

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

In the Matter of
Use of Spectrum Bands Above 24 GHz For
Mobile Radio Services
GN Docket No. 14-177

FIFTH REPORT AND ORDER

Adopted: April 12, 2019

Released: April 15, 2019

By the Commission: Chairman Pai and Commissioners O’Rielly and Carr issuing separate statements;
Commissioners Rosenworcel and Starks approving in part, dissenting in part, and issuing separate
statements.

I. INTRODUCTION

1. Today, we take two actions that continue our efforts to make available millimeter wave
(mmW) spectrum, at or above 24 GHz, for fifth-generation (5G) wireless, Internet of Things, and other
advanced spectrum-based services, including satellite broadband services. First, we establish rules to
allow Fixed-Satellite Service (FSS) operators such as satellite broadband service operators, to operate
with individually licensed earth stations transmitting in the 50.4–51.4 GHz band using criteria identical to
those applicable in the 24.75–25.25 GHz band. This action will allow FSS operators to provide additional
capacity that can be used to provide faster and more advanced services to their customers. Second, we
establish a process for the Department of Defense (Department) to operate on a shared basis in the Upper
37 GHz band (37.6–38.6 GHz band) in limited circumstances. This action will provide certainty to
potential applicants as we begin the auction for the Upper 37 GHz band, the 39 GHz band (38.6–40 GHz
band), and the 47 GHz band (47.2–48.2 GHz) later this year.

II. BACKGROUND

2. On June 8, 2018, the Commission released the Third R&O, MO&O, and Third FNPRM
in this proceeding. In relevant parts, the Third FNPRM proposed permitting the licensing of individual
FSS earth stations in the 50.4–51.4 GHz band using criteria identical to those applicable in the 24.75–
25.25 GHz band. With respect to the 37 GHz band, the Commission noted that it had adopted rules that
establish coordination zones for 14 military sites and three scientific sites identified by the National
Telecommunications and Information Administration (NTIA), and it sought comment on “on how best to
accommodate coordination zones for future Federal operations at a limited number of additional sites.”

1 Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al., Fourth Report and Order, FCC 18-180
(rel. Dec. 12, 2018) (Fourth R&O).

2 Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al., Third Report and Order, Memorandum
Opinion and Order, and Third Further Notice of Proposed Rulemaking, 33 FCC Rcd 5576 (2018). When citing to
the Third Report and Order portion of the 2018 document, we will refer to the Third R&O. When citing to the
Memorandum Opinion and Order portion of the 2018 document, we will refer to the MO&O. When citing to the
Third Further Notice of Proposed Rulemaking portion of the 2018 document, we will refer to the Third FNPRM.

3 Third FNPRM, 33 FCC Rcd at 5610-12, paras. 92–94.

4 Third FNPRM, 33 FCC Rcd at 5605, para. 74.

In contrast, for the Lower 37 GHz band, the Commission sought comment on a proposed coordination mechanism and alternatives to facilitate co-equal shared use of the Lower 37 GHz band between Federal and non-Federal users, as well as among non-Federal users.⁵

3. The 50.4–51.4 GHz band includes primary Federal and non-Federal allocations for fixed and mobile services, as well as primary Federal and non-Federal allocations for fixed-satellite (Earth-to-space) and mobile satellite (Earth-to-space) services.⁶ In 1998, the Commission designated the 50.4–51.4 GHz band for use by wireless (fixed and mobile) services.⁷ In the *Spectrum Frontiers FNPRM*, the Commission proposed to authorize fixed and mobile operations throughout the 50.4–52.6 GHz band in accordance with the Part 30 Upper Microwave Flexible Use Service (UMFUS) rules.⁸ The Commission also proposed to use geographic area licensing to license UMFUS stations in the band on a PEA basis and sought comment on sharing with satellite services.⁹ The Commission received ten satellite applications or market access requests¹⁰ and twenty earth station applications¹¹ seeking to use the existing FSS (Earth-to-space) allocation in the 50.4–51.4 GHz band for delivery of broadband services.

4. In the *Third FNPRM*, the Commission proposed rules that would permit licensing of individual FSS earth stations in the 50.4–51.4 GHz band using criteria identical to those applicable in the 24.75–25.25 GHz band. Specifically, we proposed to apply the permitted aggregate population limits within the specified earth station PFD contour on a per-county basis, similar to the requirement in the 27.5–28.35 GHz band, and to adopt constraints on the number of permitted earth stations on both a per county and a per PEA basis. To reflect these requirements, we proposed to modify Section 25.136 of the Commission's rules to include the 50.4–51.4 GHz band. We also proposed to amend footnote NG65 to the U.S. Table of Allocations to include the 50.4–51.4 GHz band, making clear the relative interference protection obligations between the co-primary services.¹²

5. With respect to the Upper 37 GHz band, the entire 37 GHz band is allocated to the fixed and mobile services on a primary basis for Federal and non-Federal use.¹³ In the *Spectrum Frontiers R&O*, the Commission made five decisions addressing the Federal and non-Federal use of the band that are relevant here. First, it adopted service rules to permit non-Federal fixed and mobile terrestrial

⁵ *Third FNPRM* at paras. 58–73.

⁶ The Federal allocations are limited to military systems. See 47 CFR § 2.106 n.G117.

⁷ *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*, First Report and Order, 13 FCC Rcd 24649, 24651, para. 2 (1998).

⁸ *FNPRM*, 31 FCC Rcd at 8157, para. 420.

⁹ *Id.*

¹⁰ See IBFS File Nos. SAT-LOA-20160622-00058, as amended by IBFS File No. SAT-AMD-20170301-00030 (The Boeing Company); SAT-MOD-20160624-00060 and SAT-AMD-20170301-00026 (O3b Limited); SAT-LOI-20170301-00023 (Telesat Canada); SAT-LOI-20170301-00031 (WorldVu Satellites Limited (OneWeb)); SAT-LOA-20170301-00027 (Space Exploration Holdings, LLC (SpaceX)); SAT-LOA-20170301-00028 (The Boeing Company) (application for a separate system including both low-Earth orbit (LEO) and highly inclined orbit (NGSO) satellites); SAT-LOA-20161115-00112 and SAT-AMD-20170301-00029 (Theia Holdings A, Inc.); SAT-LOA-20161115-00117 (Audacy); SAT-LOA-20161115-00120 (ViaSat); and SAT-LOA-20170621-00092, as amended by SAT-AMD-20170908-00128 (Hughes Network Systems, LLC.).

¹¹ IBFS File Nos. SES-LIC-20170807-00876 through SES-LIC-20170807-00895.

¹² *Third FNPRM*, 33 FCC Rcd at 5610–12, paras. 92–94.

¹³ *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, 8057, para. 105 (2016) (*R&O*).

operation throughout the 37 GHz band.¹⁴ Second, it divided the band into two segments: a lower band segment from 37.0–37.6 GHz (Lower 37 GHz band) and an upper band segment from 37.6–38.6 GHz (Upper 37 GHz band).¹⁵ Third, it made the Lower 37 GHz band available for coordinated co-primary sharing between Federal and non-Federal users.¹⁶ Fourth, it adopted rules to license the upper 37 GHz band geographically by Partial Economic Areas (PEAs) in 200 megahertz channel blocks (but changed the band plan to 100 megahertz blocks in the *Spectrum Frontiers Fourth R&O*).¹⁷ Fifth, it established the coordination zones throughout the entire 37–38.6 GHz band for the 14 military sites and three scientific sites identified by NTIA.¹⁸ While the Commission noted that Federal agencies still had the ability to add future sites on a coordinated basis, it did not indicate how this could be done.¹⁹

6. In the *Third FNPRM*, the Commission sought comment on how best to accommodate coordination zones for future Federal operations at a limited number of additional sites. The Commission asked whether it should amend its rules to add more specific sites for Federal operations, or whether it should establish a process that would permit Federal entities in the future to identify a limited number of additional sites on an as-needed basis. The Commission also asked whether the coordination zones previously established in its rules might be reduced to better accommodate nearby non-Federal operations without adversely impacting Federal operations at those sites.²⁰

7. We received 26 comments and 17 reply comments on the *Third FNPRM*. A list of commenters, reply commenters, and parties filing *ex parte* submissions relating to the issues addressed in this *Fifth Report and Order* is contained in Appendix C.²¹ No petitions for reconsideration of the *Third R&O* were filed.²²

III. DISCUSSION

A. 50.4–51.4 GHz Band

8. AT&T, Boeing, EchoStar, SES, SpaceX, Telesat, TIA, and Viasat, support licensing of individual FSS earth stations in the 50.4–51.4 GHz band.²³ Although not specifically opposed to the idea of allowing earth stations to operate in the 50.4–51.4 GHz band, CTIA, Nokia, and T-Mobile argue that it is premature to adopt rules for sharing between terrestrial and FSS operations before UMFUS service rules are adopted. They urge the Commission to adopt UMFUS service rules either first or

¹⁴ *R&O*, 31 FCC Rcd at 8057, para. 105.

¹⁵ *R&O*, 31 FCC Rcd at 8059, para. 111.

¹⁶ *R&O*, 31 FCC Rcd at 8059, para. 111.

¹⁷ *R&O*, 31 FCC Rcd at 8059, 8062, paras. 111, 123. See also *Fourth R&O* at paras. 11–14.

¹⁸ *Third FNPRM*, 33 FCC Rcd at 5605, para. 74 citing *R&O*, 31 FCC Rcd at 8070–71, para. 149; 47 CFR § 30.205. See also Letter from Paige R. Atkins, Associate Administrator, Office of Spectrum Management, NTIA to Julius Knapp, Chief, Office of Engineering and Technology, FCC (July 12, 2016) (*2016 NTIA Letter*).

¹⁹ *Third FNPRM*, 33 FCC Rcd at 5605, para. 74 citing *R&O*, 31 FCC Rcd at 8070–71, para. 149; 47 CFR § 30.205.

²⁰ *Third FNPRM*, 33 FCC Rcd at 5605, para. 74.

²¹ When citing comments, we will use the short name of the commenter contained in Appendix C, followed by the words “Comments” or “Reply Comments.” Similarly, for *ex parte* filings, we will use the name of the commenter along with the date the *ex parte* was filed as listed in ECFS (this date may be different from the date on the actual *ex parte* letter).

²² This *Fifth Report and Order* will not resolve issues concerning the 26 GHz band, the Lower 37 GHz band, the 42 GHz band, or terrestrial use of the 50.4–52.6 GHz band. Those issues will be addressed in the future in this proceeding.

²³ AT&T Comments at 15–16; Boeing Comments at 2–6; EchoStar Comments at 5–6; SES Comments at 2; Telesat Reply Comments at 2–3; TIA Comments at 6–7; Viasat Comments at 2–4; SpaceX Comments at 1–6.

simultaneously.²⁴ In contrast, most satellite operators, asserting that there is no need to delay adopting FSS earth station sharing rules, point to workability in other bands, imminent plans for 50.4–51.4 GHz band satellite deployment, and the need to alleviate the current regulatory uncertainty, which the operators describe as debilitating, particularly given the high cost and long lead time involved in designing and building next-generation satellites.²⁵ EchoStar and Boeing further encourage the Commission not only to swiftly adopt the proposed rules, but also to proceed with processing pending earth station applications in this band conditioned upon the outcome of the proceeding.²⁶

9. With respect to the terms under which the 50.4–51.4 GHz band would be made available for individually licensed earth stations, there is a split between commenters who support using the same criteria applicable in the 24.75–25.25 GHz band and those who ask the Commission to adopt more permissive criteria. EchoStar, TIA, and AT&T support the criteria contained in the *Third FNPRM*, which would allow up to three earth station locations in a given county and a maximum of 15 earth station locations in a given Partial Economic Area (PEA).²⁷ AT&T, in addition, expressly opposes any relaxation in sharing criteria proposed in the *Third FNPRM*, asserting a lack of evidence and justification for disturbing the existing balance between services achieved by the rules introduced in other bands.²⁸ T-Mobile similarly cautions that the Commission should go no further than the current sharing framework adopted for the 24 GHz band, which it characterizes as a consistent approach across already allocated bands.²⁹ In contrast, Boeing, SES, SpaceX, and Telesat ask the Commission to adopt more permissive or flexible sharing criteria than the Commission proposed, and they assert that the shorter propagation distances of the 50.4–51.4 GHz band make it suitable for more robust sharing.³⁰ Similarly, Viasat supports individual licensing of earth stations in the 50.4–51.4 GHz band consistent with the more liberal sharing framework applicable in the 47.2–48.2 GHz band,³¹ and it further asks us to clarify that smaller earth stations may be permitted to operate in the 47.2–48.2 GHz and 50.4–51.4 GHz bands on a secondary basis with respect to terrestrial services.³² Other parties request that the Commission add an

²⁴ CTIA Comments at 14; Nokia Comments at 4; T-Mobile Reply Comments at 9–12.

²⁵ SES Reply Comments at 6–7; Boeing Reply Comments at 1–5; Viasat Reply Comments at 2; Telesat Reply Comments at 3; EchoStar Comments at 1–7.

²⁶ EchoStar Comments at 1–7; Boeing Reply Comments at 4.

²⁷ EchoStar Comments at 6; TIA Comments at 6–7.

²⁸ AT&T Comments at 15–16.

²⁹ T-Mobile Comments at 20.

³⁰ For instance, SES recommends that the “Commission eliminate the population coverage limits in areas with lower population density and remove the restriction on covering interstate highways and passenger railroads, which will permit deployment of services consistent with the propagation characteristics of this higher band.” SES Comments at 2. *See also* Boeing Comments at 2–5 (“[T]he Commission might retain the restrictions on affected populations that are maintained in Section 25.136(d)(ii) of the rules, but refrain from imposing the arguably redundant restriction of three earth stations per county and 15 earth stations per PEA.”); SpaceX Comments at 7 (“the Commission should recognize the different circumstances here and adopt the previous proposal by satellite operators to permit the PFD Contour of FSS earth stations in a given county to cover: (1) 0.1% of the population of a county with more than 600,000 residents, (2) 600 residents in a county with between 6,000 and 600,000 residents, and (3) 10% of the population in a county with fewer than 6,000 residents.”); Telesat Reply Comments at 4–5 (supporting SES proposal, or, in the alternative, the SpaceX proposal).

³¹ Viasat Comments at 5.

³² Viasat Reply Comments at 4.

allocation for FSS in the 51.4–52.4 GHz band.³³ CCA contends that we should not adopt rules that could prejudice future mobile use.³⁴

10. We adopt our proposal to permit licensing of individual FSS earth stations in the 50.4–51.4 GHz band using the criteria we adopted for the 24.75–25.25 GHz band. This action will allow FSS operators to provide faster and more advanced services to their customers. Under those criteria, there may be no more than three earth stations in the 50.4–51.4 GHz band in a county and no more than 15 earth stations in any PEA. The area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of greater than or equal to -77.6 dBm/m²/MHz, together with the similar area of any other earth station operating in the 50.4–51.4 GHz band in the same county, may not cover, in the aggregate, more than the amount of population specified below:

Population within the County where earth station is located	Maximum permitted aggregate population within -77.6 dBm/m²/MHz PFD contour of earth stations
Greater than 450,000	0.1 percent of population in county.
Between 6,000 and 450,000	450 people.
Fewer than 6,000	7.5 percent of population in county.

Furthermore, the area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to -77.6 dBm/m²/MHz may not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port. In addition, that area shall not cross any of the following types of roads, as defined in functional classification guidelines issued by the Federal Highway Administration: Interstate, Other Freeways and Expressways, or Other Principal Arterial.

11. Although the 50.4–52.6 GHz band remains under consideration for UMFUS licensing, establishing UMFUS service rules will require us to address issues concerning sharing with co-primary Federal services in the 50.4–52.6 GHz band, as well as protection of passive services in the adjacent 50.2–50.4 GHz and 52.6–54.25 GHz bands.³⁵ In the meantime, we note that a significant number of FSS operators seek to license space stations and earth stations in the band. As in the case of other bands shared between co-primary terrestrial and fixed-satellite services, (e.g., 24.75–25.25 GHz, 37.5–40 GHz and 47.2–48.2 GHz), we find that, where an FSS allocation already exists in the 50.4–51.4 GHz band, a limited number of individually licensed FSS earth stations can share the 50.4–51.4 GHz band with minimal impact on terrestrial operations in this band. Both the 24 GHz and 50 GHz bands are satellite uplink bands. As in the 24 GHz band, the limits we will impose on FSS earth stations in the 50 GHz band will “better provide FSS with additional capacity for satellite services while permitting substantial terrestrial use of the band.”³⁶ Throughout this proceeding, the Commission has sought to promote spectrum efficiency by permitting spectrum made available for UMFUS to be shared with other allocated services when possible. We recognize there are a significant number of pending FSS earth station applications for the 50.4–51.4 GHz band. We agree that operators in this co-primary service seeking to proceed with system development need this degree of regulatory certainty and should not have to wait while the more complex issues associated with UMFUS licensing are addressed and resolved. Thus, we adopt the proposed rules, which will facilitate sharing between FSS and UMFUS, while we continue to consider the rules for terrestrial operations in the band.

³³ Boeing Comments at 6; Viasat Comments at 5–6. In the *Third FNPRM* we noted that Boeing had petitioned for FSS access the 51.4–52.4 GHz band. We made clear however, that our proposal applied only to the 50.4–51.4 GHz band. *Third FNPRM*, 33 FCC Rcd at 5611–12, para. 94 & n.290.

³⁴ CCA Comments at 7.

³⁵ *FNPRM*, 31 FCC Rcd at 8158, para. 422.

³⁶ *Third R&O*, 33 FCC Rcd at 5585, para. 22.

12. At this time, we will not adopt any of the various proposals for increased flexibility for FSS earth station licensing.³⁷ We recognize the differences in propagation characteristics between the 50 GHz band and lower frequency bands,³⁸ but we conclude that, prior to the adoption of UMFUS licensing rules, it would be premature to extend FSS earth station flexibility beyond the more conservative limits adopted in the 24.75–25.25 GHz band. Accordingly, we modify section 25.136 of our rules to include the 50.4–51.4 GHz band, thereby applying the identical licensing criteria to these FSS earth stations as are applicable to those in the 24.75–25.25 GHz band. We also make a minor conforming modification to section 25.130(b)(4) to include this newly modified rule section in the list of rule sections with which FSS transmitting earth station applicants must comply when seeking authorization in bands shared with UMFUS.³⁹ In addition, we amend footnote NG65 to the U.S. Table of Allocations as proposed to include the 50.4–51.4 GHz band, making clear the relative interference protection obligations between the co-primary services.

B. Federal Sites in 37–38.6 GHz

13. In response to the *Third FNPRM*, NTIA, on behalf of the Department, has identified one additional Federal site in the Upper 37 GHz band beyond the 14 military sites and three scientific sites identified in the Commission’s rules.⁴⁰ Specifically, it requests a small coordination zone around Edwards Air Force Base to the south of Federal facilities in China Lake, California.⁴¹ In addition, NTIA requests the conversion into a single area of the four overlapping coordination zones currently listed in the Table under the China Lake site.⁴² NTIA indicates that these changes would simplify the Table to ensure sufficient protection is available for the Department’s operations in the China Lake coordination area, as well as ensuring sufficient protection for nearby Edwards Air Force Base, without impacting any Upper 37 GHz licensees’ access to the surrounding population centers in southern California. We amend the Table to consolidate the China Lake coordination zones and accommodate Edwards Air Force Base.

14. Further, the Department expects to deploy at additional sites in the future,⁴³ and the lower 37 GHz band (37.0–37.6 GHz) may not be sufficient. Because of our forthcoming plans to auction spectrum in this band before the end of the year and because failure to address possible coordination with Federal users could create uncertainty for potential non-Federal bidders in the auction for spectrum in the Upper 37 GHz band, we believe it critical to address these needs for coordination here.

15. We recognize that 5G and other advanced technologies will support a wide variety of applications, including applications that can be used by Federal users. Although the Commission’s rules identify the current military sites where licensees would be required to coordinate within a distance of 30 kilometers, the Department expects that there likely will be additional sites where it will need to use the

³⁷ Nor do we address Viasat’s request with regard to smaller earth station operation as this issue is beyond the scope of our proposal in the *Third FNPRM*.

³⁸ Radio signals in the 50 GHz band are more subject to attenuation from oxygen and water vapor than signals in the 24 GHz band. Thus, all other things being equal, radio signals in the 50 GHz band will not travel as far as signals in the 24 GHz band.

³⁹ We made a similar change to this rule in the *3rd R&O* to add the 24 GHz band. In the *Third FNPRM*, we proposed to adopt rules based on the rules adopted for the 24 GHz band. *Third FNPRM*, 33 FCC Rcd at 5611–12, para. 94.

⁴⁰ See 47 C.F.R. § 30.205.

⁴¹ See Letter from David J. Redl, Assistant Secretary for Communications and Information, Department of Commerce to Ajit Pai, Chairman, Federal Communications Commission (filed Apr. 11, 2019) (*NTIA Letter*) at 4 and Enclosure.

⁴² *Id.*

⁴³ *Id.* at 3.

band but the Department cannot specifically identify these other locations at this time.⁴⁴ Unlike the current sites where non-Federal licensees must coordinate with the Department of Defense, the Department seeks to coordinate its use of these additional sites with non-Federal licensees.

16. Accordingly, we establish a process that accommodates the military's needs, while protecting the interests of non-Federal licensees in the Upper 37 GHz spectrum band. The Department may submit requests for access to the Upper 37 GHz band for specific additional military bases and ranges, for the purpose of defense applications or national security. Such requests must include a justification regarding why the proposed operations could not be accommodated in the Lower 37 GHz band.⁴⁵ FCC staff will review the request to assess any potential impact on non-Federal licensees, contacting the potentially affected licensees and facilitating direct coordination with the Department and NTIA (including establishing a mechanism for appropriate notice to prospective future successors-in-interest to the affected licensees). The FCC will determine whether the request for access can be accommodated without creating a significant risk of harmful interference to current or planned deployments by potentially affected non-Federal licensees. NTIA would provide the applicable military departments any new or revised frequency assignments that are successfully coordinated.⁴⁶ We find that this process strikes a reasonable balance among the stakeholders.

17. We recognize the concerns of commenters that increasing the number of Federal sites in the Upper 37 GHz band, or establishing a process for future federal sites that lacks sufficient certainty, might negatively affect an auction of the Upper 37 GHz band and the value of the spectrum.⁴⁷ We nonetheless find that the process we adopt here addresses the need for greater certainty for bidders in an auction, especially given the technical characteristics and expected deployments in the Upper 37 GHz band. First, requests by the Department are likely to be relatively rare, as we anticipate that most such operations can be accommodated in the Lower 37 GHz band.⁴⁸ Second, military use, if it cannot be accommodated in the Lower 37 GHz band, will be limited to military bases and ranges, for the purpose of defense applications or national security, and most likely will be in remote areas. Third, the technical characteristics of operations in this region of the spectrum, marked by high path losses and use of advanced antennas and adaptive power control, can minimize any significant impact on licensees' operations. Fourth, as noted above, the FCC, after consultation with potentially affected licensees, NTIA, and the Department, will determine whether the request for access can be accommodated without creating a significant risk of harmful interference to current or planned deployments by potentially affected non-Federal licensees. Although commenters suggest that the Department's needs can be accommodated by secondary market transactions with non-Federal licensees, we do not find that it would be appropriate for secondary markets to be the sole mechanism for addressing future needs for defense and national security applications.⁴⁹ Moreover, the same argument that AT&T raises to support the likelihood of successful Department negotiations on the secondary market—that the Department already has the practical ability to control the deployment of facilities on its military bases and ranges—also supports the likelihood that, under the process described above, non-Federal licensees could successfully negotiate coordination

⁴⁴ *NTIA Letter at 3*. See also 47 C.F.R. § 30.205

⁴⁵ The Department is willing to limit its requests to operations that cannot be accommodated in the Lower 37 GHz band. *NTIA Letter at 4*.

⁴⁶ *NTIA Letter at 4*.

⁴⁷ AT&T Comments at 10–11; CTIA Comments at 14–16; T-Mobile Comments at 15–16; Ericsson Comments at 13. AT&T April 5 *Ex Parte*; CTIA April 5 *Ex Parte*; T-Mobile April 5 *Ex Parte*; Verizon April 4 *Ex Parte*.

⁴⁸ We are continuing discussions with the Department of Defense on how to effectuate usage of the Lower 37 GHz band, and we intend to take steps towards specifying rules for sharing the band within three months, including exploring whether giving priority access to military use of the 37.0–37.2 GHz band would facilitate usage of the Lower 37 GHz band.

⁴⁹ See *NTIA Letter at 4*.

agreements with the Department regarding access to the Upper 37 GHz band at such military sites. Accordingly, we believe that the process we establish will protect winning bidders from harmful interference while enabling the Department to carry out operations in the Upper 37 GHz band for specific additional military sites on a limited basis.

18. We disagree with T-Mobile's assertion that the process we establish for coordination of future Department access to the Upper 37 GHz band is inconsistent with the Administrative Procedure Act.⁵⁰ First, the Commission provided ample notice in the *Third FNPRM* for our decisions today. In the *Third FNPRM*, the Commission asked not only whether it should amend its rules to add more specific sites for Federal operations, but also whether it should establish a process that would permit Federal entities in the future to identify a limited number of additional sites on an as-needed basis.⁵¹ Second, T-Mobile's assertion that the process we adopt is arbitrary and capricious is based on a description that does not match the process we adopt today in light of the record generated and our need to balance competing objectives under section 309(j) of the Act.⁵² T-Mobile claims that "the proposed process would not include any guidelines for the location or number of additional military sites."⁵³ However, the process we adopt today is limited to specific locations, *i.e.*, military bases and ranges, limits requests solely for the purpose of defense applications or national security, and only in those instances where the Department can justify that its proposed operations cannot be accommodated in the Lower 37 GHz band.

19. In addition, we note that the Department and the wireless industry are working together to advance spectrum-based technologies through various collaborative efforts, such as their participation in the National Spectrum Consortium and engagement in the Defense Advanced Research Projects Agency Spectrum Collaboration Challenge. Further, the Department and the wireless industry are working together to coordinate operations across many frequency bands, such as in the 3.5 GHz band. We anticipate that those working relationships can facilitate successful coordination of operations in the 37 GHz band.

20. Finally, we note that the coordinates for the Socorro and White Sands coordination zones contained in Tables 2 and 3 of section 30.205(a) of the Commission's Rules were not correctly published in the *Federal Register*,⁵⁴ and as such were inconsistent with the coordinates adopted by the Commission in the *R&O*. This decision in the *R&O* was subject to prior notice and comment. We amend Tables 2 and 3 of section 30.205(a) to correct the coordinates to the coordinates contained in the *R&O*. To the extent necessary, we observe that we forego an additional notice-and-comment period as "impracticable, unnecessary, or contrary to the public interest."⁵⁵

IV. PROCEDURAL MATTERS

21. *Final Regulatory Flexibility Analysis.* The Regulatory Flexibility Act (RFA)⁵⁶ 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

⁵⁰ T-Mobile May 9 *Ex Parte* at 3–5.

⁵¹ *Third FNPRM*, 33 FCC Rcd at 5605, para. 74.

⁵² The statutory factors we promote here include, *e.g.*, "development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas, without administrative or judicial delays;" and "efficient and intensive use of the electromagnetic spectrum . . ." See 47 U.S.C. § 309(j).

⁵³ T-Mobile May 9 *Ex Parte* at 5.

⁵⁴ 47 CFR § 30.205(a), Tables 2 and 3.

⁵⁵ 5 U.S.C. § 553(b)(3)(B).

⁵⁶ See 5 U.S.C. § 601–612. The RFA has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

substantial number of small entities.”⁵⁷ Accordingly, we have prepared a Final Regulatory Flexibility Analysis concerning the possible impact of the rule changes contained in this *Fifth Report and Order* on small entities. The Final Regulatory Flexibility Analysis is set forth in Appendix B.

22. *Paperwork Reduction Act.* The requirements in revised section 25.136 (e), (f), and (g) constitute new or modified collections subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. They will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new information collection requirements contained in this proceeding. This document will be submitted to OMB for review under section 3507(d) of the PRA. In addition, we note that, pursuant to the Small Business Paperwork Relief Act of 2002, we previously sought, but did not receive, specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees. We describe impacts that might affect small businesses, which includes more businesses with fewer than 25 employees, in the Final Regulatory Flexibility Analysis in Appendix B.

23. In this present document, we have assessed the effects of our filing requirements on satellite providers and find that these requirements will not impose undue burdens on businesses with fewer than 25 employees. The filing requirements we are imposing are necessary to ensure that the proposed operations will comply with the technical rules we have established and not unduly preclude possible future terrestrial operation in the band.

24. *Further Information.* For further information, contact John Schauble of the Wireless Telecommunications Bureau, Broadband Division, at 202-418-0797 or John.Schauble@fcc.gov, Michael Ha of the Office of Engineering and Technology, Policy and Rules Division, at 202-418-2099 or Michael.Ha@fcc.gov, or Jose Albuquerque of the International Bureau, Satellite Division, at 202-418-2288 or Jose.Albuquerque@fcc.gov.

⁵⁷ 5 U.S.C. § 605(b).

V. ORDERING CLAUSES

25. Accordingly, IT IS ORDERED, pursuant to Sections 1, 2, 3, 4, 5, 7, 301, 302, 302a, 303, 304, 307, 309, and 310 of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 153, 154, 155, 157, 301, 302, 302a, 303, 304, 307, 309, and 310, section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302, and section 1.411 of the Commission's Rules, 47 CFR § 1.411, that this *Fifth Report and Order* IS HEREBY ADOPTED.

26. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Fifth Report and Order*, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

27. IT IS FURTHER ORDERED that the amendments of the Commission's rules as set forth in Appendix A ARE ADOPTED, effective thirty days from the date of publication in the Federal Register. Section 25.136, paragraphs (e), (f), and (g) contain new or modified information collection requirements that require review by OMB under the PRA. The Commission directs the Bureau to announce the compliance date for those information collections in a document published in the Federal Register after OMB approval and directs the Bureau to cause section 25.136(h) to be revised accordingly.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A**Final Rules**

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 2, 25, and 30 as follows:

RULES AND REGULATIONS

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

[INSERT CURRENT AUTHORITY CITATION]

2. In § 2.106, the Table of Frequency Allocations is amended as follows:
 - a. Revise page 60.
 - b. In the list of non-Federal Government (NG) Footnotes, footnote NG65 is revised.

§ 2.106 Table of Frequency Allocations.

The revisions read as follows:

* * * * *

<p>50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) 5.338A MOBILE Mobile-satellite (Earth-to-space)</p>	<p>50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) US156 MOBILE MOBILE-SATELLITE (Earth-to-space) G117</p>	<p>50.4-51.4 FIXED FIXED-SATELLITE (Earth-to-space) US156 MOBILE MOBILE-SATELLITE (Earth-to-space) NG65</p>	<p>Satellite Communications (25)</p>
<p>51.4-52.6 FIXED 5.338A MOBILE 5.547 5.556</p>	<p>51.4-52.6 FIXED US157 MOBILE</p>		
<p>52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556</p>	<p>52.6-54.25 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) US246</p>		
<p>54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive) 5.556B</p>	<p>54.25-55.78 EARTH EXPLORATION-SATELLITE (passive) INTER-SATELLITE 5.556A SPACE RESEARCH (passive)</p>	<p>Satellite Communications (25)</p>	
<p>55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED 5.557A INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557</p>	<p>55.78-56.9 EARTH EXPLORATION-SATELLITE (passive) FIXED US379 INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) US353 US532</p>		
<p>56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.558A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557</p>	<p>56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE G128 MOBILE 5.558 SPACE RESEARCH (passive) US532</p>	<p>56.9-57 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE 5.558 SPACE RESEARCH (passive) US532</p>	
<p>57-58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) 5.547 5.557</p>	<p>57-58.2 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE 5.556A MOBILE 5.558 SPACE RESEARCH (passive) US532</p>	<p>RF Devices (15) Satellite Communications (25)</p>	
<p>58.2-59 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) 5.547 5.556</p>	<p>58.2-59 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) US353 US354</p>	<p>RF Devices (15)</p>	

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

* * * * *

NG65 In the bands 24.75-25.25 GHz, 47.2-48.2 GHz, and 50.4-51.4 GHz, stations in the fixed and mobile services may not claim protection from individually licensed earth stations authorized pursuant to 47 CFR 25.136. However, nothing in this footnote shall limit the right of Upper Microwave Flexible Use Service licensees to operate in conformance with the technical rules contained in 47 CFR part 30. The Commission reserves the right to monitor developments and to undertake further action concerning interference between Upper Microwave Flexible Use Service and Fixed-Satellite Service, including aggregate interference to satellite receivers, if appropriate.

* * * * *

PART 25 – SATELLITE COMMUNICATIONS

1. The authority citation for part 25 is revised to read as follows:

[INSERT CURRENT AUTHORITY CITATION]

2. Amend § 25.130 by revising paragraph (b)(4) to read as follows:

§ 25.130 Filing requirements for transmitting earth stations.

* * * * *

(b) * * *

(4) Applicants for earth stations licensed in accordance with §25.136 must demonstrate that the transmitting earth stations will meet the relevant criteria specified in that section, including any showings required under §25.136(a)(4), (c), (d)(4), and/or (e)(4).

* * * * *

3. Amend § 25.136 by revising the section heading and paragraphs (e), (f), and (g), and adding paragraph (h) to read as follows:

§ 25.136 Earth Stations in the 24.75-25.25 GHz, 27.5-28.35 GHz, 37.5-40 GHz, 47.2-48.2, GHz and 50.4-51.4 GHz bands.

* * * * *

(e) Notwithstanding that FSS is co-primary with the Upper Microwave Flexible Use Service in the 24.75-25.25 GHz and 50.4-51.4 GHz bands, earth stations in these bands shall be limited to individually licensed earth stations. An applicant for a license for a transmitting earth station in the 24.75-25.25 GHz or 50.4-51.4 GHz band must meet one of the following criteria to be authorized to operate without providing any additional interference protection to stations in the Upper Microwave Flexible Use Service:

(1) The FSS licensee also holds the relevant Upper Microwave Flexible Use Service license(s) for the area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of greater than or equal to $-77.6\text{dBm/m}^2/\text{MHz}$;

(2) The earth station in the 24.75-25.25 GHz band was authorized prior to August 20, 2018; or the earth station in the 50.4-51.4 GHz band was authorized prior to **[effective date of this rule]**; or

(3) The application for the earth station in the 24.75-25.25 GHz band was filed prior to August 20, 2018; or the application for the earth station in the 50.4-51.4 GHz band was filed prior to **[effective date of this rule]**; or

(4) The applicant demonstrates compliance with all of the following criteria in its application:

(i) There are no more than two other authorized earth stations operating in the same frequency band within the county where the proposed earth station is located that meet the criteria contained in either paragraphs (e)(1), (e)(2), (e)(3), or (e)(4) of this section, and there are no more than 14 other authorized earth stations operating in the same frequency band within the Partial Economic Area where the proposed earth station is located that meet the criteria contained in paragraphs (e)(1), (e)(2), (e)(3), or (e)(4) of this section. For purposes of this requirement, multiple earth stations that are collocated with or at a location contiguous to each other shall be considered as one earth station;

(ii) The area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of greater than or equal to $-77.6\text{ dBm/m}^2/\text{MHz}$, together with the similar area of any other earth station operating in the same frequency band authorized pursuant to paragraph (e) of this section, does not cover, in the aggregate, more than the amount of population of the county within which the earth

station is located as noted below:

Table 1 to Paragraph (e)(4)(ii)

Population within the County where earth station is located	Maximum permitted aggregate population within -77.6 dBm/m ² /MHz PFD contour of earth stations
Greater than 450,000	0.1 percent of population in county.
Between 6,000 and 450,000	450 people.
Fewer than 6,000	7.5 percent of population in county.

(iii) The area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to -77.6 dBm/m²/MHz does not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port. In addition, the area mentioned in paragraph (e)(4)(ii) of this section shall not cross any of the following types of roads, as defined in functional classification guidelines issued by the Federal Highway Administration pursuant to 23 CFR 470.105(b): Interstate, Other Freeways and Expressways, or Other Principal Arterial. The Federal Highway Administration Office of Planning, Environment, and Realty Executive Geographic Information System (HEPGIS) map contains information on the classification of roads. For purposes of this rule, an urban area shall be an Adjusted Urban Area as defined in section 101(a)(37) of Title 21 of the United States Code.

(iv) The applicant has successfully completed frequency coordination with the UMFUS licensees within the area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to -77.6 dBm/m²/MHz with respect to existing facilities constructed and in operation by the UMFUS licensee. In coordinating with UMFUS licensees, the applicant shall use the applicable processes contained in §101.103(d) of this chapter.

(f) If an earth station applicant or licensee in the 24.75-25.25 GHz, 27.5-28.35 GHz, 37.5-40 GHz, 47.2-48.2 GHz and/or 50.4-51.4 GHz bands enters into an agreement with an UMFUS licensee, their operations shall be governed by that agreement, except to the extent that the agreement is

inconsistent with the Commission's rules or the Communications Act.

(g) Any earth station authorizations issued pursuant to paragraph (a)(4), (c), (d)(4), or (e)(4) of this section shall be conditioned upon operation being in compliance with the criteria contained in the applicable paragraph.

(h) Compliance date. Paragraphs (e), (f), and (g) of this section contain new or modified information-collection and recordkeeping requirements adopted in FCC 19-XX. Compliance with these information-collection and recordkeeping requirements will not be required until after approval by the Office of Management and Budget. The Commission will publish a document in the Federal Register announcing that compliance date and revising this paragraph accordingly.

* * * * *

PART 30 – UPPER MICROWAVE FLEXIBLE USE SERVICE

5. The authority citation for part 30 continues to read as follows:

[INSERT CURRENT AUTHORITY CITATION]

6. Amend § 30.205 by revising paragraph (a) Tables 2 and 3 to read as follows:

§ 30.205 Federal coordination requirements.

(a) ***

Table 2: Socorro, New Mexico Coordination Zone

60 dBm/100 MHz EIRP		75 dBm/100 MHz EIRP
Latitude/Longitude (decimal degrees)	Latitude/Longitude (decimal degrees)	Latitude/Longitude (decimal degrees)
34.83816/-107.66828	33.44401/-108.67876	33.10651/-108.19320
34.80070/-107.68759	33.57963/-107.79895	33.11780/-107.99980
34.56506/-107.70233	33.84552/-107.60207	33.13558/-107.85611
34.40826/-107.71489	33.85964/-107.51915	33.80383/-107.16520
34.31013/-107.88349	33.86479/-107.17223	33.94554/-107.15516
34.24067/-107.96059	33.94779/-107.15038	33.95665/-107.15480
34.10278/-108.23166	34.11122/-107.18132	34.08156/-107.18137
34.07442/-108.30646	34.15203/-107.39035	34.10646/-107.18938
34.01447/-108.31694	34.29643/-107.51071	35.24269/-107.67969
33.86740/-108.48706	34.83816/-107.66828	34.06647/-108.70438
33.81660/-108.51052		33.35946/-108.68902
33.67909/-108.58750		33.29430/-108.65004

33.50223/-108.65470	33.10651/-108.19320
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Table 3: White Sands, New Mexico Coordination Zone

60 dBm/100 MHz EIRP		75 dBm/100 MHz EIRP	
Latitude/Longitude (decimal degrees)	Latitude/Longitude (decimal degrees)	Latitude/Longitude (decimal degrees)	Latitude/Longitude (decimal degrees)
33.98689/-107.15967	31.78455/-106.54058	31.7494/-106.49132	32.88382/-108.16588
33.91573/-107.46301	32.24710/-106.56114	32.24524/-106.56507	32.76255/-108.05679
33.73122/-107.73585	32.67731/-106.53681	32.67731/-106.53681	32.56863/-108.43999
33.37098/-107.84333	32.89856/-106.56882	32.89856/-106.56882	32.48991/-108.50032
33.25424/-107.86409	33.24323/-106.70094	33.04880/-106.62309	32.39142/-108.48959
33.19808/-107.89673	33.98689/-107.15967	33.21824/-106.68992	31.63664/-108.40480
33.02128/-107.87226		33.24347/-106.70165	31.63466/-108.20921
32.47747/-107.77963		34.00708/-107.08652	31.78374/-108.20798
32.31543/-108.16101		34.04967/-107.17524	31.78322/-106.52825
31.79429/-107.88616		33.83491/-107.85971	31.7494/-106.49132

(b) * * *

Table - Coordination Areas for Federal Terrestrial Systems

Location	Agency	Coordination Area (Decimal Degrees)
China Lake, CA	Navy	50 kilometer radius centered on latitude 35.614781 and longitude -117.454309
* * *		
White Sands Missile Range, NM	Army	30 kilometer radius centered on latitude 33.35 and longitude -106.3
Edwards AFB, CA	Air Force	20 kilometer radius centered on latitude 34.922905 and longitude -117.891219
Moody Air Force Base, GA	Air Force	30 kilometer radius centered on latitude 30.96694 and longitude -83.185
* * * * *		

(c) In addition to the locations listed in the table to paragraph (b) of this section, requests may be submitted to the Commission for access to the 37.6-38.6 GHz band for specific additional military bases and ranges for the purpose of defense applications or national security when the proposed military operations cannot be accommodated in the 37-37.6 GHz band.

APPENDIX B

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Third Further Notice of Proposed Rulemaking (Third FNPRM)* released in June 2018 in this proceeding.² The Commission sought written public comment on the proposals in the *3rd FNPRM*, including comments on the IRFA. No comments were filed addressing the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.³

A. Need for, and Objectives of, the Fifth Report and Order

2. In the attached *Fifth Report and Order*, the Commission authorizes Fixed-Satellite Service (FSS) use of the 50.4-51.4 GHz band for individually licensed earth stations, which will allow FSS operators to provide additional capacity that can be used to provide faster and more advanced services to their customers. In authorizing FSS use of the 50.4-51.4 GHz band for individually licensed earth stations, we will apply the licensing criteria we adopted for the 24.75-25.25 GHz band. Accordingly, in the *Fifth Report and Order* we modify Section 25.136 of our rules to include the 50.4-51.4 GHz band and make a minor conforming modification to Section 25.130(b)(4) to include this newly modified rule section in the list of rules sections that FSS transmitting earth station applicants must comply with when seeking authorization in bands shared with UMFUS. Additionally, we amend footnote NG65 to the U.S. Table of Allocations as proposed to include the 50.4-51.4 GHz band, making clear the relative interference protection obligations between the co-primary services.

3. With regard to Federal use in the 37 GHz band, the Commission establishes a process that accommodates the military's needs, while protecting the interests of non-Federal licensees in the Upper 37 GHz spectrum band. The Department of Defense may submit requests for access to the Upper 37 GHz band for specific additional military sites, such as military bases and ranges. Such requests must include a justification regarding why the proposed operations could not be accommodated in the Lower 37 GHz band. The FCC will review the request to assess any potential impact on non-Federal licensees, contacting the potentially affected licensees and facilitating direct coordination with the Department and NTIA (including establishing a mechanism for appropriate notice to prospective future successors-in-interest to the affected licensees). The FCC will determine whether the request for access can be accommodated without creating a significant risk of harmful interference to current or planned deployments by potentially affected non-Federal licensees. This action will accommodate military needs while providing certainty to potential applicants as we begin the auction process for the Upper 37 GHz band, the 39 GHz band (38.6-40 GHz band), and the 47 GHz band (47.2-48.2 GHz) later this year.⁴

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

4. There were no comments filed that specifically addressed the proposed rules and policies presented in the IRFA.

¹ See 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601–612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, (SBREFA) Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, FCC 18-73 (rel. June 8, 2018).

³ See 5 U.S.C. § 604.

⁴ *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Fourth Report and Order, FCC 18-180 (rel. Dec. 12, 2018) (*Spectrum Frontiers Fourth R&O*).

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

5. Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments.⁵

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 Proposed Rules Will Apply

7. The RFA requires the Commission to describe and to estimate the number of small entities that may be affected by the rules adopted herein.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 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

8. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three broad groups of small entities that could be directly affected herein.¹⁰ First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA’s Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.¹¹ These types of small businesses represent 99.9% of all businesses in the United States which translates to 28.8 million businesses.¹²

9. Next, the type of small entity described as a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”¹³ Nationwide, as of August 2016, there were approximately 356,494 small organizations based on registration and tax data filed by nonprofits with the Internal Revenue Service (IRS).¹⁴

⁵ 5 U.S.C. § 604(a)(3).

⁶ *Id.*

⁷ 5 U.S.C. § 601(6).

⁸ 5 U.S.C. § 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.”

⁹ 15 U.S.C. § 632.

¹⁰ *See* 5 U.S.C. § 601(3)–(6).

¹¹ *See* SBA, Office of Advocacy, “Frequently Asked Questions, Question 1 – What is a small business?” https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf (June 2016)

¹² *See* SBA, Office of Advocacy, “Frequently Asked Questions, Question 2- How many small businesses are there in the U.S.?” https://www.sba.gov/sites/default/files/advocacy/SB-FAQ-2016_WEB.pdf (June 2016).

¹³ 5 U.S.C. § 601(4).

¹⁴ Data from the Urban Institute, National Center for Charitable Statistics (NCCS) reporting on nonprofit organizations registered with the IRS was used to estimate the number of small organizations. Reports generated

(continued....)

10. Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”¹⁵ U.S. Census Bureau data from the 2012 Census of Governments¹⁶ indicate that there were 90,056 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.¹⁷ Of this number there were 37, 132 General purpose governments (county¹⁸, municipal and town or township¹⁹) with populations of less than 50,000 and 12,184 Special purpose governments (independent school districts²⁰ and special districts²¹) with populations of less than 50,000. The 2012 U.S. Census Bureau data for most types of governments in the local government category show that the majority of these governments have populations of less than 50,000.²² Based on this data we estimate that at least 49,316 local government jurisdictions fall in the category of “small governmental jurisdictions.”²³

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using the NCCS online database indicated that as of August 2016 there were 356,494 registered nonprofits with total revenues of less than \$100,000. Of this number, 326,897 entities filed tax returns with 65,113 registered nonprofits reporting total revenues of \$50,000 or less on the IRS Form 990-N for Small Exempt Organizations and 261,784 nonprofits reporting total revenues of \$100,000 or less on some other version of the IRS Form 990 within 24 months of the August 2016 data release date. See <http://nccs.urban.org/sites/all/nccs-archive/html/tablewiz/tw.php> where the report showing this data can be generated by selecting the following data fields: Report: “The Number and Finances of All Registered 501(c) Nonprofits”; Show: “Registered Nonprofits”; By: “Total Revenue Level (years 1995, Aug to 2016, Aug)”; and For: “2016, Aug” then selecting “Show Results”.

¹⁵ 5 U.S.C. § 601(5).

¹⁶ See 13 U.S.C. § 161. The Census of Government is conducted every five (5) years compiling data for years ending with “2” and “7”. See also Program Description Census of Government <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=program&id=program.en.CO.G#>.

¹⁷ See U.S. Census Bureau, 2012 Census of Governments, Local Governments by Type and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG02.US01>. Local governmental jurisdictions are classified in two categories - General purpose governments (county, municipal and town or township) and Special purpose governments (special districts and independent school districts).

¹⁸ See U.S. Census Bureau, 2012 Census of Governments, County Governments by Population-Size Group and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG06.US01>. There were 2,114 county governments with populations less than 50,000.

¹⁹ See U.S. Census Bureau, 2012 Census of Governments, Subcounty General-Purpose Governments by Population-Size Group and State: 2012 - United States – States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG07.US01>. There were 18,811 municipal and 16,207 town and township governments with populations less than 50,000.

²⁰ See U.S. Census Bureau, 2012 Census of Governments, Elementary and Secondary School Systems by Enrollment-Size Group and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG11.US01>. There were 12,184 independent school districts with enrollment populations less than 50,000.

²¹ See U.S. Census Bureau, 2012 Census of Governments, Special District Governments by Function and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG09.US01>. [The U.S. Census Bureau data did not provide a population breakout for special district governments.](#)

²² See U.S. Census Bureau, 2012 Census of Governments, County Governments by Population-Size Group and State: 2012 - United States-States - <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG06.US01>; Subcounty General-Purpose Governments by Population-Size Group and State: 2012 - United States-States - <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG07.US01>; and Elementary and Secondary School Systems by Enrollment-Size Group and State: 2012 - United States-States. <https://factfinder.census.gov/bkmk/table/1.0/en/COG/2012/ORG11.US01>. [While U.S. Census Bureau data did not provide a population breakout for special district governments, if the population of less than 50,000 for this category](#)

(continued....)

11. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services.²⁴ The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.²⁵ For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.²⁶ Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1,000 employees or more.²⁷ Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

12. *Fixed Microwave Services*. Microwave services include common carrier,²⁸ private-operational fixed,²⁹ and broadcast auxiliary radio services.³⁰ They also include the Upper Microwave Flexible Use Service,³¹ the Millimeter Wave Service,³² Local Multipoint Distribution Service (LMDS),³³ the Digital Electronic Message Service (DEMS),³⁴ and the 24 GHz Service,³⁵ where licensees can choose between common carrier and non-common carrier status.³⁶ At present, there are approximately 66,680 common carrier fixed licensees, 69,360 private and public safety operational-fixed licensees, 20,150 broadcast auxiliary radio licensees, 411 LMDS licenses, 33 24 GHz DEMS licenses, 777 39 GHz

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[of local government is consistent with the other types of local governments the majority of the 38, 266 special district governments have populations of less than 50,000.](#)

²³ *Id.*

²⁴ NAICS Code 517210. See <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.517210>.

²⁵ 13 CFR § 121.201, NAICS code 517210.

²⁶ U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ5, Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012 NAICS Code 517210 (rel. Jan. 8, 2016). https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ5/naics~517210.

²⁷ *Id.* Available census data does not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “1000 employees or more.”

²⁸ See 47 CFR Part 10, Subpart I.

²⁹ Persons eligible under Parts 80 and 90 of the Commission’s rules can use Private-Operational Fixed Microwave services. See 47 CFR Parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee’s commercial, industrial, or safety operations.

³⁰ Auxiliary Microwave Service is governed by Part 74 and Part 78 of Title 47 of the Commission’s rules. Available to licensees of broadcast stations, cable operators, and to broadcast and cable network entities. Auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes TV pickup and CARS pickup, which relay signals from a remote location back to the studio.

³¹ See 47 CFR Part 30.

³² See 47 CFR Part 101, Subpart Q.

³³ See 47 CFR Part 101, Subpart L.

³⁴ See 47 CFR Part 101, Subpart G.

³⁵ See *id.*

³⁶ See 47 CFR §§ 30.6, 101.1017.

licenses, and five 24 GHz licensees, and 467 Millimeter Wave licenses in the microwave services.³⁷ The Commission has not yet defined a small business with respect to microwave services. The closest applicable SBA category is Wireless Telecommunications Carriers (except Satellite) and the appropriate size standard for this category under SBA rules is that such a business is small if it has 1,500 or fewer employees.³⁸ For this industry, U.S. Census Bureau data for 2012 shows that there were 967 firms that operated for the entire year. Of this total, 955 had employment of 999 or fewer, and 12 firms had employment of 1,000 employees or more.³⁹ Thus under this SBA category and the associated standard, the Commission estimates that the majority of fixed microwave service licensees can be considered small.

13. The Commission does not have data specifying the number of these licensees that have more than 1,500 employees, and thus is unable at this time to estimate with greater precision the number of fixed microwave service licensees that would qualify as small business concerns under the SBA's small business size standard. Consequently, the Commission estimates that there are up to 36,708 common carrier fixed licensees and up to 59,291 private operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services that may be small and may be affected by the rules and policies adopted herein. We note, however, that both the common carrier microwave fixed and the private operational microwave fixed licensee categories includes some large entities.

14. *Satellite Telecommunications.* This category comprises firms "primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications."⁴⁰ Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of \$32.5 million or less in average annual receipts, under SBA rules.⁴¹ For this category, U.S. Census Bureau data for 2012 shows that there were a total of 333 firms that operated for the entire year.⁴² Of this total, 299 firms had annual receipts of less than \$25 million.⁴³ Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

15. *All Other Telecommunications.* The "All Other Telecommunications" category is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation.⁴⁴ This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems.⁴⁵ Establishments providing Internet services or

³⁷ These statistics are based on a review of the Universal Licensing System on September 22, 2015.

³⁸ 13 CFR § 121.201, NAICS code 517210.

³⁹ *Id.* Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with "1000 employees or more."

⁴⁰ U.S. Census Bureau, 2012 NAICS Definitions, "517410 Satellite Telecommunications", <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en/ECN.NAICS2012.517410#>.

⁴¹ 13 CFR § 121.201, NAICS code 517410.

⁴² U.S. Census Bureau, 2012 *Economic Census of the United States*, Table EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 517410 https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4/naics~517410.

⁴³ *Id.*

⁴⁴ See U.S. Census Bureau, 2012 NAICS Definitions, NAICS Code "517919 All Other Telecommunications", <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en/ECN.NAICS2012.517919#>.

⁴⁵ *Id.*

voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.”⁴⁶ The SBA has developed a small business size standard for “All Other Telecommunications,” which consists of all such firms with gross annual receipts of \$32.5 million or less.⁴⁷ For this category, U.S. Census Bureau data for 2012 shows that there were a total of 1,442 firms that operated for the entire year.⁴⁸ Of these firms, a total of 1400 firms had gross annual receipts of under \$25 million and 42 firms had gross annual receipts of \$25 million to \$49, 999,999.⁴⁹ Thus, the Commission estimates that a majority of “All Other Telecommunications” firms potentially affected by our actions can be considered small.

16. *Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.* This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment.⁵⁰ Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment.”⁵¹ The SBA has established a size standard for this industry of 1,250 employees or less.⁵² U.S. Census Bureau data for 2012 shows that 841 establishments operated in this industry in that year.⁵³ Of that number, 828 establishments operated with fewer than 1,000 employees, 7 establishments operated with between 1,000 and 2,499 employees and 6 establishments operated with 2,500 or more employees.⁵⁴ Based on this data, we conclude that a majority of manufacturers in this industry is small.

E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

17. We expect the rules adopted in the *Fifth Report and Order* will impose new or additional reporting or recordkeeping and/or other compliance obligations on small entities as well as other applicants and licensees. FSS earth station applicants and licensees in the 50.4-51.4 GHz band will be subject to the reporting, recordkeeping, and compliance requirements applicable in the 24.75-25.25 GHz band.⁵⁵ When they submit applications for authority to operate earth stations in the 50.4-51.4 GHz band,

⁴⁶ *Id.*

⁴⁷ 13 CFR 121.201; NAICS Code 517919.

⁴⁸ U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSSZ4, Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012, NAICS code 517919, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/51SSSZ4//naics~517919.

⁴⁹ *Id.*

⁵⁰ The NAICS Code for this service is 334220. 13 C.F.R 121.201. *See also* U.S. Census Bureau, 2012 NAICS Definitions, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing” <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.334220#>.

⁵¹ *See* U.S. Census Bureau, 2012 NAICS Definitions, NAICS Code 334220, available at <https://factfinder.census.gov/faces/affhelp/jsf/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012.334220#>.

⁵² 13 CFR § 121.201, NAICS Code 334220.

⁵³ U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1231SG2, Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2012 NAICS Code 334220, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/31SG2//naics~334220.

⁵⁴ *Id.*

⁵⁵ Applicants for earth stations in the 50.4–51.4 GHz band must demonstrate that they comply with limits on the number of earth stations in a given county and Partial Economic Area. In addition, there are limits on the aggregate area in which the earth station, together with the similar area of any other earth station operating in the 50.4–51.4

(continued....)

they will be required to demonstrate that the proposed earth stations comply with technical criteria designed to ensure that the earth stations would not unduly limit possible future terrestrial service. These demands are necessary to ensure that the proposed operations will comply with the technical rules, and not unduly preclude possible future terrestrial operation in the band and will require small businesses as well as other entities that intend to offer such satellite telecommunications services to use professional, accounting, engineering or survey services in order to meet these requirements. To attain consistency with the existing application of our rules, the reporting, recordkeeping, and other compliance requirements resulting from our actions in the *Fifth Report and Order* will apply to all entities in the same manner.

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

18. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): (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 or reporting requirements under the rule for 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 small entities.⁵⁶

19. Rather than creating a new framework for the licensing of FSS earth stations in the 50.4-51.4 GHz band, the Commission chose to apply the identical licensing criteria applicable to the 24.75-25.25 GHz band and adopt existing rule sections that FSS transmitting earth station applicants must comply with when seeking authorization in bands shared with UMFUS. These steps will minimize the significant economic impact on small entities by not increasing the cost of compliance with an entirely new set of rules and regulations. Moreover, to the extent an entity is already licensed and operating the 24.75-25.25 GHz band, they may have the processes and procedures and infrastructure in place to facilitate compliance with our rules, and therefore may only incur minimal incremental costs to comply with the rules adopted for the 50.4-51.4 GHz band.

20. With respect to military access to the Upper 37 GHz band, the process established by the Commission protects bidders from harmful interference while enabling the Department of Defense to carry out operations in the Upper 37 GHz band on military bases and ranges. The FCC will review requests for access to the Upper 37 GHz band to assess any potential impact on non-Federal licensees, contact the potentially affected licensees, and facilitate direct coordination with the Department and NTIA.

Report to Congress

21. The Commission will send a copy of the *Fifth Report and Order*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.⁵⁷ In addition, the Commission will send a copy of the *Fifth Report and Order*, including this FRFA, to the Chief Counsel for Advocacy of the

(Continued from previous page) _____
GHz band in the same county, generate a power flux density (PFD), at 10 meters above ground level, of greater than or equal to -77.6 dBm/m²/MHz. Furthermore, the area in which the earth station generates a PFD, at 10 meters above ground level, of greater than or equal to -77.6 dBm/m²/MHz may not contain any major event venue, urban mass transit route, passenger railroad, or cruise ship port. In addition, that area shall not cross any of the following types of roads, as defined in functional classification guidelines issued by the Federal Highway Administration: Interstate, Other Freeways and Expressways, or Other Principal Arterial.

⁵⁶ 5 U.S.C. § 603(c)(1)–(4).

⁵⁷ See 5 U.S.C. § 801(a)(1)(A).

SBA. A copy of the *Fifth Report and Order*, and FRFA (or summaries thereof) will also be published in the Federal Register.⁵⁸

⁵⁸ See 5 U.S.C. § 604(b).

APPENDIX C

List of Commenters to *Third FNPRM***Comments**

5G Americas
AT&T Services Inc. (AT&T)
The Boeing Company (Boeing)
Competitive Carriers Association (CCA)
The National Academy of Sciences, through its Committee on Radio Frequencies (CORF)
CTIA
Dynamic Spectrum Alliance (DSA)
EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC (EchoStar)
Elefante Group, Inc. (Elefante)
Ericsson
Federated Wireless, Inc. (Federated Wireless)
Intel Corporation and Cisco Systems, Inc. (Intel/Cisco)
Open Technology Institute at New America (New America)
Nokia
Petri Mähönen, Ljiljana Simić and Pierre de Vries (de Vries)
Qualcomm Incorporated (Qualcomm)
Samsung Electronics America (Samsung)
SES Americom, Inc. and its affiliate O3b Limited (SES)
Space Exploration Technologies Corp. (SpaceX)
Starry, Inc. (Starry)
Telecommunications Industry Association (TIA)
T-Mobile USA, Inc. (T-Mobile)
United States Cellular Corporation (U.S. Cellular)
Viasat, Inc. (Viasat)
Wireless Internet Service Providers Association (WISPA)

Reply Comments

AT&T
Boeing
CTIA
DSA
EchoStar
Elefante
Enterprise Wireless Association (EWA)
Federated Wireless
Intel/Cisco
SES
SpaceX
Starry
Telesat Canada (Telesat)
TIA
T-Mobile
U.S. Cellular
Viasat

Ex Parte Comments Relating to Issues Resolved in *Fifth Report and Order*

AT&T Services, Inc.

CTIA
Hughes Networks Systems, LLC
T-Mobile USA, Inc.
Verizon

**STATEMENT OF
CHAIRMAN AJIT PAI**

Re: *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, GN Docket No. 14-177

In order to auction the upper 37 GHz, 39 GHz, and 47 GHz bands later this year, we need to resolve pending issues regarding the U.S. Department of Defense's ability to use of the upper 37 GHz band in limited circumstances. This *Order* does just that. We establish a process that protects the interests of non-Federal licensees in the band while accommodating the Department's needs. That's a win for American leadership in 5G *and* a win for our country's military—not something that happens every day.

This item also establishes rules authorizing Fixed-Satellite Service operators, such as satellite broadband service operators, to license individual earth stations in the 50 GHz band. This will hopefully enable faster and more advanced services for American consumers.

I want to take this opportunity to thank our counterparts at the Pentagon for their collaboration. The issues here are quite complex, and I appreciate their working in good faith to reach a mutually agreeable resolution.

Today's work would also not be possible without the help of Jonathan Campbell, John Schauble, Blaise Scinto, Dana Shaffer, Donald Stockdale, Cecilia Sulhoff, Joel Taubenblatt, and Nancy Zaczek from the Wireless Telecommunications Bureau; Kate Matraves, Giulia McHenry, and Emily Talaga from the Office of Economics and Analytics; Michael Ha, Julius Knapp, and Ronald Repasi from the Office of Engineering and Technology; Jose Albuquerque, Diane Garfield, Jennifer Gilsenan, and Tom Sullivan from the International Bureau; and David Horowitz, Thomas Johnson, Bill Richardson, and Anjali Singh from the Office of General Counsel.

**STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY**

Re: *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, GN Docket No. 14-177

In today's item, we encounter two spectrum frontiers bands that will enable expansion of communications services by different industry participants. We resolve the final substantive issue – sharing in the Upper 37 GHz band – standing in the way of the announced 37/39/47 GHz auction. We also adopt rules regarding FSS earth station licensing in the 50 GHz band. The similarities between these bands extend beyond being millimeter wave bands; they both demonstrate the spectrum sharing challenges that the Commission faces as we identify bands for next-generation networks.

While spectrum sharing is a constant topic of conversation, the primary focal point of wireless spectrum policy is – and shall remain – clearing spectrum bands so that they can be auctioned for exclusive use licenses. This is the paradigm that established the U.S. as the leader in spectrum policy and wireless technologies, and there is absolutely no reason to deviate from this course, unless clearing is not possible.

But, I am firmly against efforts to permit sharing in spectrum bands post auction. This item unfortunately does just that by permitting the Department of Defense (DOD) to access spectrum in the Upper 37 GHz band. Make no mistake: this deal is far, far, far from ideal. While this is a sharing model that should never be replicated and should not serve as precedent for future actions, I will reluctantly support today's decision because future federal access in the Upper 37 GHz is clearly limited to DOD, only for operations that cannot be accommodated in the Lower 37 GHz shared band, is restricted to military bases and ranges, and is strictly for defense applications or national security purposes. Further, the Commission can deny a DOD request that causes a significant risk of harmful interference to existing or planned wireless deployments.

I appreciate that, based on concerns I raised, along with my colleagues and relevant industry stakeholders, many of these access criteria were added or clarified from those in the posted draft, such as restricting access to military bases and ranges and giving the FCC a “veto” power. I would have gone further by permitting DOD only a certain number of additional sites in the Upper 37 GHz, or by making the licensee primary, as proposed by some wireless providers. Moreover, I remain concerned that the revised language lacks an appropriate level of specificity as to how many aggregate bases and ranges there actually are, or whether the Commission will really and fully utilize its “veto” power when access to a requested area can be traded for some other Commission priority.

More generally, I am willing to approve this approach on a one-time basis because DOD has stated that requests for access will be very, very rare, and it will provide licensees with the certainty needed to bid and invest in deploying the band. DOD officials must stick to their word. I will swiftly and loudly call out any attempts to backtrack on these assurances. Additionally, as we prepare for the 2019 World Radiocommunication Conference (WRC-19), I expect that all federal agencies will be fully supportive of our efforts regarding mobile operations in the 37 and 39 GHz bands. If there are any problems, I will be the first one at the Chairman's doorstep asking to revisit this issue.

Moving on to the 50 GHz band, I certainly agree with some commenters who question why we are finalizing our rules to permit earth station licensing without considering the corresponding issue of wireless operations in this band. Since this is another instance where there is sharing at issue, it would have been preferable to consider both satellite and wireless uses at the same time. However, as these earth station licensing rules are identical to those in other 5G bands, I will also be supportive of this portion of the item.

That said, I am perplexed as to why certain federal agencies blocked the submission of a proposal for mobile use in 50 GHz to a WRC-19 regional preparation meeting but are silent on the action we take today. These earth stations are likely to point directly at the passive band sensors that they claim to want to protect, and NTIA is actively seeking more stringent protections internationally for earth stations than for wireless networks. It is my understanding that these agencies are willing to give this item a pass because the satellite players are known entities to them and there are relatively few earth stations. Who knew the nation's wireless providers were so incognito? Additionally, the idea that there are so few earth stations is ironic given the push for earth stations in motion, which could lead to putting transmitters on all planes, trains, and other vehicles in many of the identified 5G bands, including this one. Not only must we be vigilant on this ESIMs issue, but we also must continue the interagency discussions on 50 GHz to establish reasonable and data-driven protection criteria for the passive bands, have a solid proposal for WRC-19 that will permit global harmonization of next-generation wireless services in this band, and establish wireless rules and schedule a future auction for these frequencies.

As presented, this is not my preferred item both in terms of content and process, as I would have rather taken some extra time to improve its many imperfections. While this didn't happen, we are left with the choice to support it or not. I choose the former in an attempt to rekindle future efforts for the release of more unencumbered commercial spectrum, including 3.45, 26 and 50 GHz, that our nation's wireless carriers can use to meet the insatiable demands for wireless services now and in the future.

**STATEMENT OF
COMMISSIONER BRENDAN CARR**

Re: *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, GN Docket No. 14-177

We have a problem. And it's a good one to have.

So many technologists and entrepreneurs are devoting their resources and brainpower to providing fast Internet service to Americans that they're elbowing each other to get their hands on previously fallow or underused spectrum.

November was the FCC's "Space Month," when we authorized or gave market access to four separate companies investing in fast Internet delivered from the sky. At least two companies have since launched next-generation low earth satellites, or LEOs. This technology promises speeds and latency that approximate what most Americans get from their home broadband. These companies are aiming to cover the entire United States, bringing more choice and competition to communities across the country. With the right regulatory framework in place, we are seeing technology and the private sector work to close the digital divide.

Not to be outdone, terrestrial wireless providers are racing to roll out 5G. We already have the largest commercial deployment of 5G in the world. And by the end of this year 5G will be live in more than 40 cities around the country. You can buy the first 5G phone now, and the second is coming shortly. Businesses are using 5G hotspots as their primary access points. And many families for the first time are beginning to feel that they have a choice for high-speed, home Internet.

All of this is great news for American consumers, but there's a catch: these satellite and wireless providers want to use the same millimeter wave spectrum. So it is our responsibility at the Commission, in partnership with our counterparts at NTIA who represent federal government users, to figure out how to sort through these competing priorities.

On that count, two themes run through this order.

The first is the Commission's ongoing commitment to using market principles to allocate spectrum. With respect to the 37 GHz band, which saw some back and forth in the run up to today's vote over coordination zones, the order now provides additional clarity about the rights that federal and private sector users will have. This additional certainty will help ensure that we have another successful high-band auction. With respect to the 50 GHz band, the order addresses interference from satellite use of the band so that this spectrum might also be auctioned and used for 5G.

The second theme running through the order is the benefit of wringing the most use out of every available megahertz of spectrum. Millimeter wave spectrum is in high demand now, evidenced by the roughly \$2 billion worth of bids thus far in our 24 GHz auction. Terrestrial wireless providers project increased demand for 5G services, and they would like to preserve wide bands of spectrum in 50 GHz. Satellite companies could use the uplink capacity for their own Internet services. They note that their earth stations point upwards, towards space, and so are unlikely to cause interference with future terrestrial uses. In fact, we implemented a sharing regime between satellite and terrestrial uses in the 24 GHz band, and we import a similar arrangement into 50 GHz through this order.

I want to thank the Wireless Bureau for its work on this item, and its non-stop work on clearing and auctioning spectrum. I also want to thank the Chairman for his work over the past few weeks to bring additional clarity to license rights in the 37 GHz portion of this order. Our decision is greatly improved by that effort. The item has my support.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL
APPROVING IN PART, DISSENTING IN PART**

Re: *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, GN Docket No. 14-77

You want to bring a new spectrum band to market? It takes work. You can start by searching for airwaves that are suitable for new wireless uses. Then you will need to come up with a way to clear existing users and relocate them elsewhere. You will need to ensure that your new users do not harm adjacent users or the services they provide. You also will have to explore how to harmonize your rules for this band with the rest of the world in order to develop an ecosystem of devices that make service viable. In addition, you'll have to come up with a distribution system for these airwaves, and if they're licensed this will typically involve the careful design of an auction.

As you might imagine, this takes time. In fact, historically, it has taken this agency as much as ten years to clear spectrum bands and bring them to market. Sharing spectrum is faster, but even this has traditionally taken as much as five years.

This is the kind of effort that preceded our decision today. This is the kind of effort that this agency has put into developing the opportunity for commercial use of the 37, 39, and 47 GHz bands.

That's why today's decision is so striking. Rather than moving us closer to bringing these bands to market, it injects new uncertainty into the viability of parts of these bands just months before they are set for commercial auction.

Let me explain. The decision circulated three weeks ago set forth a process for accommodating federal sites in the upper portion of the 37 GHz band. But instead of offering clear, transparent guidelines about how spectrum coordination with the Department of Defense would work, it raised more questions about federal use in the band than it answered. A few more details were offered by my colleagues late yesterday, but the process still lacks specificity. Worse, even these details were clouded by an eleventh-hour missive from the Department of Commerce last evening, which set forth its own version of how the process for coordinating new federal uses would occur.

If you're confused—trust me, you're not alone. At this point, all of this uncertainty and regulatory back-and-forth could easily depress participation and bidding at auction. That would be a shame—because a lot of work has gone into developing these airwaves for new mobile use.

But sadly, this course of events is not unique. It has been the recent pattern in our 5G auctions. Right now, our 24 GHz auction is underway. That too has been mired in an embarrassing public dispute about spectrum rights between this agency and the Department of Commerce.

This is embarrassing. It is no way to do spectrum policy. I believe that bidders should know with certainty that they will be able to use the spectrum they are purchasing at auction.

That is why I asked that we take a step back and issue a rulemaking. I think the public should be able to weigh in on the new coordination process that was shared with my colleagues yesterday. I think the public should be able to comment on the federal accommodation process contemplated here because I believe every bidder should know with precision what rights they purchase at auction. I also suggested that we seek broader input on how we can improve interagency coordination going forward, to avoid these kinds of hiccups.

Bringing new spectrum bands to market is not simple. But to make the effort worth the reward, we are going to have to develop a more thoughtful way to manage federal disputes over our airwaves.

We are going to have to formulate clear principles. We are going to need a transparent process. And by any measure, this is not it. So while I support moving forward with rules to allow operation of individually licensed earth stations in the 50 GHz band, I believe that this decision falls short with respect to the upper 37 GHz band. Consequently, I approve in part and dissent in part because I believe that for good spectrum policy, we have more work to do.

**STATEMENT OF
COMMISSIONER GEOFFREY STARKS,
APPROVING IN PART, DISSENTING IN PART**

Re: *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, GN Docket No. 14-177

Good policymaking requires good process. Agencies must conduct their rulemakings in an open and transparent manner, so the public can review our plans and offer input. Doing so allows parties the opportunity to raise issues that we might have missed and generally results in a better final product. This is particularly important for spectrum policy, where we are making decisions impacting the next generation of technology and services, not just for the United States, but for the world.

Such is the case with this item. After the original draft was placed on the agenda, questions arose about the process governing DoD requests for new sites in the Upper 37 GHz band. Parties expressed concern that the original draft language suggested that non-Federal licensees in the Upper 37 GHz band would have inferior rights to future DoD requests to open new sites in that band. They also objected to the lack of notice regarding the proposed approach to handling such DoD requests. Accordingly, the staff worked with NTIA and DoD to revise the item to respond to those concerns.

While I appreciate those efforts, I believe the appropriate course would have been to delay final action until we had sought and reviewed public comment on the process adopted in this item. I fully support the plan to auction this spectrum, but I am concerned that we did not give the public a fair opportunity to comment on the process that would apply for new DoD requests to operate in this band. And while I appreciate that we are moving quickly to make millimeter wave spectrum available, I don't think a brief delay here would be problematic. We are only today seeking comment on the procedures governing the auction of this spectrum, and the equipment standards for the 37 GHz band will not be finalized for at least a year. I would rather take our time and get it right than rush a decision and risk getting it wrong.

With respect to the other issue presented in this item, I support the order's common-sense approach that allows satellite operators to roll out broadband solutions to reach underserved communities while protecting future terrestrial wireless operations in the 50 GHz band. Satellite broadband is a promising technology, particularly for disaster relief and the hardest-to-reach populations, and I'm pleased that we were able to reach a solution here that permits such service while we develop rules for terrestrial operations.

Finally, my thanks to the staff in the Wireless Telecommunications Bureau, International Bureau, and the Office of Engineering and Technology for your hard work on this item.