Ka-band commonly refers to a range of frequencies from 18-30 GHz and is already extensively used for satellite communications pursuant to existing spectrum allocations.

[8] For purposes of the *Notice*, the D-band refers to spectrum bands above 100 GHz, specifically: 122.25-148.5 GHz, 151.5-164 GHz, 167-174.8 GHz, 191.8-200 GHz, 209-226 GHz, 231.5-250 GHz, and 252-300 GHz bands.

3. To achieve more intensive use of the Ku-band, via satellite communications, the *Further Notice* requests specific comment whether other spectrum bands, located near or adjacent to the conventional and extended Ku-bands,[9] could be used more extensively for satellite communications through changes to our rules and to the U.S. Table of Allocations. The *Further Notice* seeks comments on whether changes to the Commission's rules will allow more intensive use by satellite communications of the 13.75-14.0 GHz, 14.5-15.35 GHz, and 15.43-15.63 GHz bands. For the Ka-band, the *Notice* requests comment whether other spectrum bands, located near or adjacent to the conventional and extended Ka-bands,[10] could be used more extensively for satellite communications through changes to our rules and to the U.S. Table of Allocation. The *Further Notice* seeks comments on changes to the Commission's rules to allow more intensive use by satellite communications of the 18.6-18.8 GHz, 19.4-19.6 GHz, and 29.1-29.5 GHz bands. For the D-band, the *Further Notice* seeks comment on the use of additional spectrum bands above 100 GHz for satellite communications, and specifically we seek comment on adding a primary allocation in the non-Federal column of the U.S. Table for FSS in the D-band frequency bands.

4. While the Commission seeks to more efficiently and intensively expand use of these bands, it is also mindful of the continued need to protect incumbent spectrum users from the risk of harmful interference, and seeks comment on ways to protect incumbent spectrum users in the band, as well as ways to protect spectrum users, particularly Federal operators, in adjacent bands.

B. Legal Basis

5. The proposed action is authorized pursuant to sections 1, 4(i), 157, 301, 303, 307, 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 157, 301, 303, 307, 308, 309, and 310.

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

6. 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. [11] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." [12] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act." [13] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of

[9] The "conventional Ku-band" is defined as the 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space) bands, and the "extended Ku-band" is defined as the 10.95-11.2 GHz (space-to-Earth), 11.45-11.7 GHz (space-to-Earth), and 13.75-14.0 GHz bands (Earth-to-space) bands. 47 CFR § 25.103.

[10] The "conventional Ka-band" is defined as the 18.3-18.8 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 28.35-28.6 GHz (Earth-to-space), and 29.25-30.0 GHz (Earth-to-space) bands, and the "extended Ka-band" is defined as the 17.3-18.3 GHz (space-to-Earth), 18.8-19.4 GHz (space-to-Earth), 19.6-19.7 GHz (space-to-Earth), 27.5-28.35 GHz (Earth-to-space), and 28.6-29.1 GHz (Earth-to-space) FSS bands. 47 CFR § 25.103.

[11] 5 U.S.C § 603(b)(3).

[12] *Id.* § 601(6).

[13] *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."

operation; and (3) satisfies any additional criteria established by the SBA.[14] 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.[15]

7. 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.[16] In general, a small business is an independent business having fewer than 500 employees.[17] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 34.75 million businesses.[18] Next, "small organizations" are not-for-profit enterprises that are independently owned and operated and not dominant in their field.[19] While we do not have data regarding the number of non-profits that meet that criteria, over 99 percent of nonprofits have fewer than 500 employees.[20] Finally, "small governmental jurisdictions" are defined as cities, counties, towns, townships, villages, school districts, or special districts with populations of less than fifty thousand.[21] 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.[22]

8. The rules proposed in the *Further Notice* will apply to small entities in the industries identified in the chart below by their six-digit North American Industry Classification System (NAICS)[23] codes and corresponding SBA size standard.[24] Where available, we also provide additional information regarding the number of potentially affected entities in the industries identified below.

[14] 15 U.S.C. § 632.

[15] 13 CFR 121.903.

[16] 5 U.S.C. § 601(3)-(6).

[17] *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.

[18] *Id*.

[19] 5 U.S.C. § 601(4).

[20] *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/.

[21] 5 U.S.C. § 601(5).

[22] *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.

[23] 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.

[24] The size standards in this chart are set forth in 13 CFR 121.201, by six digit North American Industrial Classification System (NAICS) code.

2022 U.S. Census Bureau Data by NAICS Code

Regulated Industry (NAICS Classification)	NAICS Code	SBA Size Standard	Total Firms[25]	Total Small Firms[26]	% Small Firms
Wired Telecommunications Carriers[27]	517111	1,500 employees	3,403	3,027	88.95%
Satellite Telecommunications[28]	517410	$44 million	332	195	58.73%
All Other Telecommunications[29]	517810	$40 million	1,673	1,007	60.19%

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

9. 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. [30]

10. The *Further Notice* proposes to make additional spectrum available for more intensive use by satellite communications. If the proposals in the *Further Notice* are adopted, we expect the overall burden for small and other entities to be less than under our current requirements. Currently, many satellite applicants must compose and file requests to waive the Commission's rules to provide satellite communications in frequency bands where the Commission's rules currently do not permit a broad range of satellite communications. In addition, the proposals seek to relax technical requirements and

[25] *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., Table 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., Table EC2200SIZEREVFIRM, 2025

[26] *Id.*

[27] Affected Entities in this industry include Cable Television Distribution Services, Carrier RespOrgs, Competitive Access Providers, Cable Companies and Systems (Rate Regulation), Cable System Operators (Telecom Act Standard), Competitive Local Exchange Carriers (CLECs), Competitive Local Service Providers, Direct Broadcast Satellite (DBS), Facilities-Based Carriers (International Telecom Carriers), Home Satellite Dish (HSD) Service, Incumbent Local Exchange Carriers (Incumbent LECs), Interexchange Carriers (IXCs), Local Exchange Carriers (LECs), Open Video Systems, Operator Service Providers (OSPs), Operators of Common Carrier Non-Common Carrier Undersea Cable Systems, Other Toll Carriers, Providers of International Telecommunications Transmission Facilities, Satellite Master Antenna Television (SMATV) Systems aka Private Cable Operators (PCOs), and Wired Broadband Internet Access Service Providers.

[28] Affected Entities in this industry include Fixed Satellite Small Transmit/Receive Earth Stations, Fixed Satellite Very Small Aperture Terminal (VSAT) Systems, Mobile Satellite Earth Stations.

[29] Affected Entities in this industry include Earth Stations (except Satellite Telecommunications Carriers), Internet Service Providers (Non-Broadband), Non-Carrier RespOrgs, Non Licensee Owners of Towers and Other Infrastructure, Online Access Service Providers, Radar Station Operations, Satellite Telemetry Operations, Satellite Tracking Stations, Telecommunications Relay Service (TRS) Providers, Telemetry and Tracking System Operations and VoIP Service Providers (via Client-Supplied Telecommunications Connections).

[30] 5 U.S.C. § 603(b)(4).

obligations on all entities, large or small, where existing technical requirements are found to be no longer necessary to protect existing incumbent operators.

11. In addition, opening and expanding the use of additional frequencies for satellite communications should not impose any reporting, recordkeeping, or other compliance requirements on small or other entities in the satellite communications industry. Instead, the Commission believes that the potential expansion of available spectrum resources for satellite communications could have a positive economic impact on small entities in the satellite communications industry. If adopted, these changes could result in changes to the Commission's rules governing satellite communications, thereby creating an economic impact for small and other satellite communications entities who would be required to comply with licensing, reporting, and recordkeeping requirements, either in their existing form or as changed in this rulemaking. In addition, if adopted, measures to protect other spectrum users, including Federal operations, from harmful interference could impose reporting, recordkeeping, and other compliance costs on small entities and other satellite communications entities.

12. The Commission recognizes and accounts for compliance with any rule changes in this proceeding, should they be adopted, may require small entities to hire attorneys, engineers, consultants, or other professionals. In particular, for small entities that are not existing operators, and do not have existing staffing dedicated to regulatory compliance, engineering and legal matters, hiring professional experts may be necessary to make the requisite filings, and to demonstrate compliance. Although the Commission cannot quantify the cost of compliance with any potential rule changes at this time, the majority of the changes upon which comment is sought in the *Further Notice* involve removing restrictions on satellite communications, potentially licensing satellite communications in the additional spectrum bands, and interference avoidance techniques that have been established for satellite communications in other bands. Further, 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 if similar requirements are adopted for this band. Consequently, for all bands, the Commission does not anticipate small and other satellite communications entities will incur any additional reporting, recording, or other compliance costs for such rule changes, if adopted. The Commission expects that the information it receives in comments and through cost-benefit analyses will help it to identify and evaluate all relevant matters including compliance costs and other burdens on small entities.

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

13. 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.[31] 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."[32]

14. The *Further Notice* seeks comment on ways to free up 1,175 megahertz of spectrum in the Ku- and Ka-band, as well as 138.25 gigahertz of spectrum in the D-band, for more intensive use by satellite communications. These additional spectrum resources can be used by small as well as large entities without distinction. The *Further Notice* does not propose or seek comment on any rule changes

[31] 5 U.S.C. § 603(c).

[32] *Id.* § 603(c)(1)-(4).

that would establish compliance or reporting requirements or timetables, or design standards. As discussed in section D of this IRFA, the economic benefit for small and other satellite communications entities of using existing Commission rules and processes is the likelihood that they will incur minimal incremental costs since these entities may already have the processes and procedures in place to facilitate compliance. Further, if restrictions on the use of these frequencies for satellite communications are eliminated and unnecessary technical requirements are relaxed, small and other satellite communications entities stand to incur less administrative and potentially other compliance costs.

15. In determining the proposals detailed in the *Further Notice*, the Commission does not specifically propose alternatives that could minimize significant economic impact on small entities rather than to seek comment generally on the impact of the proposed changes on small businesses. As discussed above, the proposals in the *Further Notice* do not seek to establish proscriptive regulations but rather seeks to broaden the opportunity for satellite communications to be provided within certain spectrum bands, without having to seek waivers of Commission rules. As such, specific alternatives for small entities does not appear to be needed.

16. The Commission expects to consider more fully the economic impact on small entities following its review of comments filed in response to the *Further Notice,* including costs and benefits information. Alternative proposals and approaches from commenters could also help the Commission further minimize the economic impact on small entities. The Commission's evaluation of the comments filed in this proceeding will shape the final conclusions it reaches, the final alternatives it considers, and the actions it ultimately takes in this proceeding to minimize any significant economic impact that may occur on small entities from the final rules that are ultimately adopted.

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

17. None.

APPENDIX F

Initial Regulatory Flexibility Act 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 *WSS FNPRM* 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 *WSS FNPRM*. The Commission will send a copy of the *WSS FNPRM*, including this IRFA, to the Chief Counsel for the Small Business Administration (SBA) Office of Advocacy.[2] In addition, the *WSS FNPRM* and IRFA (or summaries thereof) will be published in the Federal Register.[3]

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

2. The *WSS FNPRM* seeks comment on ways to make additional spectrum available to support emergent space operations, such as servicing of spacecraft in orbit, assembly and manufacturing in space, lunar surface missions by commercial spacecraft, and a wide range of other activities in space other than providing satellite communications. In the *WSS FNPRM*, the Commission continues its efforts to identify spectrum, or ways in which spectrum can be used more efficiently, to support emergent space operations. In particular, we seek comment on ways to make additional non-Federal spectrum available for telemetry, tracking, and command (TT&C) in support of emergent space operations.

3. In addition, the *WSS FNPRM* seeks comment on spectrum bands that might be made available for communications in support of emergent space operations, beyond those that were the focus of the *WSS NPRM* that was released in March 2025.[4] To achieve this goal, we seek comment on the potential use of the following spectrum bands for communications in support of emergent space operations: 2360-2395 MHz, 13.25-13.4 GHz, 18 GHz, and 100-300 GHz bands.

4. For the 2360-2395 MHz band, the *WSS FNPRM* seeks comment on whether the 2360-2390 MHz and the 2390-2395 MHz bands could be made available for use for TT&C in support of emergent space operations in a manner that avoids harmful interference to other spectrum users in the bands or in adjacent bands. We also seek comment on what geographic restrictions, coordination requirements, or technical limits would be necessary to protect other spectrum users in the 2360-2390 MHz or adjacent bands. The *WSS FNPRM* also seeks comment on whether the 2390-2395 MHz, which also has a secondary allocation for non-Federal Space Operations Service (SOS) (Earth-to-space and space-to-Earth) as the 2360-2390 MHz band could be used for communications with emergent space operations.

5. For the 13.25-13.4 GHz band, the *WSS FNPRM* seeks comment on whether this band could be used for communications in support of emergent space operations. We also seek comment on whether the 13.25-13.4 GHz band could be suitable for relaying data in support of emergent space operations, if an allocation for Fixed-Satellite Service (FSS) is adopted in the band. In the event that it is not decided to add an allocation for FSS in the 13.25-13.4 GHz band, we also seek comment on whether the band nonetheless could be made available for TT&C communications in support of emergent space operations.

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[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] *Spectrum Abundance for Weird Space Stuff*, SB Docket No. 26-54, Notice of Proposed Rulemaking, DA 26-16 (rel. Mar. 27, 2026) (*WSS NPRM*).

6. The *WSS FNPRM* also seeks comment on whether proposed allocations for intersatellite service in the 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands would be suitable to provide TT&C and data downlinks and uplinks in support of emergent space operations.

7. For the 100-300 GHz band, the *WSS FNPRM* seeks comment on whether frequencies above 100 GHz could be used for communications in support of emergent space operations. It seeks comment on whether W-bands frequencies (92.0-94.0 GHz; 94.1-100 GHz; 102-109.5 GHz; and 111.8.-114.25 GHz) could be used in support of emergent space operations. It also seeks comment on the specifics of making spectrum above 100 GHz available for communications in support of emergent space operations, such as through an allocation for SOS in these bands on a primary or secondary basis. Alternatively, the *WSS FNPRM* seeks comment as to whether availability could be made through a footnote to the U.S. Table of Allocations (U.S. Table) that permitted non-passive bands above 100 GHz also to be used for SOS in support of emergent space operations. In addition, the *WSS FNPRM* asks whether the use of spectrum above 100 GHz for communications with emergent space operations should be limited to the Earth-to-space direction, or if it is feasible to permit communications in the space-to-Earth direction as an alternative to, or in conjunction with, Earth-to-space communications.

8. For each band, the *WSS FNPRM* seeks comment generally on what changes to the U.S. Table and the Commission's rules would need to be made to effectuate use of the band domestically for communications in support of emergent space operations, as well as the specific manner in which those changes could be effectuated (for example, by creation of an allocation or through a footnote to the U.S. Table). The *WSS FNPRM* seeks comment on the suitability of these bands for communications in support of emergent space operations, particularly regarding whether there are equipment or antenna systems that are readily available for such communications.[5] Finally, it also generally seeks comment as to whether the proposals, if adopted, would have a significant economic impact on small businesses, and what, if any, changes are needed internationally to effectuate these changes, either through bi-lateral or multi-lateral agreements with other countries.

B. Legal Basis

9. The proposed action is authorized pursuant to sections 1, 4(i), 157, 301, 303, 307, 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 157, 301, 303, 307, 308, 309, and 310.

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

10. 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.[6] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[7] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[8] A "small business

[5] *WSS NPRM* at 21 (observing that many applicants for non-Federal communications in support of emergent space operations request authority to operate in the same S-band and X-band allocations that are primarily and heavily used by Federal operators since these bands support readily available, "off-the-shelf" antenna systems that are significantly more cost effective than designing and building customize antenna systems in-house).

[6] 5 U.S.C. § 603(b)(3).

[7] *Id*. § 601(6).

[8] *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."

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.[9] 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.[10]

11. 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.[11] In general, a small business is an independent business having fewer than 500 employees.[12] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 34.75 million businesses.[13] Next, "small organizations" are not-for-profit enterprises that are independently owned and operated and not dominant in their field.[14] While we do not have data regarding the number of non-profits that meet that criteria, over 99 percent of nonprofits have fewer than 500 employees.[15] Finally, "small governmental jurisdictions" are defined as cities, counties, towns, townships, villages, school districts, or special districts with populations of less than fifty thousand.[16] 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.[17]

12. The rules proposed in the *WSS FNPRM* will apply to small entities in the industries identified in the chart below by their six-digit North American Industry Classification System (NAICS)[18] codes and corresponding SBA size standard.[19] Where available, we also provide additional information regarding the number of potentially affected entities in the industries identified below.

2022 U.S. Census Bureau Data by NAICS Code

[9] 15 U.S.C. § 632.

[10] 13 CFR § 121.903.

[11] 5 U.S.C. § 601(3)-(6).

[12] *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.

[13] *Id*.

[14] 5 U.S.C. § 601(4).

[15] *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/.

[16] 5 U.S.C. § 601(5).

[17] *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.

[18] 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.

[19] The size standards in this chart are set forth in 13 CFR § 121.201, by six digit North American Industrial Classification System (NAICS) code.

Regulated Industry (NAICS Classification)	NAICS Code	SBA Size Standard	Total Firms[20]	Total Small Firms[21]	% Small Firms
Wired Telecommunications Carriers[22]	517111	1,500 employees	3,403	3,027	88.95%
Satellite Telecommunications[23]	517410	$44 million	332	195	58.73%
All Other Telecommunications[24]	517810	$40 million	1,673	1,007	60.19%

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

13. 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.[25]

14. In the *WSS FNPRM*, the Commission seeks to make additional spectrum available for certain types of spacecraft and satellite operators, and does not propose to change the way the space station licensing process works. If the proposals in the *WSS FNPRM* are adopted, we expect the overall burden for small and other entities to be less than under our current requirements. For example, adding allocations for SOS in additional frequency bands for non-Federal operations has the potential to eliminate costly coordination with the National Telecommunications and Information Administration (NTIA) to use existing heavily-used Federal bands for TT&C by giving small and other entities a non-Federal alternative.

[20] *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., Table 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., Table EC2200SIZEREVFIRM, 2025

[21] *Id.*

[22] Affected Entities in this industry include Cable Television Distribution Services, Carrier RespOrgs, Competitive Access Providers, Cable Companies and Systems (Rate Regulation), Cable System Operators (Telecom Act Standard), Competitive Local Exchange Carriers (CLECs), Competitive Local Service Providers, Direct Broadcast Satellite (DBS), Facilities-Based Carriers (International Telecom Carriers), Home Satellite Dish (HSD) Service, Incumbent Local Exchange Carriers (Incumbent LECs), Interexchange Carriers (IXCs), Local Exchange Carriers (LECs), Open Video Systems, Operator Service Providers (OSPs), Operators of Common Carrier Non-Common Carrier Undersea Cable Systems, Other Toll Carriers, Providers of International Telecommunications Transmission Facilities, Satellite Master Antenna Television (SMATV) Systems aka Private Cable Operators (PCOs), and Wired Broadband Internet Access Service Providers.

[23] Affected Entities in this industry include Fixed Satellite Small Transmit/Receive Earth Stations, Fixed Satellite Very Small Aperture Terminal (VSAT) Systems, Mobile Satellite Earth Stations.

[24] Affected Entities in this industry include Earth Stations (except Satellite Telecommunications Carriers), Internet Service Providers (Non-Broadband), Non-Carrier RespOrgs, Non Licensee Owners of Towers and Other Infrastructure, Online Access Service Providers, Radar Station Operations, Satellite Telemetry Operations, Satellite Tracking Stations, Telecommunications Relay Service (TRS) Providers, Telemetry and Tracking System Operations and VoIP Service Providers (via Client-Supplied Telecommunications Connections).

[25] 5 U.S.C. § 603(b)(4).

15. In addition, opening and expanding the use of additional frequencies for TT&C and ISL in support of emergent space operations by adding allocations for SOS or ISS to the U.S. Table, or by amending or eliminating limitations in existing footnotes to the U.S. Table, should not impose any reporting, recordkeeping, or other compliance requirements on small or other entities in the satellite communications industry. Instead, the potential expansion of available spectrum resources for communications in support of emergent space operations could have a positive economic impact on small entities in the satellite communications industry. If adopted, these changes could result in changes to the part 25 rules governing satellite communications, thereby creating an economic impact for small and other satellite communications entities who would be required to comply with licensing, reporting, and recordkeeping requirements of part 25, either in their existing form or as changed in this rulemaking. In addition, if adopted, measures to protect other spectrum users, including Federal operations, from harmful interference could impose reporting, recordkeeping, and other compliance costs on small entities and other satellite communications entities.

16. Compliance with any rule changes in this proceeding, should they be adopted, may require small entities to hire attorneys, engineers, consultants, or other professionals. In particular, for small entities that are not existing operators, and do not have existing staffing dedicated to regulatory compliance, engineering and legal matters, hiring professional experts may be necessary to make the requisite filings, and to demonstrate compliance. Although the Commission cannot quantify the cost of compliance with any potential rule changes at this time, the majority of the changes upon which comment is sought in the *WSS FNPRM* involve removing restrictions on satellite communications, potentially licensing satellite communications in the additional spectrum bands, and interference avoidance techniques that have been established for satellite communications in other bands. Further, 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 if similar requirements are adopted for this band. Consequently, for all bands, the Commission does not anticipate small and other satellite communications entities will incur any additional reporting, recording, or other compliance costs for such rule changes, if adopted. The Commission expects that the information it receives in comments and through cost-benefit analyses will help it to identify and evaluate all relevant matters including compliance costs and other burdens on small entities.

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

17. 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.[26] 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."[27]

18. In the *WSS FNPRM*, the Commission seeks comment on adding allocations for TT&C and ISS in spectrum bands in the U.S. Table that do not currently have such allocations, or modifying or eliminating footnotes in the U.S. Table to permit use of non-Federal spectrum bands to support emergent space operations. The *WSS FNPRM* does not propose or seek comment on any rule changes that would establish compliance or reporting requirements or timetables, or design standards. As discussed in section D of this IRFA, the economic benefit for small and other satellite communications entities using or interpreting existing part 25 rules and processes is that they will likely incur minimal incremental costs

[26] 5 U.S.C. § 603(c).

[27] *Id.* § 603(c)(1)-(4).

since these entities may already have the processes and procedures in place to facilitate compliance. Further, if the application of certain footnotes to the U.S. Table are eliminated, small and other satellite communications entities stand to incur less administrative and potentially other compliance costs.

19. In determining the proposals detailed in the *WSS FNPRM*, the Commission proposes alternatives that could minimize significant economic impact on small entities. For example, we propose to expand our focus to any additional spectrum bands that could be made available for communications in support of emergent space operations beyond the bands discussed in the *WSS FNPRM*. We also consider whether such bands could be used for communications in support of emergent space operations without causing interference to existing spectrum users, some of which are small entities. However, we determine that identifying those bands requires additional feedback from small and other entities, including what, if any, changes are needed internationally to effectuate these changes. Therefore, we seek comment from small entities and interested parties on these subjects.

20. To assist with the Commission's evaluation of the economic impact on small entities that may result from the actions and alternatives that have been discussed in this proceeding, the *WSS FNPRM* seeks alternative proposals, and requests information on the potential costs of such alternatives to small entities and other licensees. The Commission expects to consider more fully the economic impact on small entities following its review of comments filed in response to the *WSS FNPRM,* including costs and benefits information. Alternative proposals and approaches from commenters could also help the Commission further minimize the economic impact on small entities. The Commission's evaluation of the comments filed in this proceeding will shape the final conclusions it reaches, the final alternatives it considers, and the actions it ultimately takes in this proceeding to minimize any significant economic impact that may occur on small entities from the final rules that are ultimately adopted.

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

21. None.

APPENDIX G

Regulatory Impact Analysis

A. NEED FOR REGULATORY ACTION

1. In the United States and globally, satellites provide telecommunications infrastructure for communications, including voice, video, audio, and data services, as well as other services.[1] As we observed in the *Notice*, the satellite industry is delivering a new wave of innovation and investment as demand for high-speed connectivity skyrockets thanks to streaming, cloud services, global connectivity initiatives, and emerging AI applications.[2] Additionally, satellites are an increasingly powerful tool in efforts to close the digital divide.[3] With satellite broadband rapidly maturing into an integral and integrated communications technology, the Commission must update its rules to ensure that Americans reap the benefits of innovation and investment by the space industry.[4] This includes ensuring that operators have the capacity that they need to meet consumer needs.

2. As the Commission has previously noted, despite the satellite industry's substantial investment in satellite infrastructure and services, the limited amount of spectrum available to satellite operators presents a barrier to entry and expansion in the industry.[5] Because spectrum is an essential input in the provision of satellite services, and in light of Americans' increasing reliance on satellite services and the need to increase capacity for satellite applications, we find that the regulatory actions that we are undertaking will support more intensive, flexible, and economically efficient use of the 12.7-13.25 GHz and 42-42.5 GHz bands.

3. The rules that we are adopting will make available more than 1,000 megahertz of satellite broadband spectrum that will enable satellite operators to expand high-capacity satellite broadband and backhaul, support innovative NGSO architectures, and improve the availability and quality of satellite services nationwide. At the same time, these changes maintain appropriate protections for incumbent commercial and Federal users of the spectrum and ensure that expanded satellite access enhances spectrum utilization without undermining existing operations.

4. This economically significant regulatory action is submitted to the Office of Information and Regulatory Affairs (OIRA) for interagency review. This regulatory impact analysis (RIA) assesses the costs and benefits, including regulatory compliance costs, associated with this action and is consistent with Executive Order 12866. Comparing the proposed rules with other alternative policy options, we find that the adoption of these proposed rules will result in significant benefits that outweigh the associated costs. This regulatory action is considered a deregulatory action under Executive Order 14192.

B. BENEFITS

5. We estimate that the rules adopted in the *Spectrum Abundance R&O* will generate benefits in terms of increased producer surplus of between $0.7 billion to $4.8 billion with a 3% discount rate and between $0.6 billion to $4.2 billion with a 7% discount rate by increasing satellite operators' access to additional spectrum needed for next-generation satellite networks. Increased spectrum will reduce capacity constraints and improve the scalability of satellite broadband services and thereby increase the economic value that firms can derive from their networks. Much of the spectrum subject to

[1] *Communications Marketplace Report*, GN Docket No. 24-119, 2024 Communications Marketplace Report, 39 FCC Rcd 14116, 14235-36, para. 160 (2024) (*2024 Communications Marketplace Report*).

[2] *Notice*, 40 FCC Rcd at 3795, para. 1 (2025).

[3] *See 2024 Communications Marketplace Report*, FCC 24-136 Rcd at 14336, paras. 371.

[4] *Modernizing Spectrum Sharing for Satellite Broadband,* SB Docket No. 25-157, Report and Order, FCC 26-26, at 2 (May 1, 2026); *see also* 47 U.S.C. § 157(a).

[5] *2024 Communications Marketplace Report*, FCC 24-136 Rcd at 14371-72, paras. 424.

this proceeding is underused, and increased access to these bands by satellite communications would encourage a more efficient and intensive use of the bands. Moreover, by increasing, broadband quality and reach, these changes are also expected to generate substantial economic benefits to consumers. Although we do not quantify these additional consumer benefits, they represent an important component of the overall benefits of the rule.

6. The record of this proceeding provides substantial support for the rules that we are adopting. Satellite operators argue that more intensive use of these bands by satellite communications will ensure U.S. leadership in space-based communications while providing ubiquitous broadband services.[6] Commenters contend that the 12.7 GHz and 42 GHz bands are well suited to accommodate the expected increase in demand due to their proximity to bands that are already used to provide satellite communications.[7]

7. By expanding the satellite spectrum allocation in the 12.7 GHz and 42 GHz band frequencies, the rules adopted in this *Report and Order* will enable satellite operators to deploy higher-capacity systems, while also reducing the marginal cost of adding capacity used to provide satellite connectivity. Collectively, the expanded satellite spectrum directly translates into higher producer surplus by enabling operators to capture part of the value of additional capacity and the improved network performance that results. We quantify producer surplus by estimating the increase in NGSO high throughput satellite (HTS) capacity resulting from this *Report and Order* and mapping that additional capacity into an increase in the market value of U.S. satellite data services based on clearly stated proportionality assumptions.[8]

8. Not all commenters support more intensive use of these bands for satellite communications. In particular, certain commenters recommend repurposing these bands to provide terrestrial services. For example, CTIA advocates setting aside the 12.7 GHz band as a "relocation band" for systems that may be displaced as a result of spectrum reallocations in other proceedings.[9] In its opposition to making additional spectrum, especially in the high GHz ranges, available for satellite communications, Wired Broadband, Inc., advocates for a cost-benefit analysis to determine whether the expanding spectrum benefits the American people.[10] As such, for the purpose of comparison, we use auction-based MHz-POPs benchmarks to the frequency bands in this proceeding, to establish a hypothetical valuation of using the spectrum in question for terrestrial services. We back out the producer surplus that these auction-based values imply in order to assess the opportunity cost of using the spectrum to provide satellite-based services. We apply both valuations at the level of individual band to estimate increases in market values.

9. *Satellite-Based Service Valuation*. According to January 2025 analyst estimates for the years 2024-2034, U.S. satellite data services will grow in market value, measured in terms of total revenue generated from the sale of services to end consumers, from $3.40 billion to $19.43 billion at a

[6] CCIA Comments at 1-2; CSF Reply at 1-2; Digital Liberty Comments at 2, 4; Logos Comments at 3, 5; OTI/PK Comments at 7; SES et al. Comments at 1; SES et al. Reply Comments at 1; SIA Comments at 7; SpaceX Comments at 1-2.

[7] Amazon Kuiper Comments at 2; CSF Reply at 2; OTI/PK Comments at 4; SES et al. Comments at 2.

[8] Our assessment of the impact of new spectrum on NGSO high throughput satellite (HTS) capacity is based on a technical analysis that accounts for key link-budget parameters, including spectral efficiency effects associated with antenna gain, atmospheric attenuation, and rain fade.

[9] CTIA Comments at 2, 5.

[10] *See* Comments of Wired Broadband, Inc., SB Docket No. 25-180, at 3 (July 29, 2025) (representing the interests of Americans injured or disabled by electromagnetic radiation and other interested filing parties).

CAGR of 19.1%.[11] Based on a separate April 2024 report estimating NGSO and GSO HTS capacity in 2023 and 2028, NGSO and GSO capacity will grow between 2023 and 2028 at a compound annual growth rate (CAGR) of 59.1% and 22.2%, respectively, leading to a total HTS CAGR of 56.1%.[12]

10. We base our analysis on the potential relationship between the increase in the supply of satellite capacity and the projected overall growth in the size of the satellite data services market. Based on internal analysis, we estimate an increase in NGSO high throughput satellite (HTS) capacity in the foreseeable future of approximately 25% and 7.2%, respectively, the 12.7 GHz and 42 GHz bands.[13] We relate these estimated increases in capacity to industry analyst projections of the market value of U.S. satellite data services as well as the supply of satellite capacity using two methods discussed below.[14] For both approaches, we then assume that NGSO operators will earn 64.1% in profits on the resulting gain in market value, and we use the product of the gain in market value and profits as our estimate of gains in producer surplus.[15]

11. *Method 1.* We assume that analyst projections do not anticipate the capacity increase that we attribute to the rule changes resulting from the *Report and Order*. For the 12.7 GHz band, we assume that the supply of downlink NGSO high throughput satellite (HTS) capacity is 25% greater than it would be in 2027 absent the rule changes. For the 42 GHz band, we assume that the supply of NGSO high throughput satellite (HTS) capacity is 7.2% greater than it would be in 2027 absent the rule changes.[16] In both cases, we infer that market value will expand proportionally based on the preexisting relationship between satellite market value and capacity. We then project the resulting increase in throughput and market value through 2030.[17] The resulting 2030 total HTS capacity is 73% and 18.6% greater than the

[11] Market.US, *Global Satellite Data Service Market Size, Share Analysis Report By Service Type (Image Data, Data Analytics), By End User (Defense and Security, Agriculture, Maritime, Environment, Energy and Power, Other End Users), Region and Companies - Industry Segment Outlook, Market Assessment, Competition Scenario, Trends and Forecast 2025-2034* (Jan. 2025), https://market.us/report/satellite-data-service-market/.

[12] According to Novaspace, NGSO HTS capacity will grow from 23,701 to 241,764 Gbps and GSO HTS capacity will grow from 3,375 to 9,215 from 2023 to 2028. CAGRs here and elsewhere in this analysis are calculated as the constant rate required to achieve the 2028 value from the 2023 value, according to the formula:

$$CAGR = \left(Value_{EndingYear}/Value_{StartingYear}\right)^{\frac{1}{EndingYear-Starting\,Year}} - 1.$$

All numbers resulting from the calculations are rounded when presented in the text, but calculations in the underlying analysis are conducted using machine precision. Thus any discrepancy in numbers is due to rounding in the text. Novaspace, *Non-geostationary orbit constellations redefining the High Throughput Satellites market landscape* (Apr. 25, 2024), https://nova.space/press-release/non-geostationary-orbit-constellations-redefining-the-high-throughput-satellites-market-landscape/. Total HTS throughput CAGR is calculated as the constant rate required to achieve the 2028 summed value of NGSO and GSO capacity from the 2023 summed value.

[13] We discuss how we estimate the increase in NGSO HTS capacity following our discussion of how we value this additional capacity.

[14] We acknowledge that the relationship between reported projections of satellite market value and projections of satellite capacity is a correlation and assume that this correlation holds when capacity changes.

[15] Space Exploration Technologies Corp., SEC Form S-1, at F-94 (filed May 20, 2026). We note that in light of additional access to spectrum, NGSO operators may be able to achieve capacity gains with smaller constellations and fewer gateway stations under the new rules. As such, we do not attribute any increase in capital expenditures to our rules. We nevertheless multiplied market value gains by an estimate of profit margins for a major NGSO operator to account for potential increases in operating expenditures (i.e., customer and technical support and other staff necessary to serve a larger pool of customers).

[16] The 42 GHz band is adjacent to the 37.5-42 GHz that is already used for FSS downlinks. As such, we assume that gateway operators would be able to relatively quickly incorporate the new band into existing infrastructure.

[17] We use a baseline NGSO HTS capacity of 151,938 Gbps in 2027 and a baseline value of 612,127 Gbps in 2030. These values are estimated by extrapolating from the 2023 NGSO HTS capacity of 23,701 Gbps using the 59.1%

(continued….)

initial projections without the 12.7 GHz and 42 GHz bands respectively.[18] We then calculated the new CAGR of capacity implied by the new 2030 level of capacity and use the new CAGR to estimate the increase in the value of U.S. data services for the years 2026-2030 for each band.[19]

12. The market value gains are then converted to gains in producer surplus by multiplying by the profit margin of 64.1%. We treat the net present value (NPV) increase in producer surplus as a public benefit. Adding the 12.7 GHz band results in $3.7 billion in additional NPV at a 3% discount rate or $3.2 billion NPV at a 7% discount rate. Adding the 42 GHz band results in $1.2 billion in additional NPV at a 3% discount rate or $1.0 billion NPV at a 7% discount rate.[20]

13. *Method 2.* We assume that the industry analysts anticipate that spectrum capacity will increase due to regulatory change. In this scenario, we assume that the *Spectrum Abundance R&O* is part of these anticipated regulatory changes, so that a fraction of the increase in capacity supply from 2025 to 2030 is attributable to the *Report and Order*.

14. We assume that the *Report and Order* will lead to an increase in NGSO HTS capacity of, 25% and 7.2%, respectively, for the 12.7 GHz band and the 42 GHz band, from 2025 to 2027. Based on the 2025 capacity of 60,009 Gbps, these are increases of 15,002 Gbps and 4,335 Gbps respectively. By comparison, a projection based on analyst reports indicates that total HTS capacity will increase by 94,423 Gbps from 2025 to 2027 (using a CAGR of 56.1%). This implies that 15,002 Gbps / 94,423 Gbps = 15.9% of growth is due to inclusion of the 12.7 GHz band or 4,335 Gbps / 94,423 Gbps = 4.6% of growth is due to inclusion of the 42 GHz band. We then assume that the *Report and Order* is responsible for the same fraction of the increase in satellite markets value each year between 2025 and 2030 and calculate the present value gain associated with that fraction of the increase in market value for each band separately. After multiplying by the profit margin of 64.1%, this leads to a producer surplus gain in present value that is attributed to the inclusion of the 12.7 GHz band of $521 million in benefits using a 3% discount rate, or $461 million using a 7% discount rate. For the 42 GHz band, the corresponding gains are $151 million in benefits using a 3% discount rate, or $133 million using a 7% discount rate.

15. *Derivation of increase in NGSO HTS capacity*. Based on estimates in the record, we assume that the 12.7 GHz band will result in an increase in downlink capacity of user link spectrum of 25%.[21] We relate this increase in capacity to industry analyst projections of the market value of U.S. satellite data services using *Method 1* and *Method 2*, described above.

16. As discussed in the *Report and Order*, the FSS allocation in the 42 GHz band is limited to communications with individually licensed earth stations (gateways). Therefore, to quantify the increase in HTS capacity enabled by the 42 GHz band, we estimate 1) total HTS gateway capacity at baseline; and 2) additional capacity attributable to the 42 GHz band.[22] We begin with a gateway

(Continued from previous page)
CAGR rate. Corresponding GSO HTS capacities are calculated using extrapolations of the GSO HTS 2023 capacity based on the 22.2% CAGR and HTS NGSO and HTS GSO capacities are added to calculate total HTS capacity.

[18] In other words, the projected HTS capacity of 625,899 Gbps in 2030 would expand to 1,083,114 Gbps from the inclusion of the 12.7 GHz band or to 742,506 Gbps from the inclusion of the 42 GHz band.

[19] Assuming a baseline total HTS capacity before the new rules take effect in 2025 of 65,053 Gbps, the implied HTS CAGR over 2027 to 2030 from adding the 12.7 GHz and 42 GHz band are, respectively, 74.2% and 61.9%. This is compared to the baseline HTS CAGR of 56.1%.

[20] Given a discount rate r, we calculate an NPV of five years as $\sum_{i=2026}^{2030} \frac{V_i}{(1+r)^{i-2025}}$.

[21] SpaceX Comments at 3-4 (estimating that opening the 12.7 GHz band for NGSO FSS (space-to-Earth) would increase Ku-band downlink throughput by roughly 25% and would enable improved capacity and service to end users).

[22] NGSO FSS frequencies in the Ku-band are typically used for user links, while Ka-, V-, and E-band frequencies are normally used for gateway links.

feeder-link link budget and account for atmospheric attenuation, antenna gains, and rain fade. These adjustments yield frequency-specific changes to the carrier-to-noise ratio (C/N) and, in turn, to spectral efficiency.

17. The first adjustment incorporates a minimum 25-degree elevation angle for gateway earth stations and a tropospheric slant-path model that treats atmospheric attenuation as occurring in the lower atmosphere; clear-sky specific attenuation rates are applied by band.[23] The second adjustment incorporates potential gains to C/N at higher frequencies due to antenna gain. Antenna gain is modeled using a standard parabolic-aperture relationship. We begin with a typical signal gain for an NGSO HTS satellite. Then we increase that gain based on the operating frequency, because for an antenna of fixed size, the gain goes up with the square of the frequency.[24] C/N is then re-computed with the updated gain terms, and spectral efficiency is re-derived under clear-sky conditions. The third adjustment incorporates the effects of rain fall on higher frequencies. To reflect rain fade, we apply band-specific rain-rate thresholds to hourly rainfall data made available by the National Oceanic and Atmospheric Administration (NOAA) and convert the multi-year average exceedances into availability factors (one minus average unavailability).[25] Per-beam throughput is thus obtained after clear-sky attenuation, antenna-gain scaling, and rain-fade/availability adjustments.

18. After the above adjustments, we aggregate per-beam throughput by multiplying by the maximum number of co-frequency spotbeams per gateway and by a conservative estimate of U.S. gateway stations. To obtain an estimate of the number of gateway stations, we first calculate per-beam throughput for existing satellite gateway spectrum in the Ka-band, the V-band, and the E-band, adjusting throughput based on band-specific atmospheric attenuation, antenna gain, and rain fade assumptions. We calibrate total throughput to be consistent with the 2025 capacity of 60,009 Gbps derived on the basis of an analyst report projection.[26] We then back out the number of gateway stations necessary to achieve that throughput.[27] For analytical tractability, we subdivide the gateway stations across the Ka-band, the V-band, and the E-band in proportion to the megahertz of spectrum in those bands.

19. We then assume that 42 GHz spectrum will be incorporated into downlink V-band gateways and derive the 7.2% increase in NGSO HTS capacity that would obtain relative to the end of

[24] We assume that antenna gain for a typical NGSO HTS satellite is 52.6 dBi and that baseline C/N values already incorporate transmit and receive antenna gains. Consequently, changes in frequency are reflected only through incremental gain adjustments in C/N. *See e.g.*, Application for Fixed Satellite Service by SpaceX Services, Inc., SES-AMD-20230525-01127, SESAMD2023052501127 (filed May 25, 2023), https://fcc.report/IBFS/SES-AMD-20230525-01127.

[25] We estimated link unavailability due to rain fade using hourly rainfall data for 85 U.S. gateway stations. A gateway is considered unavailable in any hour where rainfall exceeds the rain fade threshold for that hour. For each gateway and each year, we calculated annual unavailability as the number of hours above this threshold divided by the number of revenue-relevant hours in that year, where revenue-relevant hours are conservatively defined as 12 hours per day to reflect periods of highest commercial link demand. Annual unavailability values are then averaged across all gateways, and the resulting gateway-level averages are finally averaged across the observed years to generate a multi-year estimate of mean gateway unavailability. Rainfall conditions at different gateways are treated as independent for purposes of this calculation. We apply hourly rain-fade thresholds of 15 mm/hr for the Ka-band, V-Band in the space-to-Earth direction, and 42 GHz band, 10 mm/hr for the V-Band in the Earth-to-space direction, and any measurable rainfall for the E-band.

[26] Novaspace, *Non-geostationary orbit constellations redefining the High Throughput Satellites market landscape* (Apr. 25, 2024), https://nova.space/press-release/non-geostationary-orbit-constellations-redefining-the-high-throughput-satellites-market-landscape/.

[27] The number of gateway stations only enters our analysis on a relative basis, so we do not report it here.

2025 had the *Report and Order* not been adopted.[28] Finally, as with the 12.7 GHz band, we relate this increase in capacity to industry analyst projections of the market value of U.S. satellite data services using the two methods discussed above. The following table summarize the valuations using *Method 1* and *Method 2*.

	Method 1		*Method 2*	
Band	**3% Discount**	**7% Discount**	**3% Discount**	**7% Discount**
12.7 GHz band	$3.7 billion	$3.2 billion	$521 million	$461 million
42 GHz band	$1.2 billion	$1.0 billion	$151 million	$133 million
Total	$4.8 billion	$4.2 billion	$672 million	$594 million

20. We note that modeling choices are intentionally conservative; we have not taken into account additional benefits that could increase both producer surplus and consumer surplus. For example, throughput is reduced by multi-year average unavailability based on band-specific rain thresholds and is computed over revenue-relevant hours, i.e., 12 hours per day instead of 24 hours, potentially overstating unavailability. Additionally, we have not sought to estimate potentially substantial benefits to GSO operators in bands where they will obtain primary allocations. This includes, for instance, GSO operators being able to use ESIMs in the Earth-to-space direction in much of the 12.7 GHz band or GSO operators being able to use gateway or feeder links in the space-to-Earth direction in the 42 GHz band. Together, such choices reduce the risk of overstating gains in capacity and, by extension, gains in producer-surplus. Moreover, we have not sought to estimate additional benefits of freeing up spectrum, such as that in the Ka-band, that is presently used by feeder links, but may be put to better uses.

21. *Terrestrial Services Valuation*. Above, we have derived two estimates of the value of the actions being adopted in this Report and Order. As a counterfactual to these actions, we now consider the value of using the spectrum in question for terrestrial services in order to assess the opportunity cost of using the spectrum to provide satellite-based services. We derive producer surplus gains for terrestrial services by estimating the incremental value of the spectrum in question using auction-based MHz-POPs benchmarks. This approach follows the economic logic that spectrum value reflects the present value of profits that can be earned services that rely on that spectrum.[29] In order to facilitate comparison to our valuation of satellite-based services above, we convert the computed auction values to perpetuities using corresponding discount rates (3% or 7%) and compute the present values for the first five years (i.e., 2026-2030).

22. For the 12.7 GHz and 42 GHz bands, we analyzed FCC auction data and selected an appropriate benchmark auction band as a proxy for estimating the incremental value of the included spectrum. For the 12.7 GHz band, we relied on Auction 101, which auctioned spectrum in the 27.50-

[28] We note that the number of gateways has increased over time and may continue to do so, such that our implicit assumption that the number of gateways remains fixed understates the increase in NGSO HTS capacity. Access to additional spectrum could reduce infrastructure investment by allowing satellite operators to serve their customers with fewer gateway stations. This would slow down the pace at which gateway stations are constructed, but also reduce costs.

[29] Coleman Bazelon & Giulia McHenry, *Mobile Broadband Spectrum: A Vital Resource for the U.S. Economy,* Brattle Group Report at 5, https://api.ctia.org/docs/default-source/default-document-library/brattle_spectrum_051115.pdf (2015). As a general matter, auction-based valuations may understate producer surplus because they do not account for information rents to the winning bidder—that is, the difference between the expected net present value of the winning bidder, and the actual auction payment that we observe. *See, e.g.,* Brett Katzman, Julian Reif, Jesse A. Schwartz, The Relation Between Variance and Information Rent in Auctions, 28 *International Journal of Industrial Organization* 127 (2010) ("[T]he expected price paid in a standard auction equals the expectation of the second-highest bidder value . . . whenever bidder beliefs are independent . . . The winning bidder's expected surplus is often referred to as *information rent*."); *see also* Roger B. Myerson, Optimal Auction Design, 6 Mathematics of Operations Research (1981).

28.35 GHz range.[30] Based on our calculations, Auction 101 yielded a MHz-POPs value of $0.0113. Applying this benchmark to the 12.7-13.25 GHz band produced an estimated spectrum value of approximately $2.13 billion.[31] For the 42 GHz band, we used Auction 103, which auctioned licenses in the 37 GHz, 39 GHz, and 47 GHz bands.[32] We applied the overall Auction 103 MHz-POPs value of $0.0071, generating an estimated spectrum value of approximately $1.22 billion.[33]

23. Because the auction valuations represent a stream of discounted future profits, in order to facilitate comparison with our valuation of satellite-based services, we must convert the auction value into a perpetuity at the 3% and 7% discount rates and then calculate the present value of the annual payment in the perpetuity over the period 2026-2030. Doing so yields the following present values:

Band	5-Year PV at 3% Discount	5-Year PV at 7% Discount
12.7 GHz band	$292 million	$611 million
42 GHz band	$167 million	$349 million
Total	$459 million	$960 million

24. We observe that, whereas the present values using a 7% discount rate are somewhat higher than those that we compute for satellite-based services using *Method 2*, they are well below the values computed using *Method 1* or the midpoint of the values computed using *Methods 1* and *2*.[34] In light of the fact that our conservative assumptions discussed above imply that we understate the producer surplus of satellite-based services, we find that it is unlikely that the spectrum would be put to better use for terrestrial service.[35]

25. Importantly, the rules we adopt today are also expected to generate increases in consumer surplus, but these are difficult to quantify. As satellite operators expand capacity and reduce costs, consumers should experience improved service quality, lower prices, and greater choice in consumer broadband and enterprise connectivity options. Expanded satellite access particularly benefits residents and businesses in areas where terrestrial networks are limited by geography or cost, thereby improving overall welfare and enabling broader participation in digital economic activity. Business customers—such as aviation, maritime, logistics, and cloud-based enterprises—may similarly benefit from enhanced reliability, higher throughput, and reduced latency.

26. Consumer welfare also increases through greater network resiliency and redundancy. By enabling more robust and diverse satellite-based connectivity, the proposal reduces the likelihood and cost

[30] *Auction 101: Spectrum Frontiers – 28 GHz*, https://www.fcc.gov/auction/101 (last visited Apr. 10, 2026).

[31] Our estimate is based on the product of the MHz-POPs value, the total spectrum auctioned, and the U.S. population: $2.11 billion = $0.0113 per MHz-POPs × 550 megahertz × 342,276,470 POPs. The U.S. population is based on the U.S. Census estimate for December 31, 2025. *U.S. and World Population Clock*, https://www.census.gov/popclock/ (last visited Apr. 10, 2026).

[32] *Auction 103: Spectrum Frontiers – Upper 37 GHz, 39 GHz, and 47 GHz*, https://www.fcc.gov/auction/103 (last visited Apr. 10, 2026).

[33] The estimate of $1.22 billion equals $0.0071 × 500 megahertz × 342,276,470 POPs.

[34] The 7% discount rate is generally treated as representing the average before-tax rate of return to private capital in the U.S. economy and is therefore more appropriate to use in the context of calculating the present value of a stream of profits. The White House, Circular A-4 (Sept. 17, 2003), https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4.

[35] We acknowledge that we have not calculated consumer surplus. However, consumer surplus from terrestrial services would have to be substantially higher than that which we expect would stem from the rules that we adopt in order for total surplus to be larger based on a midpoint between *Method 1* and *Method 2*.

of service disruptions during natural disasters, emergencies, or localized outages. These reliability improvements generate value that is not always reflected in prices but nonetheless contributes significantly to consumer surplus.

27. Finally, consumers benefit indirectly from the innovations stimulated by greater access to spectrum. As operators experiment with advanced antenna systems, multi-band architectures, and high throughput NGSO constellations, the resulting service improvements—higher speeds, expanded coverage, or new broadband features—create additional consumer benefits that, while difficult to quantify *ex ante*, represent meaningful welfare gains.

C. COSTS

28. We identify two broad categories of costs: (1) increases in expenditures needed to update existing infrastructure to incorporate access to the newly available bands and to serve a larger pool of customers, and (2) costs of complying with the revised rules. The analysis in the benefits section accounts for the category 1 costs—i.e., the costs to serve additional customers by multiplying estimated market value gains by an estimated profit margin. This amounts to subtracting incremental costs of serving new customers from incremental revenue. Moreover, because accounting profits encompass fixed costs, our approach takes into consideration potential costs to upgrade infrastructure to incorporate the additional spectrum bands. Although such costs may be higher up front, we do not have data that would allow us to isolate the timing with which fixed costs are incurred. Moreover, as we note above, access to additional spectrum could reduce infrastructure investment, and in doing so, reduce rather than increase costs.

29. With respect to category 2, we recognize that satellite operators that provide FSS would need to familiarize themselves with the revised rules. Familiarization costs result from work that regulatees wishing to take advantage of the revised rules need to perform to familiarize themselves with the rule revisions. We estimate familiarization costs by using needed labor hours worked by engineers and attorneys to make sure that satellite operators understand and comply with the new rules. Staff estimates that telecommunications aerospace engineers are compensated at a rate of $102.11/hour and telecommunications attorneys are compensated at $157.65/hour.[36] Staff estimates that 54 satellite operators may be impacted by our rules, and conservatively assume that all 54 will require familiarization with the rules.[37] For familiarization, Staff assumes reading and understanding the order will take 6 engineer hours of work and 2 lawyer hours of work for each regulatee, implying $50,000 of costs across regulatees in 2026.[38] Because these rules replace existing rules, future entrants would not be expected to incur additional familiarization costs because they would need to familiarize themselves with only one set of rules prior to entry.

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[36] The Bureau of Labor Statistics reports May 2025 hourly mean wages for aerospace engineers and lawyers in the telecommunications industry as $69.94/hour and $107.98/hour, respectively. Bureau of Labor Statistics (BLS), *Occupational Employment and Wage Statistics Query System*, https://data.bls.gov/oes/#/industry/517000 (accessed July 15, 2026). According to the Bureau of Labor Statistics, as of December 2025, civilian wages and salaries averaged $33.72/hour and benefits averaged $15.60/hour. Using these figures, benefits constitute a markup of $15.60/$33.72 ~ 46%. Taking 46% for cost of benefits, we arrive at an hourly compensation of $102.11/hour ($69.94/hour × $146%), and $157.65/hour ($107.98/hour × $146%), for engineers and attorneys, respectively. *See* Press Release, Bureau of Labor Statistics, Employer Costs for Employee Compensation—March 2026 (June 12, 2026), https://www.bls.gov/news.release/pdf/ecec.pdf (*Benefit Markup*).

[37] *Review of the Commission's Assessment and Collection of Regulatory Fees for Fiscal Year 2025; Assessment and Collection of Space and Earth Station Regulatory Fees for Fiscal Year 2025*, MD Docket Nos. 25-190, 24-85, Report and Order, 40 FCC Rcd 7557, 7605-07, Appx. E. This estimate is conservative because not all operators will choose to revise their operations to enable usage of the new spectrum.

[38] (6 hours of engineering work × $102.11/hour + 2 hours of legal work × $157.65) × 54 regulatees = $50,110) ~ $50,000.

D. ALTERNATIVE POLICIES

1. Alternative A – Limited or No Action

30. Under this alternative, the Commission would not increase the supply of satellite spectrum and would decline to open the 12.7 GHz band or the 42 GHz band for expanded satellite use. The consequence of taking no action is that each of these bands would remain constrained by existing allocations, footnotes, and usage patterns, which significantly limits their utility for satellite broadband and backhaul applications.

31. In the 12.7-13.25 GHz band, no action would limit access to 550 MHz of Ku-band spectrum in close proximity to other FSS and technically well suited for high throughput user-link operations. The band would remain underused due to siting and other restrictions that limit deployment of NGSO FSS earth stations. Without FSS downlinks and ESIMs, this band cannot effectively support additional satellite broadband competition.

32. In the 42 GHz band, a no-action approach would leave unused a 500 MHz band of greenfield, internationally harmonized spectrum that 20 NGSO FSS operators have sought authority to use.[39] Failure to allow satellite operations here would reduce the ability of U.S. operators to deploy high-capacity feeder links and user-links, limiting system scalability and putting U.S. constellations at a disadvantage relative to overseas competitors with access to similar high-frequency bands.

33. Collectively, these foregone opportunities mean that a limited- or no-action approach would perpetuate spectrum underutilization, constrain satellite system capacity, impede competition-driven broadband affordability improvements, and reduce the ability of satellite systems to complement terrestrial networks. For these reasons, this alternative remains inferior to the adopted rules.

2. Alternative B – Adopt Rules to Make Available 1,050 Megahertz of Spectrum in Spectrum Neighborhoods that are Ideal for Satellite Broadband

34. Under this alternative, the Commission would adopt rules that will unlock 1,050 megahertz of new satellite broadband spectrum, enabling operators to deploy higher-capacity networks, reduce capacity constraints, and support innovative next-generation NGSO architectures. These improvements will expand broadband availability, enhance service quality and reliability, and strengthen competition, particularly benefiting rural and remote communities that depend on satellite connectivity. By fostering increased investment, improving network scalability, and promoting U.S. leadership in advanced satellite technologies, this alternative delivers substantial economic and consumer welfare gains while maintaining appropriate protections for incumbent users.

3. Alternative C – Adopt Rules that Prioritize Terrestrial Services

35. Under this counterfactual alternative, the Commission would prioritize terrestrial services in the 12.7 GHz and 42 GHz bands. For each band, we find that doing so would lead to public interest benefits that are below those that would be possible under the rules that we adopt.

36. As commenters observe, in the 12.7 GHz band, sharing between fixed services and satellite operations is only feasible where earth stations are individually licensed and geographically separated, which is incompatible with the ubiquitous, blanket-licensed NGSO user terminals the Commission seeks to support.[40] FS transmissions in the same band and area would effectively preclude NGSO FSS downlinks, making terrestrial prioritization infeasible from an interference-management

[39] Comments of Kuiper Systems LLC, WT Docket No. 23-158 and GN Docket No. 14-177, at 1 (rec. Aug. 30, 2023) (Kuiper 42 GHz Comments).

[40] *See* Comments of CTIA, SB Docket No. 25-180, at 5-6 (filed July 28, 2025).

perspective.[41] In the 42 GHz band, the Commission finds that it is feasible to authorize FSS downlinks on a primary basis while still permitting terrestrial fixed services on a co-primary basis and protecting adjacent-band RAS operations, allowing both services to operate effectively and making more efficient overall use of the spectrum. Prioritizing terrestrial services would thus leave over 1,000 megahertz spectrum underutilized, perpetuate existing capacity constraints, and impede the development of high throughput satellite networks.

E. JUSTIFICATION DETERMINATION

1. Benefits Exceed Costs

37. We find that the rules adopted in this *Report and Order* will generate substantial benefits to the communications ecosystem and that these benefits outweigh the expected costs. By increasing the supply of satellite spectrum and enabling more intensive and efficient use of the 12.7 GHz and 42 GHz bands, the rules support measurable gains in producer surplus through enhanced capacity, improved operational efficiency, and expanded opportunities for innovation and investment. The rules also generate important, though unquantified, increases in consumer surplus by supporting more affordable broadband options, expanding service availability in high-cost or hard-to-serve areas, and strengthening the resiliency and performance of broadband networks through satellite-terrestrial complementarity.

38. In contrast, the associated compliance costs—while real—are relatively modest and largely limited to administrative and engineering burdens required to implement the new framework. These costs do not outweigh the long-run economic benefits generated by greater spectrum availability, increased competition, and improved network performance. Accordingly, we find that the benefits of the adopted rules exceed the costs.

Table of Benefits and Costs

		Present Value			
		Method 1		*Method 2*	
	Year	**3% Discount**	**7% Discount**	**3% Discount**	**7% Discount**
Quantifiable Benefits ($ Billions)	2026	$0.2	$0.2	$0.1	$0.1
	2027	$0.5	$0.5	$0.1	$0.1
	2028	$0.8	$0.8	$0.1	$0.1
	2029	$1.3	$1.1	$0.2	$0.1
	2030	$2.0	$1.6	$0.2	$0.1
	Total	$4.8	$4.2	$0.7	$0.6
Qualitative Benefits	*Consumer surplus, unquantified benefits to GSO operators, unquantified benefits from more efficient use of Ka-band*				
Quantifiable Costs ($ Thousands)	2026	$50	$50	$50	$50
	Total	$50	$50	$50	$50
Net Gain ($ Billions)	**Total**	$4.8	$4.2	$0.7	$0.6

2. Highest Net-Benefit Alternative

39. Based on the record and economic analysis, we find that Alternative B offers the greatest net benefit among the three alternatives considered. Although the opportunity cost of the terrestrial

[41] *See* SpaceX Comments at 2.

alternative calculated at a 7% discount rate is $960 million, which is higher than the quantitative estimate in our *Method 2* valuation at that discount rate, this is nonetheless well below the midpoint of our two alternative methodologies. Moreover, as we have discussed above, both *Method 1* and *Method 2* are based on conservative assumptions that leave out various benefits that we have discussed qualitatively. As such, we find that we will best serve the public interest by using the spectrum bands discussed in the *Report and Order* to enable satellite operators to expand high-capacity satellite broadband and backhaul, and in doing so, to improve the availability and quality of satellite services nationwide.