

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

In the Matter of)
Facilitating Shared Use in the 3.1-3.55 GHz Band) WT Docket No. 19-348
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NOTICE OF PROPOSED RULEMAKING

Adopted: December 12, 2019

Released: December 16, 2019

Comment Date: (30 days after Federal Register publication)

Reply Comment Date: (60 days after Federal Register publication)

By the Commission: Chairman Pai and Commissioners O’Rielly, Carr, Rosenworcel and Starks issuing separate statements.

I. INTRODUCTION

1. In this Notice of Proposed Rulemaking (Notice), we propose to remove the existing non-federal secondary radiolocation and amateur allocations in the 3.3-3.55 GHz band and to relocate incumbent non-federal operations out of the band, in order to prepare the band for possible expanded commercial wireless use. We also seek comment on relocation options and transition mechanisms for incumbent non-federal operations. This Notice is consistent with the Commission’s responsibilities, as specified in the MOBILE NOW Act, to identify spectrum for new mobile and fixed wireless use and, specifically, to work in consultation with the National Telecommunications and Information Administration (NTIA) to evaluate the feasibility of allowing commercial wireless services to share use of spectrum between 3.1 and 3.55 GHz. By proposing to delete the existing non-federal secondary allocations from the 3.3-3.55 GHz band in the Table of Frequency Allocations, we are taking an important initial step towards satisfying Congress’s directives and making as much as 250 megahertz of spectrum from this band potentially available for advanced wireless services, including 5G, the next generation of wireless connectivity.

II. BACKGROUND

2. Congress addressed the pressing need for additional spectrum for wireless broadband in the Fiscal Year 2018 omnibus spending bill, signed into law in March 2018, which includes the MOBILE NOW Act under Title VI of RAY BAUM’S Act.¹ In light of the importance of making spectrum available for new technologies and maintaining America’s leadership position in the future of communications technology, the Act mandates that the Secretary of Commerce, working through NTIA: (1) submit, in consultation with the Commission and the head of each affected Federal agency (or a designee thereof), a report by March 23, 2020 on the feasibility of “allowing commercial wireless service,

¹ See Consolidated Appropriations Act, 2018, P.L. 115-141, Division P, the Repack Airwaves Yielding Better Access for Users of Modern Services (RAY BAUM’S) Act, Title VI (the Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act or MOBILE NOW Act).

licensed or unlicensed, to share use of the frequencies between 3100 megahertz and 3550 megahertz,”² and (2) identify with the Commission “at least 255 megahertz of Federal and non-Federal spectrum for mobile and fixed wireless broadband use” by December 31, 2022.³ With respect to this second obligation of NTIA and the Commission, the Act further specifies that not less than “100 megahertz below the frequency of 6000 megahertz shall be identified for use on an exclusive, licensed basis for commercial mobile use, pursuant to the Commission’s authority to implement such licensing in a flexible manner”⁴ and “subject to potential continued use of such spectrum by incumbent Federal entities in designated geographic areas” in accordance with specified terms of the Act and not less than “100 megahertz below the frequency of 8000 megahertz shall be identified for use on an unlicensed basis.”⁵

3. Of the frequencies between 3100 MHz and 3550 MHz, NTIA has identified the top 100 megahertz in the 3.45-3.55 GHz band as the most promising portion for sharing in the near term and is conducting a feasibility assessment in collaboration with the Department of Defense (DOD), and continues to study the feasibility of sharing in the entire 3.1-3.55 GHz band with existing and future federal users.⁶ The report on the 3.1-3.55 GHz band must include: “(1) [a]n assessment of the operations of Federal entities that operate Federal Government stations authorized to use the frequencies . . .”; (2) “[a]n assessment of the possible impacts of such sharing on Federal and non-Federal users already operating on the frequencies . . .”; (3) “[t]he criteria that may be necessary to ensure shared licensed or unlicensed services would not cause harmful interference to Federal or non-Federal users already operating in the frequencies . . .” and (4) “[i]f such sharing is feasible, an identification of which of the frequencies described in that subsection are most suitable for sharing with commercial wireless services through the assignment of new licenses by competitive bidding, for sharing with unlicensed operations, or through a combination of licensing and unlicensed operations.”⁷ Once NTIA has submitted the report, “[t]he Commission, in consultation with the NTIA, shall seek public comment on the repor[t] . . .”⁸

4. Currently, the entire 3.1-3.55 GHz band is allocated for both federal and non-federal radiolocation services, with non-federal users operating on a secondary basis to federal radiolocation services, which have a primary allocation.⁹ The federal radiolocation allocation is one piece of a broader federal primary allocation for radiolocation in the 2.9-3.65 GHz band.¹⁰ The DOD operates high-powered defense radar systems on fixed, mobile, shipborne, and airborne platforms in this band. These radar systems are used in conjunction with weapons control systems and for the detection and tracking of air

² *Id.* § 605(a).

³ *Id.* § 603(a)(1).

⁴ *Id.* § 603(a)(2)(B).

⁵ *Id.* § 603(a)(2)(A); *see also id.* § 603(a)(2)(C) (“55 megahertz below the frequency of 8000 megahertz shall be identified for use on either a licensed or unlicensed basis, or a combination of licensed and unlicensed”).

⁶ See U.S. Dept. of Commerce, Annual Report on the Status of Spectrum Repurposing at 20 (Aug. 2019), available at <https://go.usa.gov/xparp>; *see also Our Wireless Future: Building A Comprehensive Approach to Spectrum Policy: Hearing Before the Subcomm. on Comms. and Technology of the H. Comm. on Energy and Commerce*, 116th Cong. (July 16, 2019) (Testimony of Derek Khlopin, Senior Policy Advisor, NTIA) (“We started aggressively looking at [the 3.1-3.55 GHz] range, what we found in the short-term is the upper 100, the 3450-3550, presents the opportunity in the near-term to make spectrum available. Having said that, we’ll continue to look for the larger block as well . . . [w]e’re very, very optimistic about it.”).

⁷ MOBILE NOW Act § 605(c).

⁸ *Id.* § 605(d).

⁹ *See* 47 CFR § 2.106 and US108; *id.* § 90.103(b), (c)(12).

¹⁰ 47 CFR § 2.106.

and surface targets. The DOD also operates radar systems used for fleet air defense, missile and gunfire control, bomb scoring, battlefield weapon locations, air traffic control, and range safety.¹¹

5. In addition, the 3.3-3.5 GHz band is allocated for non-federal amateur use and the 3.5-3.55 GHz band is allocated for federal aeronautical radionavigation services.¹² Between 3.3 and 3.55 GHz, there are only eight active licenses being used for a variety of commercial and industrial radiolocation services, such as doppler radar to provide weather information to broadcast viewers.¹³ Non-federal transmitters operating between 3.3-3.5 GHz are limited to survey operations and cannot exceed a peak power of 5 watts into the antenna.¹⁴ From 3.1-3.3 GHz, the band is allocated for space research (active) and earth exploration satellite (active) in addition to radiolocation services.¹⁵ There are 17 non-federal radiolocation licenses below 3.3 GHz, held by power companies and municipalities.¹⁶

6. Finally, we note that among the non-federal users already operating on these frequencies are hundreds of experimental licenses, including special temporary authorizations (STAs), active throughout the 3.1-3.55 GHz band.¹⁷ These licenses and STAs, pursuant to part 5 of the Commission's rules, may be granted for a broad range of research and experimentation purposes but such operations are on a non-interference basis (i.e., if an experimental facility should cause interference, the licensee is required to discontinue operation).¹⁸ Many of the recurring STAs in the band enable short-term use of these or other frequencies to add additional capacity during sporting events.¹⁹

7. In light of the foregoing statutory provisions contained in the MOBILE NOW Act, the Wireless Telecommunications Bureau in February 2019 imposed a freeze on accepting and processing applications for new or expanded part 90 Radiolocation Service operations in the 3.1-3.55 GHz band to "maintain a stable spectral environment in a band that is under active consideration for possible alternative use."²⁰

¹¹ See NTIA Compendium of Federal Spectrum Use, available at <https://www.ntia.doc.gov/other-publication/2017/federal-government-spectrum-compendium>; NTIA Special Publication 00-40, Federal Radar Spectrum Requirements at 26 (May 2000) (explaining why certain radar systems are in certain bands), available at <https://www.ntia.doc.gov/report/2000/federal-radar-spectrum-requirements>.

¹² See 47 CFR § 2.106.

¹³ Of the eight licenses, three are held by NBC Telemundo License LLC; one is held by Station Venture Operations, LP; one is held by I.O.U. Acquisitions; one is held by Air-Tel, LLC; one is held by Nexstar Broadcasting, Inc; and one is held by the Town of Warrensburg/Warrensburg Police Department.

¹⁴ See 47 CFR § 90.103(b), (c)(13).

¹⁵ See *id.* § 2.106.

¹⁶ Specifically, eight licenses are held by Alabama Power Company; seven licenses are held by Georgia Power Company; and two licenses are held by the city and county of Denver/Denver International Airport.

¹⁷ The total number of active experimental authorizations is always changing. Experimental STAs, for example, may be requested for operation of a conventional experimental radio service station for a temporary period of no longer than six months. See 47 CFR §§ 5.54(a)(2), 5.61. A current list of active experimental authorizations throughout the 3.1-3.55 GHz band can be found via the Office of Engineering and Technology's Experimental Licensing System Generic Search, available at <https://apps.fcc.gov/oetcf/els/reports/GenericSearch.cfm>.

¹⁸ See 47 CFR §§ 5.3, 5.84.

¹⁹ See, e.g., Broad Comm Inc. Application for Special Temporary Authority, File No. 1336-EX-ST-2019 (filed July 23, 2019) (requesting temporary use of the 3.31-3.51 GHz band to provide video coverage of the 2019 U.S. Open Tennis Tournament and related activities using ten Nucomm transmitters, model number 23PT3-L02-1TO); CP Communications Application for Special Temporary Authority, File No. 1236-EX-ST-2019 (filed July 3, 2019) (seeking a single experimental STA to provide remote audio and video at 32 NFL stadiums using eight "various" transmitters in the 3.2-3.55 GHz band).

III. DISCUSSION

8. In this Notice, we propose to remove the non-federal allocations for the 3.3-3.55 GHz band and relocate incumbent non-federal users out of the band. We note that 3.3-3.55 GHz has been the focus for 5G use by standards setting organizations and in other countries, and we thus believe our focus on this band would promote international harmonization.²¹ We also note that NTIA has identified the top 100 megahertz in the 3.45-3.55 GHz band as the most promising portion for making new spectrum available for commercial use, and we therefore expect that band will be our first priority. We also seek comment on transition and protection mechanisms for non-federal incumbent operators.

A. Removal of Non-Federal Allocations

9. We propose to eliminate the non-federal radiolocation services allocation in the 3.3-3.55 GHz band and the non-federal amateur allocation in the 3.3-3.5 GHz.²² Our proposed removal is an initial step toward potential future shared use between federal operations and flexible use commercial services, in furtherance of our obligations under the MOBILE NOW Act to identify spectrum for mobile and fixed wireless use and to work with NTIA to evaluate this band for potential shared use. As the Commission has recognized in other proceedings, mid-band spectrum is well-suited for next generation wireless broadband services given the combination of favorable propagation characteristics (as compared to high bands) and the opportunity for additional channel re-use (as compared to low bands).²³ As a general matter, the Commission considers clearing spectrum for flexible use to be a priority when it is feasible to do so. Where it has not been feasible, the Commission has attempted to introduce sharing. As demonstrated by the commercial interest in the adjacent 3.5 GHz band, as well as the extensive use of experimental licenses and STAs operating in the 3.1-3.55 GHz band throughout 2019, flexible-use operations in the 3 GHz band hold substantial promise.²⁴

(Continued from previous page)

²⁰ *Temporary Freeze on Non-Federal Applications in the 3100-3550 MHz Band*, WT Docket No. 19-39, Public Notice, 34 FCC Rcd 19 (WTB Feb. 22, 2019). Two pending applications for new stations are subject to this freeze. See Application of Fort Myers Broadcasting Company, ULS File No. 0008282472 (filed July 12, 2018); Application of Southern California Edison Company, ULS File No. 0008495115 (filed Jan. 17, 2019). In May, Dynetics, Inc., filed requests for modification and waiver of the freeze to allow certain continued operations in the 3.1-3.3 GHz band; these petitions remain pending. See Dynetics, Inc. Request for Modification of Temporary Freeze on Non-Federal Applications in the 3100-3550 MHz Band, WT Docket No. 19-39 (filed May 17, 2019); Dynetics, Inc. Request for Limited Waiver of Temporary Freeze on Non-Federal Applications in the 3100-3550 MHz Band, WT Docket No. 19-39 (filed May 17, 2019); see also Letter from Jeffrey E. Rummel, Attorney for Dynetics, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 19-348 (filed Dec. 5, 2019) (renewing its requests for waiver and modification); Letter from Brett Kilbourne, Utilities Technology Council, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 19-348 (filed Dec. 5, 2019) (supporting Dynetics's requests); Letter from Jeffrey L. Sheldon, Counsel for Southern Company Services, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 19-348 (filed Dec. 5, 2019) (same).

²¹ For example, 3GPP, a global industry standards organization that develops protocols for mobile technology, has specified two spectrum operating bands for 5G that overlap with the 3.3-3.55 GHz band: band n77 between 3.3-4.2 GHz, and band n78 between 3.3-3.8 GHz. 3GPP TS 38.104, NR; Base Station (BS) Radio Transmission and Reception. Note: 3GPP specifications refer to 5G as New Radio (NR).

²² Specifically, we propose to remove these non-federal allocations from the Table of Frequency Allocations in section 2.106 of our rules, 47 CFR § 2.106, and make conforming rule changes in parts 90 and 97, 47 CFR pts. 90, 97. See App. A, Proposed Rules.

²³ See, e.g., *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-222, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915, 6917-18, para. 5 (2018) (*3.7 GHz NPRM*).

²⁴ See, e.g., *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (*3.5 GHz Order*) (the Commission added co-primary fixed and mobile allocations to the 3550-3650 MHz band to facilitate a new commercial broadband service at 3550-3700 MHz); 3G Wireless, LLC Application for (continued....)

10. By taking the initial step needed to clear the band of allocations for non-federal incumbents, we further our continued efforts to make more mid-band spectrum potentially available to support next generation wireless networks—consistent with the mandate of the MOBILE NOW Act. We seek comment on this proposal.

B. Future of Incumbent Non-Federal Operations

11. We seek comment on appropriate relocation options for incumbent non-federal users, either to the 3.1-3.3 GHz band or to other frequencies. Which other frequencies might be appropriate to accommodate the current and future uses of the band? Should we consider different frequencies for different licensees depending on their specific needs? For example, are there different considerations that we should take into account in considering alternate frequencies for the relatively low-power operations in the 3.3-3.5 GHz band and the high-power weather radar operations in the 3.5-3.55 GHz band? We believe that moving the high-power weather radars in particular may benefit operations in the adjacent 3.55-3.7 GHz band by minimizing the potential for harmful interference from the non-federal radars to Citizens Broadband Radio Service operations.²⁵

12. We seek comment on relocating non-federal licensees to another band. What band would be most appropriate? For example, if we relocated them to the 3.1-3.3 GHz band, we would propose that they would continue to operate on a secondary basis to federal operations, consistent with the current allocations in the band. We seek comment on whether this proposal is the most efficient and appropriate scheme for future use of the band. We also seek comment on how best to balance the interests of existing licensees in the 3.3-3.55 GHz band with potentially preparing the band for possible future shared use between federal incumbents and commercial wireless services, if feasible. And we seek comment on how to ensure that non-federal secondary operations in the 3.1-3.3 GHz band will continue to protect federal radar systems. Commenters should precisely describe proposed approaches and explain the costs and benefits of their proposals.

13. With respect to amateur operations, is there sufficient existing amateur spectrum in other bands that can support the operations currently conducted in the 3.3-3.5 GHz band? We note that the 3.40-3.41 GHz segment is designated for communications to and from amateur satellites.²⁶ We seek comment on: the extent to which the band is used for this purpose, whether existing satellites can operate on other amateur satellite bands, and on an appropriate timeframe for terminating these operations in this band.

14. We also seek comment generally on the transition mechanism and process for relocating existing non-federal users. How can the Commission expedite and incentivize the transition of existing operations? What is a reasonable timeframe to transition the operations? Should these licenses sunset at

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Special Temporary Authority, File No. 1736-EX-ST-2019 (filed Sept. 15, 2019) (seeking experimental STA to support transmission of NFL Monday Night Football games throughout the season from various stadium sites); *3.7 GHz NPRM*, 33 FCC Rcd at 6932-38, paras. 49-65; *see also* Letter from Kara Graves, Director, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 19-348, at 1 (filed Dec. 5, 2019) (“The 3.1-3.55 GHz band presents a prime opportunity to make mid-band spectrum available for 5G use in part due to adjacent and international band characteristics.”).

²⁵ See, e.g., CTIA Reply, GN Docket No. 12-354, at 8-9 (filed Aug. 8, 2017) (arguing that OOB Emission from high-power weather radar systems are high enough to cause base station shutdown or damage); Wireless Innovation Forum (WInnForum) Comments, GN Docket No. 12-354, at 4 (filed July 24, 2017) (“In particular, the power levels and rolloff characteristics of adjacent band weather radar systems will pose challenges to CBRS operations in the 3.5 GHz band.”). In 2018, both CTIA and WInnForum opposed Fort Myers Broadcasting’s application for a new weather radar station to operate in the 3.5-3.55 GHz band for these reasons. *See* Informal Objection of WInnForum, ULS File No. 000828472 (filed Aug. 27, 2018); Informal Objection of CTIA, ULS File No. 000828472 (filed Aug. 14, 2018).

²⁶ See 47 CFR §§ 97.207-97.211.

the end of the existing license term, or at another date certain? What are the potential costs to non-federal incumbent licensees to relocate their operations to another band as compared to the benefits of preparing the band for future shared use? What technical characteristics of non-federal licensee's equipment should factor into our relocation considerations (e.g., tunability, bandwidth, operational power, etc.)?²⁷ How should non-federal incumbent licensees be compensated for their relocation costs? Should their current status, i.e., secondary to federal radiolocation services,²⁸ factor into any relocation considerations, including cost reimbursement?

IV. PROCEDURAL MATTERS

15. *Ex Parte Presentations.* The proceedings shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.²⁹ Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must: (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission’s *ex parte* rules.

16. *Comment Period and Filing Procedures.* Pursuant to sections 1.415 and 1.419 of the Commission’s rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission’s Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- **Electronic Filers:** Comments may be filed electronically using the Internet by accessing the ECFS: <http://apps.fcc.gov/ecfs/>.
- **Paper Filers:** Parties who choose to file by paper must file an original and one copy of each filing. If more than one active docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

²⁷ See, e.g., Letter from Kevin Milner, Secretary, Treasurer, Ski Country Amateur Radio Club, to Federal Communications Commission, WT Docket No. 19-348, at 1 (filed Dec. 6, 2019) (arguing that its equipment cannot be re-channeled below 3.4 GHz and seeking relocation costs); *see* Comment of Devin Ulibarri, WT Docket No. 19-348 (filed Nov. 29, 2019) (arguing that amateur networks in the 3.1-3.55 GHz band cannot move easily into other amateur allocations because there is no readily available commercial equipment to support the bandwidth).

²⁸ *Id.* § 90.103(b), (c)(12).

²⁹ *Id.* §§ 1.1200 *et seq.*

Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

17. *People with Disabilities:* To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

18. *Availability of Documents.* Comments, reply comments, and *ex parte* submissions will be available for public inspection during regular business hours in the FCC Reference Center, Federal Communications Commission, 445 12th Street, S.W., Room CY-A257, Washington, D.C. These documents will also be available via ECFS. Documents will be available electronically in ASCII, Microsoft Word, and/or Adobe Acrobat.

19. *Initial Regulatory Flexibility Analysis.* As required by the Regulatory Flexibility Act of 1980, as amended (RFA),³⁰ the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities of the policies and rules addressed in this *Notice*. The IRFA is set forth in Appendix B. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines for comments on the *Notice* and should have a separate and distinct heading designating them as responses to the IRFA.

20. *Paperwork Reduction Act Analysis.* This document contains proposed new or modified information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

21. *Further Information.* For additional information on this proceeding, contact Jessica Greffenius of the Mobility Division, Wireless Telecommunications Bureau, at jessica.greffenius@fcc.gov or (202) 418-2896, or Mary Claire York of the Mobility Division, Wireless Telecommunications Bureau, at MaryClaire.York@fcc.gov or (202) 418-2205.

V. ORDERING CLAUSES

22. IT IS ORDERED, pursuant to the authority found in sections 1, 2, 4(i), 303, 316, and 1502 of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 303, 316, and 1502, and section 1.411 of the Commission's Rules, 47 C.F.R § 1.411, that this Notice of Proposed Rulemaking IS HEREBY ADOPTED.

³⁰ 5 U.S.C. § 603.

23. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Proposed Rules

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

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

[INSERT CURRENT AUTHORITY CITATION]

2. Section 2.106, the Table of Frequency Allocations, is amended as follows:

- a. Pages 40 and 41 are revised.
 - b. In the list of United States (US) Footnotes, footnote US108 is revised.
 - c. In the list of Federal Government (G) Footnotes, footnotes G2 and G59 are revised.

§ 2.106 Table of Frequency Allocations.

The revisions read as follows:

* * * * *

Federal Communications Commission

FCC 19-130

2670-2690 FIXED 5.410 MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive)	2670-2690 FIXED 5.410 MOBILE (space-to-Earth) 5.208B MOBILE except aeronautical mobile 5.384A Earth exploration-satellite (passive) Radio astronomy Space research (passive)	2670-2690 FIXED 5.410 MOBILE (Earth-to-space) 5.415 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A 5.419 Earth exploration-satellite (passive) Radio astronomy Space research (passive)	2670-2690 FIXED 5.410 MOBILE except aeronautical mobile 5.384A MOBILE-SATELLITE (Earth-to-space) 5.351A 5.419 Earth exploration-satellite (passive) Radio astronomy Space research (passive)	5.149 5.412	5.149	US205	US385	
2690-2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)			2690-2700 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive)			US246		
5.340 5.422	2700-2900 AERONAUTICAL RADIONAVIGATION 5.337 Radiolocation		2700-2900 METEOROLOGICAL AIDS AERONAUTICAL RADIONAVI- GATION 5.337 US18 Radiolocation G2			2700-2900	2700-2900	Aviation (87)
5.423 5.424	2900-3100 RADIOLOCATION 5.424A RADIONAVIGATION 5.426		5.423 G15			5.423 US18	2900-3100 MARITIME RADIONAVIGATION Radiolocation US44	
5.425 5.427			5.423 G15			5.423 US18	2900-3100 MARITIME RADIONAVIGATION Radiolocation US44	
3100-3300 RADIOLOCATION	Earth exploration-satellite (active) Space research (active)		5.427 US316			5.427 US316	3100-3300 MARITIME RADIONAVIGATION Radiolocation G59	
5.149 5.428			5.427 US316			5.427 US316	3100-3300 Earth exploration-satellite (active) Space research (active) Radiolocation	
3300-3400 RADIOLOCATION	3300-3400 RADIOLOCATION Amateur Fixed Mobile		5.427 US316			5.427 US316	3100-3300 Earth exploration-satellite (active) Space research (active) Radiolocation	
5.149 5.429 5.429A 5.429B 5.430	3300-3400 RADIOLOCATION Amateur Fixed Mobile		5.149 5.429C 5.429D			5.149 5.429 5.429F	3300-3500 RADIOLOCATION	
3400-3600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except			3400-3500 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.427 5.427R			3400-3500 FIXED FIXED-SATELLITE (space-to-Earth)	3300-3500 RADIOLOCATION	

11247

Federal Communications Commission

FCC 19-130

Table of Frequency Allocations		International Table		United States Table		FCC Rule Part(s)
Region 1 Table (See previous page)	Region 2 Table	Region 3 Table		Federal Table	Non-Federal Table	
aeronautical mobile 5.430A Radiolocation	5.431A 5.431B Amateur Radiolocation 5.433 5.282	3500-3600 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.431B Radiolocation 5.433	3500-3550 FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.433A Radiolocation 5.433	RADIOLOCATION AERONAUTICAL RADIONAVIGATION (ground-based) G110	3500-3550 RADIOLOCATION AERONAUTICAL RADIONAVIGATION (ground-based) G110	
5.431		3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) Mobile	3600-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile aeronautical mobile 5.434 Radiolocation 5.433	3550-3650 RADIOLOCATION G59 AERONAUTICAL RADIONAVIGATION (ground-based) G110	3550-3600 FIXED MOBILE except aeronautical mobile US105 US433	Citizens Broadband (96)
		3650-3700 FIXED FIXED-SATELLITE (space-to-Earth) Mobile	3650-3700 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile aeronautical mobile 5.434 Radiolocation 5.433	3650-3700 FIXED MOBILE except aeronautical mobile US105 US433	3600-3650 FIXED FIXED-SATELLITE (space-to-Earth) US107 US245	Satellite Communications (25) Citizens Broadband (96)
		3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	3700-4200 FIXED MOBILE except aeronautical mobile US109 US349	3650-3700 FIXED FIXED-SATELLITE (space-to-Earth) NG169 NG185	
		4200-4400 AERONAUTICAL MOBILE (R) 5.436 AERONAUTICAL RADIONAVIGATION 5.438 5.437 5.439 5.440 4400-4500 FIXED MOBILE 5.440A 4500-4800 FIXED	4200-4400 AERONAUTICAL RADIONAVIGATION	4200-4400 AERONAUTICAL RADIONAVIGATION 5.440 US261 4400-4940 FIXED MOBILE	3700-4200 FIXED FIXED-SATELLITE (space-to-Earth) NG457A	Satellite Communications (25) Fixed Microwave (10)
						Aviation (87)

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MOBILE 5.440A 4800-4990 FIXED MOBILE 5.440A 5.441A 5.441B 5.442 Radio astronomy	US113 US245 US342 4940-4990	4800-4940 US113 US342 4940-4990	
5.149 5.339 5.443 4990-5000 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY Space research (passive)	5.339 US342 US385 G122 4990-5000 RADIO ASTRONOMY US74 Space research (passive)	5.339 US342 US385 5.339 US342 US385	
5.149	US246		

* * * * *

UNITED STATES (US) FOOTNOTES

* * * * *

US108 In the band 10-10.5 GHz, survey operations, using transmitters with a peak power not to exceed five watts into the antenna, may be authorized for Federal and non-Federal use on a secondary basis to other Federal radiolocation operations.

* * * * *

FEDERAL GOVERNMENT (G) FOOTNOTES

* * * * *

G2 In the bands 216.965-216.995 MHz, 420-450 MHz (except as provided for in G129), 890-902 MHz, 928-942 MHz, 1300-1390 MHz, 2310-2390 MHz, 2417-2450 MHz, 2700-2900 MHz, 5650-5925 MHz, and 9000-9200 MHz, use of the Federal radiolocation service is restricted to the military services.

* * * * *

G59 In the bands 902-928 MHz, 3100-3300 MHz, 3550-3650 MHz, 5250-5350 MHz, 8500-9000 MHz, 9200-9300 MHz, 13.4-14.0 GHz, 15.7-17.7 GHz and 24.05-24.25 GHz, all Federal non-military radiolocation shall be secondary to military radiolocation, except in the sub-band 15.7-16.2 GHz airport surface detection equipment (ASDE) is permitted on a co-equal basis subject to coordination with the military departments.

* * * * *

PART 90—PRIVATE LAND MOBILE RADIO SERVICES

3. The authority citation for Part 90 continues to read as follows:

[INSERT CURRENT AUTHORITY CITATION]

4. In § 90.103, revise the table in paragraph (b) by removing the entries for the “3300 to 3500” MHz and “3500 to 3550” MHz bands to read as follows:

§ 90.103 Radiolocation Service.

* * * * *

(b) * * *

RADIOLOCATION SERVICE FREQUENCY TABLE

Frequency or band	Class of station(s)	Limitation
* * *	* *	* *
Megahertz		
***	* *	* *
3100 to 3300do	12
3550 to 3650do	30
***	* *	* *

* * * * *

PART 97—AMATEUR RADIO SERVICE

5. The authority citation for part 97 continues to read as follows:

[INSERT CURRENT AUTHORITY CITATION]

6. Revise Section 97.207 to read as follows:

§ 97.207 Space station.

* * * * *

(c) * * *

(2) The 7.0-7.1 MHz, 14.00-14.25 MHz, 144-146 MHz, 435-438 MHz, 2400-2450 MHz, 5.83-5.85 GHz, 10.45-10.50 GHz, and 24.00-24.05 GHz segments.

* * * * *

7. Revise Section 97.209 to read as follows:

§ 97.209 Earth station.

* * * * *

(b) * * *

(2) The 7.0-7.1 MHz, 14.00-14.25 MHz, 144-146 MHz, 435-438 MHz, 1260-1270 MHz and 2400-2450 MHz, 5.65-5.67 GHz, 10.45-10.50 GHz and 24.00-24.05 GHz segments.

8. Revise Section 97.211 to read as follows:

§ 97.211 Space telecommand station.

* * * * *

(c) * * *

(2) The 7.0-7.1 MHz, 14.00-14.25 MHz, 144-146 MHz, 435-438 MHz, 1260-1270 MHz and 2400-2450 MHz, 5.65-5.67 GHz, 10.45-10.50 GHz and 24.00-24.05 GHz segments.

* * * * *

9. In § 97.301, revise the table in paragraph (a) to read as follows:

§ 97.301 Authorized frequency bands.

* * * * *

(a) * * *

Wavelength band	ITU Region 1	ITU Region 2	ITU Region 3	Sharing requirements see §97.303 (paragraph)
VHF	MHz	MHz	MHz	
6 m	-	50-54	50-54	(a)
2 m	144-146	144-148	144-148	(a), (k)
1.25 m	-	219-220	-	(l)
Do	-	222-225	-	(a)
UHF	MHz	MHz	MHz	
70 cm	430-440	420-450	430-440	(a), (b), (m)
33 cm	-	902-928	-	(a), (b), (e), (n)
23 cm	1240-1300	1240-1300	1240-1300	(b), (d), (o)
13 cm	2300-2310	2300-2310	2300-2310	(d), (p)
Do	2390-2450	2390-2450	2390-2450	(d), (e), (p)
SHF	GHz	GHz	GHz	
5 cm	5.650-5.850	5.650-5.925	5.650-5.850	(a), (b), (e), (r)
3 cm	10.0-10.5	10.0-10.5	10.0-10.5	(a), (b), (k)
1.2 cm	24.00-24.25	24.00-24.25	24.00-24.25	(b), (d), (e)
EHF	GHz	GHz	GHz	
6 mm	47.0-47.2	47.0-47.2	47.0-47.2	
4 mm	76-81	76-81	76-81	(c), (f), (s)
2.5 mm	122.25-123.00	122.25-123.00	122.25-123.00	(e), (t)
2 mm	134-141	134-141	134-141	(c), (f)
1 mm	241-250	241-250	241-250	(c), (e), (f)
	Above 275	Above 275	Above 275	(f)

10. In § 97.303, revise paragraphs (b) and (f) and remove and reserve paragraph (q) to read as follows:

§ 97.303 Frequency sharing requirements.

* * * * *

(b) Amateur stations transmitting in the 70 cm band, the 33 cm band, the 23 cm band, the 5 cm band, the 3 cm band, or the 24.05-24.25 GHz segment must not cause harmful interference to, and must accept interference from, stations authorized by the United States Government in the radiolocation service.

* * * * *

(f) Amateur stations transmitting in the following segments must not cause harmful interference to radio astronomy stations: 76-81 GHz, 136-141 GHz, 241-248 GHz, 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz, or 926-945 GHz. In addition, amateur stations transmitting in the following segments must not cause harmful interference to stations in the Earth exploration-satellite service (passive) or the space research service (passive): 275-286 GHz, 296-306 GHz, 313-356 GHz, 361-365 GHz, 369-392 GHz, 397-399 GHz, 409-411 GHz, 416-434 GHz, 439-467 GHz, 477-502 GHz, 523-527 GHz, 538-581 GHz, 611-630 GHz, 634-654 GHz, 657-692 GHz, 713-718 GHz, 729-733 GHz, 750-754 GHz, 771-776 GHz, 823-846 GHz, 850-854 GHz, 857-862 GHz, 866-882 GHz, 905-928 GHz, 951-956 GHz, 968-973 GHz and 985-990 GHz.

* * * * *

(q) [Reserved]

* * * * *

11. In § 97.305, revise the SHF portion of the table in paragraph (c) by removing the entry for the 9 cm band to read as follows.

§ 97.305 Authorized emission types.

* * * * *

(c) * * *

Wavelength Band	Frequencies	Emission types authorized	Standards see §97.307(f), paragraph:
**	*	*	*
SHF:			
5 cm	Entire band	MCW, phone, image, RTTY, data, SS, test, pulse	(7), (8), and (12).
3 cm	Entire band	MCW, phone, image, RTTY, data, SS, test	(7), (8), and (12).
1.2 cm	Entire band	MCW, phone, image, RTTY, data, SS, test, pulse	(7), (8), and (12).
**	*	*	*

APPENDIX B

Initial Regulatory Flexibility Analysis

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

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

2. This *Notice of Proposed Rulemaking (Notice)* proposes to remove the existing non-federal radiolocation and amateur allocations in the 3.3-3.55 GHz band and to relocate incumbent non-federal operations out of the band, in order to prepare the band for possible future shared use between commercial wireless services and federal incumbents. It also seeks comment on relocation options and transition mechanisms for incumbent non-federal operations. If non-federal licensees are relocated to the 3.1-3.3 GHz band, the Commission proposes that they would continue to operate on a secondary basis to federal operations, consistent with the current allocations in the band. This *Notice* is consistent with the Commission's responsibilities, as specified in the MOBILE NOW Act, to work with the National Telecommunications and Information Administration (NTIA) to identify spectrum for new mobile and fixed wireless use and, specifically, to work in consultation with NTIA to evaluate the feasibility of allowing commercial wireless services to share use of spectrum between 3.1 and 3.55 GHz.⁴ The Commission's proposal to delete the existing non-federal secondary allocations from the 3.3-3.55 GHz band in the Table of Frequency Allocations is an important initial step towards satisfying Congress's directives and making as much as 250 megahertz of spectrum from the band potentially available for advanced wireless services, including 5G.

B. Legal Basis

3. The proposed action is authorized pursuant to sections 1, 2, 4(i), 303, 316, and 1502 of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 201(b), 303, 316, and 1502, and section 1.411 of the Commission's Rules, 47 C.F.R. § 1.411.

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

4. The RFA directs agencies to provide a description of, and where feasible, an estimate of, the number of small entities that may be affected by the proposed rules, if adopted.⁵ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."⁶ In addition, the term "small business" has the

¹ See 5 U.S.C. § 603. The RFA, see 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 5 U.S.C. § 603(a).

³ See *id.*

⁴ See Consolidated Appropriations Act, 2018, P.L. 115-141, Division P, the Repack Airwaves Yielding Better Access for Users of Modern Services (RAY BAUM'S) Act, Title VI (the Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act or MOBILE NOW Act).

⁵ 5 U.S.C. § 603(b)(3).

⁶ 5 U.S.C. § 601(6).

same meaning as the term “small business concern” under the Small Business Act.⁷ A small business concern is one that: (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.⁸

5. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, 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.⁹ 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.¹⁰ These types of small businesses represent 99.9 percent of all businesses in the United States, which translates to 28.8 million businesses.¹¹

6. 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.”¹² 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).¹³

7. 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.”¹⁴ U.S. Census Bureau data from the 2012 Census of Governments¹⁵ indicate that there were 90,056 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.¹⁶ Of this number there were 37,132 General purpose governments (county¹⁷, municipal and town or township¹⁸) with populations of less than 50,000 and 12,184 Special purpose governments (independent school districts¹⁹ and special districts²⁰) 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

⁷ 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in 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.”

⁸ 15 U.S.C. § 632.

⁹ See 5 U.S.C. § 601(3)-(6).

¹⁰ 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).

¹¹ 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).

¹² 5 U.S.C. § 601(4).

¹³ 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 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”.

¹⁴ 5 U.S.C. § 601(5).

populations of less than 50,000.²¹ Based on this data we estimate that at least 49,316 local government jurisdictions fall in the category of “small governmental jurisdictions.”²²

8. *Radio Frequency Equipment Manufacturers (RF Manufacturers).* Neither the Commission nor the SBA has developed a small business size standard applicable to Radio Frequency Equipment Manufacturers (RF Manufacturers). There are several analogous SBA small entity categories applicable to RF Manufacturers -- Fixed Microwave Services, Other Communications Equipment Manufacturing, and Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing. A description of these small entity categories and the small business size standards under the SBA rules are detailed below.

9. *Fixed Microwave Services.* Microwave services include common carrier,²³ private-operational fixed,²⁴ and broadcast auxiliary radio services.²⁵ They also include the Upper Microwave Flexible Use Service²⁶, Millimeter Wave Service²⁷, Local Multipoint Distribution Service (LMDS),²⁸ the Digital Electronic Message Service (DEMS),²⁹ and the 24 GHz Service,³⁰ where licensees can choose between common carrier and non-common carrier status.³¹ 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 licenses, and five 24 GHz licenses, and 467 Millimeter Wave licenses in the microwave services.³² 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.³³ For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.³⁴ Of this total, 955 firms had employment of 999 or fewer employees and 12 had employment of 1000 employees or more.³⁵ Thus under this SBA category and the associated size standard, the Commission estimates that a majority of fixed microwave service licensees can be considered small.

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¹⁵ 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/jst/pages/metadata.xhtml?lang=en&type=program&id=program.en.COG#>

¹⁶ 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).

¹⁷ 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.

¹⁸ 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.

¹⁹ 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.

²⁰ 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.

²¹ 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 - (continued....)

10. *Other Communications Equipment Manufacturing.* This industry comprises establishments primarily engaged in manufacturing communications equipment (except telephone apparatus, and radio and television broadcast, and wireless communications equipment).³⁶ Examples of such manufacturing include fire detection and alarm systems manufacturing, Intercom systems and equipment manufacturing, and signals (e.g., highway, pedestrian, railway, traffic) manufacturing.³⁷ The SBA has established a size standard for this industry as all such firms having 750 or fewer employees.³⁸ U.S. Census Bureau data for 2012 show that 383 establishments operated in that year.³⁹ Of that number, 379 operated with fewer than 500 employees and 4 had 500 to 999 employees.⁴⁰ Based on this data, we conclude that the majority of Other Communications Equipment Manufacturers are small.

11. *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.⁴¹ 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.⁴² The SBA has established a small business size standard for this industry of 1,250 employees or less.⁴³ U.S. Census Bureau data for 2012 show that 841 establishments operated in this industry in that year.⁴⁴ 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.⁴⁵ Based on this data, we conclude that a majority of manufacturers in this industry are small.

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<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 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.

²² *Id.*

²³ See 47 CFR Part 101, Subparts C and I.

²⁴ See 47 CFR Part 101, Subparts C and H.

²⁵ Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. See 47 CFR Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast 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 mobile TV pickups, which relay signals from a remote location back to the studio.

²⁶ See 47 CFR Part 30.

²⁷ See 47 CFR Part 101, Subpart Q.

²⁸ See 47 CFR Part 101, Subpart L.

²⁹ See 47 CFR Part 101, Subpart G.

³⁰ See *id.*

³¹ See 47 CFR §§ 101.533, 101.1017.

³² These statistics are based on a review of the Universal Licensing System on September 22, 2015.

³³ See 13 CFR § 121.201, NAICS code 517210.

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

12. The proposed actions in the *Notice* to remove the existing non-federal radiolocation and amateur allocations in the 3.3-3.55 GHz band and relocate incumbent non-federal operations out of the band, if adopted, may impose reporting, recordkeeping and other compliance requirements on small entities as well as other licensees. In the event the proposed actions are adopted, the *Notice* seeks comment on relocation options and on transition and protection mechanisms for incumbent non-federal operations.⁴⁶ We note that between 3.3 and 3.55 GHz, there are only eight active licenses being used for a variety of commercial and industrial radiolocation services, with the majority being held by large entities.⁴⁷ We also note that between 3.1-3.3 GHz, the band is allocated for space research (active) and earth exploration satellite (active) in addition to radiolocation services, and that there are 17 non-federal radiolocation licenses below 3.3 GHz, that held by large power companies and municipalities.⁴⁸ Thus, while the Commission is not currently in a position to determine whether, if adopted, the rule changes that could result from the proposals and the questions raised in the *Notice* will require small entities to hire attorneys, engineers, consultants, or other professionals, and we cannot quantify the cost of compliance with any potential rule changes that may be adopted, we do not believe that the costs and/or administrative burdens associated with any of the potential rule changes will unduly burden small entities.

13. In the discussion of the proposals in the *Notice*, the Commission has sought comments from parties in the proceeding on options, alternatives and other matters we should consider, including seeking cost and benefit analyses.⁴⁹ The Commission expects that the information it receives in

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³⁴ U.S. Census Bureau, *2012 Economic Census of the United States*, Table EC1251SSZ5, 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/51SSZ5//naics~517210.

³⁵ *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.”

³⁶ See U.S. Census Bureau, 2017 NAICS Definitions, NAICS Code “334290 Other Communications Equipment Manufacturing”, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=334290&search=2017+NAICS+Search&search=2017>.

³⁷ *Id.*

³⁸ See 13 CFR 121.201, NAICS Code 334290.

³⁹ 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 334290, https://factfinder.census.gov/bkmk/table/1.0/en/ECN/2012_US/31SG2//naics~334290.

⁴⁰ *Id.*

⁴¹ See U.S. Census Bureau, 2012 NAICS Definitions, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing”

(continued....)

comments will help it identify and evaluate all relevant matters associated with the proposed removal of the existing non-federal radiolocation and amateur allocations in the 3.3-3.55 GHz band and the relocation of incumbent non-federal operations out of the band, including compliance costs and burdens on small entities.

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

14. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its proposed 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 and 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.”⁵⁰

15. To assist in the Commission’s evaluation of the economic impact on small entities and alternatives, as a result of the actions that have been proposed in this proceeding, in the *Notice* the Commission has raised questions and sought comment on alternatives to identify appropriate relocation options, mechanisms, timing, and costs.⁵¹ Regarding costs, the Commission has specifically requested information on the potential costs to non-federal incumbent licensees to relocate their operations to another band as compared to the benefits of preparing the band for future shared use, and on how non-federal incumbent licensees should be compensated for their relocation costs. The Commission expects to consider more fully the economic impact on small entities following its review of comments filed in response to the *Notice*, including costs and benefits information. The Commission’s evaluation of the comments filed in this proceeding will shape the final conclusions it reaches, the final alternatives it considers, and the actions it ultimately takes in this proceeding to minimize any significant economic impact that may occur on small entities.

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

16. None.

(Continued from previous page) _____
https://factfinder.census.gov/faces/affhelp/jsp/pages/metadata.xhtml?lang=en&type=ib&id=ib.en./ECN.NAICS2012_334220#.

⁴² *Id.*

⁴³ 13 CFR § 121.201, NAICS Code 334220.

⁴⁴ 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.

⁴⁵ *Id.*

⁴⁶ See *Notice*, paras. 10-12.

⁴⁷ Of the eight licenses, three are held by NBC Telemundo License LLC; one is held by Station Venture Operations, LP; one is held by I.O.U. Acquisitions; one is held by Air-Tel, LLC; and one is held by Nexstar Broadcasting, Inc; and one by the Town of Warrensburg/Warrensburg Police Department.

⁴⁸ Eight licenses are held by Alabama Power Company; seven licenses are held by Georgia Power Company; and two licenses are held by the city and county of Denver/Denver International Airport.

⁴⁹ See *Notice*, paras. 10-12.

⁵⁰ 5 U.S.C. § 603(c)(1)-(4).

⁵¹ See *Notice*, paras. 8-11.

**STATEMENT OF
CHAIRMAN AJIT PAI**

RE: *Facilitating Shared Use in the 3.1-3.55 GHz Band*, WT Docket No. 19-348

In March 2018, Congress passed, and the President signed the MOBILE NOW Act. That law aims to advance American leadership in wireless technologies in several ways. Among other things, it requires the executive branch to explore sharing of the 3.1-3.55 GHz band between federal operations and commercial wireless services. Currently, portions of this band are used by the Department of Defense, with some non-federal users offering services on a secondary basis.

To prepare the upper portion of the 3.1-3.55 GHz band for the future shared use contemplated by Congress, today we are proposing to remove the existing non-federal secondary radiolocation and amateur allocations in the 3.3-3.55 GHz band and relocate those operations to other frequencies, such as the 3.1-3.3 GHz portion of the band. Today's proposal would enable continued use of the spectrum by the Department of Defense, while creating a glidepath for this critical mid-band spectrum to be freed up for 5G. Clearing the upper 250 megahertz of the band of existing non-federal operations would build upon the Commission's ongoing work to enable commercial use of spectrum in nearby bands, including the 3.55-3.7 GHz band and the 3.7-4.2 GHz band, commonly called the C-band. Together, these three bands would make a massive amount of prime mid-band spectrum—as much as 680 megahertz—available for new fixed and mobile wireless services.

Our action today is just another example of our comprehensive strategy to free up spectrum for commercial use across the country and advance American leadership in the next generation of wireless connectivity. We have been aggressive in freeing up mid-band spectrum in particular. For instance, an auction of the 3.5 GHz band will commence on June 25, 2020. The Commission is also focused on commencing an auction of 280 MHz of spectrum in the C-band late next year. And we recently voted to put the 2.5 GHz band—the largest swath of contiguous spectrum in the country below 3 GHz—to use for the American people.

In addition to these mid-band efforts, we've also been hard at work when it comes to high-band spectrum. In January, we finished an auction of spectrum in the 28 GHz band. In May, we concluded an auction of spectrum in the 24 GHz band. And earlier this week, we launched an auction of 3,400 MHz of spectrum in the upper 37, 39, and 47 GHz bands, which is the largest spectrum auction in American history.

None of these accomplishments would be possible without the labors of our talented staff. And in particular, I would like to thank the following for their work on this item: Jessica Greffenius, Roger Noel, Matthew Pearl, Paul Powell, Milton Price, Jaclyn Rosen, Becky Schwartz, Dana Shaffer, Joshua Smith, Don Stockdale, Scot Stone, and Mary Claire York of the Wireless Telecommunications Bureau; Michael Ha, Julie Knapp, Tom Mooring, Nicholas Oros, and Anthony Serafini of the Office of Engineering and Technology; Chana Wilkerson from the Office of Communications Business Opportunities; and Michael Carlson, David Horowitz, Bill Richardson, and Anjali Singh from the Office of General Counsel.

**STATEMENT OF
COMMISSIONER MICHAEL O'RIELLY**

RE: *Facilitating Shared Use in the 3.1-3.55 GHz Band*, WT Docket No. 19-348

I happily approve today's notice starting a proceeding to take the initial steps towards opening the 3.1 to 3.55 GHz band for next-generation commercial wireless services. To realize the true potential of 5G, the Commission will need far more mid-band spectrum than is currently available or already in the pipeline. Unlike high- and low-band spectrum, the mid bands provide the perfect combination of increased capacity and improved geographic coverage that is ideal for 5G offerings. It is why it's been the focus of my spectrum efforts for the last several years. Because of the greater propagation, the mid bands are considered a crucial input to provide 5G in less populated areas of America where there is unlikely to be a business case for dense millimeter wave deployments.

Currently, we have general authorized access – or unlicensed-like – 3.5 GHz spectrum available, with priority access licenses being auctioned in June, and C-band scheduled to be auctioned in late 2020. While this spectrum schedule is great news, we will need even more to meet the needs of all those interested in deploying 5G or other innovative services. Accordingly, it is imperative that we find additional bandwidth, and the 3.1 to 3.55 GHz frequencies – located adjacent to the 3.5 GHz band – are the best candidate.

This item starts the fairly benign task of moving the non-federal incumbents out of the 3.3 to 3.55 GHz portion of the band. And, for those unfamiliar, these are the very same frequencies that other countries are targeting for 5G, with portions of the band already globally harmonized or in the process of being studied for that purpose. One positive outcome from WRC-19 is that the international community agreed to study the 3.3 to 3.4 GHz band for IMT, so that it would have the same designation as 3.4 to 3.55 GHz, which is mostly harmonized. As such, I am completely supportive of this item.

At the same time, while we start to relocate non-federal systems, the bigger challenge of the federal incumbent users still remains, which will require considerably more attention and energy. Consider that Congress identified the 3.1 to 3.55 GHz band numerous times for possible commercial wireless use and ordered NTIA to report on the feasibility of sharing this band by March 2020. By all accounts, however, they are only studying 3.45 to 3.55 GHz. This is not what Congress required, and it is even more disappointing because the U.S. Department of Defense (DoD) previously signaled years ago that it would cede this spectrum for commercial purposes, before reversing course and engaging in protracted, unnecessary studies. I've seen comments that DoD disputes this point, but it has been verified multiple times by reputable individuals in the know, so everyone should stop pretending otherwise. Simply put, this upper 100 megahertz of spectrum should be cleared and repurposed for commercial use immediately.

As for the spectrum below 3.45 GHz, work may still have to be completed to determine whether it can be cleared, and, if clearing is not possible, then sharing the spectrum with the federal incumbents must be explored. Any needed studies should be completed as soon as possible. We can't wait for years to figure out how much and where the spectrum is used, what needs to occur to relocate users, or what protection mechanisms need to be put into place.

In this vein, I am slightly disappointed that we do not take this opportunity to move non-federal users out of the lower 200 megahertz, similarly starting the process for introducing next-generation services into 3.1 to 3.3 GHz. As this is ultimately our intention, it doesn't make sense to me to consider moving the current non-federal users of the upper portion of the band into the lower portion of this band when it is clear that we must either clear or share that spectrum too. But, I look forward to reviewing the record as it develops and discussing this issue with interested parties.

I thank the Chairman for starting the process of repurposing these bands for next-generation wireless services. In particular, I appreciate his willingness to add language to the draft stating that clearing spectrum is the Commission's priority and that repurposing the 3.45 to 3.55 band should be a matter of greatest importance.

**STATEMENT OF
COMMISSIONER BRENDAN CARR**

RE: *Facilitating Shared Use in the 3.1-3.55 GHz Band*, WT Docket No. 19-348

In January, I began calling 2019 the “Year of 5G.” The *concept* of 5G leadership in America did, in fact, go viral. My hashtag #YearOf5G sadly did not. In my annual pursuit of dominating a very, very particular part of Twitter, today’s item gives me yet another hashtag candidate: The Year of 3 GHz. That’s because 2020 is shaping up for tremendous action in that band.

At the top of 3 GHz, we are focused on a 2020 auction of C-Band spectrum. In the middle of the band, we have a 2020 auction of CBRS spectrum lined up. And here at the bottom of 3 GHz, we are now taking steps that could make available up to 250 MHz of additional spectrum for advanced wireless services, including 5G.

This is an NPRM, so I cannot promise where we will land precisely on all of the questions in 3.1-3.55 GHz—much as I cannot promise just how viral #YearOf3GHz will go. But I can promise that this Commission will continue our work to free up more spectrum for next-gen applications.

I want to thank the Wireless Bureau for its work on this item. It has my support.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

RE: *Facilitating Shared Use in the 3.1-3.55 GHz Band*, WT Docket No. 19-348

This Notice of Proposed Rulemaking is the kind of forward-looking, proactive effort we need to start freeing up valuable mid-band spectrum for next-generation 5G wireless services.

In it, we recognize that our federal partners at the National Telecommunications and Information Administration actively are studying opportunities to make the 3.1-3.55 GHz band available for 5G use. But rather than sitting on our hands while that work is being done, we are here today getting a head start. We are taking steps to clean up our own house so that when the time is right we can move quickly to repurpose some or all of this band for new uses. To this end, today's rulemaking asks questions about removing non-federal, secondary allocations and relocating incumbent users. This is the preliminary stuff. The truth is we have a long way to go before this set of airwaves can be opened for 5G. Still, this effort is a small step in the right direction and it has my support.

When it comes to mid-band spectrum for 5G I think one thing is clear: we need to move more and move faster.

That's why when the agency started a proceeding to slow down plans to bring mid-band spectrum in the 3.5 GHz band to auction, I dissented.

It's why when the agency passed up an opportunity to reimagine the 2.5 GHz band for 5G and instead opted for a messy and limited auction instead, I dissented.

It's why when the agency prioritized auctioning its third, fourth, and fifth millimeter wave bands this year before what could have been its very first mid-band auction, I dissented.

And it's why when the agency started a rulemaking on the C-band, I suggested that if we wanted to avoid delay we should include Congress in our work—but that too was ignored and now we are paying for it in lost time and fresh ambiguities about authority.

Here's the truth. If you survey these proceedings you will see that our spectrum policies are increasingly divorced from the realities on the ground in the United States and the priorities in the rest of the world—and this has consequences for our wireless leadership, digital divide, and national security.

If you want evidence, you don't need to take my word for it. Earlier this year the Defense Innovation Board—the United States military's premier advisory board of academic researchers and private sector technologists—surveyed the state of next-generation 5G networks and issued a sober warning. They found that “the country that owns 5G will own innovations and set the standards for the rest of the world,” and “that country is currently not likely to be the United States.”

Why is that? Our failure to move fast on mid-band spectrum. As the experts on the board stated, “the FCC is currently prioritizing mmWave over sub-6 mid-band spectrum . . . but this is a fundamentally flawed focus.”

They're right. To date the Federal Communications Commission has focused its early efforts to support 5G wireless service by bringing only high-band spectrum to market. The rest of the world does not share this singular, early focus on high-band, millimeter wave airwaves. In fact, at least sixteen countries have already auctioned mid-band spectrum specifically for the provision of 5G wireless services. They include Australia, Finland, Germany, Italy, Ireland, Japan, Kuwait, Latvia, Mexico,

Oman, Qatar, Saudi Arabia, South Korea, Spain, the United Arab Emirates, and the United Kingdom. In addition, China allocated mid-band spectrum for 5G use last year.

But in the United States, we have yet to auction a single swath of mid-band spectrum. To date, we have brought exactly zero megahertz of mid-band airwaves to market in the 5G era. Rather than recognize this reality, this agency has simply insisted that all bands matter and all is well. But that is clearly not the case when you look at efforts abroad or right here at home where our carriers are chomping at the bit for mid-band resources.

So today's effort to identify non-federal, secondary allocations in one swath of mid-band airwaves has benefits, but it's not enough. Because the evidence demonstrates very clearly that for too long the United States has been alone in its mission to make millimeter wave the center of our early 5G approach. This is a problem. It means we could find ourselves on the sidelines as mid-band spectrum becomes the core of worldwide 5G service. That means less scale, higher costs, and interoperability challenges. It also means—as I noted upfront—new challenges for national security, the digital divide, and our wireless leadership.

First, national security. Just over a month ago I testified before the Senate Committee on Homeland Security and Governmental Affairs that the most important step the United States can take to secure its networks in the short term is to make more mid-band spectrum available. Right now, in many of these airwaves worldwide there is only one Chinese vendor offering equipment. That means countries that are already building their 5G networks using mid-band spectrum do not have a competitive choice for secure equipment. But in the United States we have unique skill and scale. When deployment takes place here, vendors follow. And when we expand the market for secure equipment at home, it also grows abroad. On the heels of this hearing, the bipartisan leadership of the Senate Committees on Homeland Security and Government Affairs, Intelligence, Foreign Affairs, and Armed Services wrote the White House about this kind of problem and the lack of a national plan for 5G and security. They say we need one. They're right.

Second, the digital divide. Making millimeter wave spectrum the focus of our early 5G efforts is deepening the divide between rural and urban America. Recent commercial launches of 5G service in the United States using these airwaves are confirming what we already know—that commercializing millimeter wave will not be easy, given its propagation challenges. The network densification these airwaves require is costly, and this makes it unsuitable for rural areas. So if we want to serve everywhere in this country—and not create communities of 5G haves and have-nots—we need mid-band airwaves that provide both coverage and capacity, and we need them now. But just this week, the FCC kicked off yet another high-band spectrum auction. This one has a record-setting 3,400 megahertz of spectrum that will again largely only provide capacity opportunities in urban America. So I'll say it again. There is simply no reason we should be auctioning the 37, 39, and 47 GHz bands now before a mid-band auction of the 3.5 GHz band.

Third and finally, we are ceding international leadership when it comes to 5G. The findings of the Defense Innovation Board made it clear that we chose the wrong road in the race to 5G. We headed out with an exclusive focus on millimeter wave and got left behind by other nations that took action early on mid-band airwaves. It's time to correct course. We need to do it with urgency.

I worry that we don't have that sense of urgency. The plea to the White House from the bipartisan leadership of the Senate Committees on Homeland Security and Government Affairs, Intelligence, Foreign Affairs, and Armed Services has gone unanswered. We still don't have a national plan for 5G and security. We still don't have a national spectrum strategy. This was the subject of an Executive Order last year and a national spectrum plan was due back in July. And this agency still hasn't held an auction of mid-band spectrum in the 5G era.

These are challenges. We need to own up to them. Because if we want to secure global leadership, solve the digital divide, and secure our networks for the next generation, we have serious work to do.

**STATEMENT OF
COMMISSIONER GEOFFREY STARKS**

RE: *Facilitating Shared Use in the 3.1-3.55 GHz Band*, WT Docket No. 19-348

This item is another step towards identifying new mid-band spectrum that is critical to our efforts to increase broadband access and drive 5G innovation. Mid-band spectrum combines wide-ranging coverage with low latency and large capacity and will be fundamental to providers' deployment of next-generation wireless services. As the item states, the 3.1 to 3.55 GHz band is particularly attractive because of its proximity to other bands that we and the international community have already identified for such services.

We are in the midst of an era where technological innovation demands increasing amounts of spectrum, and identifying new bands that can be shared between incumbents and new uses will be critical. As we continue to open new bands to new services, I look forward to exploring creative policy and technical approaches that will permit the most efficient use of our limited spectrum resources.

Thank you to the staff of the Wireless Telecommunications Bureau for their work on this item.