

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

In the Matter of)	
)	
Expanding Flexible Use of the 12.2-12.7 GHz Band)	WT Docket No. 20-443
)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7-24 GHz)	GN Docket No. 17-183
)	
MVDDS 5G Coalition)	RM-11768 (Proceeding Terminated)
Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service)	

NOTICE OF PROPOSED RULEMAKING

Adopted: January 12, 2021

Released: January 15, 2021

By the Commission: Chairman Pai and Commissioners Carr and Simington issuing separate statements, Commissioner Rosenworcel concurring, Commissioner Starks concurring and issuing a statement.

Comment Date: 30 days after date of publication in the Federal Register

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I. INTRODUCTION

1. We initiate this proceeding to seek comment on how best to maximize efficient use of 500 megahertz of mid-band spectrum between 12.2-12.7 GHz (12 GHz band). In recent years, the Commission has made significant progress in ensuring that spectrum is put to its highest-value and most efficient use. Rather than adopting a one-size-fits-all approach, the Commission has carefully examined the characteristics of each spectrum band under consideration—including its propagation and capacity characteristics, the nature of in-band and adjacent band incumbent use, and the potential for international harmonization—before deciding whether and, if so, how to make it available for more intensive terrestrial or satellite use. We undertake a similar inquiry here for the 12 GHz band.

2. We seek comment on whether the Commission could add a new or expanded terrestrial Mobile allocation in the 12 GHz band without causing harmful interference to incumbent licensees. Assuming we could do so, we seek comment on whether that action would promote or hinder the delivery of next-generation services in the 12 GHz band given the existing and emergent services offered by incumbent licensees. We proceed mindful of the significant investments made by incumbents. Indeed, the Commission values the public interest benefits that could flow from investments made to provide satellite broadband services, particularly in rural and other underserved communities that might be more expensive to serve through other technologies. We believe that it is appropriate, however, to initiate a rulemaking proceeding to allow interested parties to address whether additional operations can be accommodated in the band while protecting incumbent operations from harmful interference and for the Commission to assess the public interest considerations associated with adding a new allocation.

II. BACKGROUND

3. In the United States, the 12 GHz band is allocated on a primary basis for non-Federal use for Broadcasting Satellite Service (BSS) (referred to domestically in the band as Direct Broadcast Satellite (DBS), Fixed Satellite Service (space-to-Earth) limited to non-geostationary orbit systems (NGSO FSS), and Fixed Service.¹ While these three services are co-primary, NGSO FSS and Fixed Service are allocated on a non-harmful interference basis with respect to BSS.²

4. NGSO FSS operators also have a non-federal co-primary downlink allocation and access to the 10.7-12.2 GHz band on a co-primary basis with Fixed Service in 10.7-11.7 GHz and on a primary basis from 11.7-12.2 GHz.³ Meanwhile, the adjacent frequencies above the band, 12.7-12.75 GHz, are allocated for non-federal Fixed Service, FSS, and Mobile Service.⁴

¹ See 47 CFR § 2.106, United States Table of Frequency Allocations, non-Federal Table for the band 12.2-12.7 GHz. NGSO FSS (space-to-Earth) operations are authorized pursuant to international footnote 5.487A, which provides additional allocations including in Region 2 as follows:

[The 12.2-12.7 GHz is] allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of [ITU Radio Regulations] No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the [ITU Radiocommunication] Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and [international footnote] No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the [12 GHz band] shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

47 CFR § 2.106, n.5.487A. When an international footnote is applicable without modification to non-Federal operations, the Commission places the footnote on the non-Federal Table. See 47 CFR § 2.105(d)(5).

² See 47 CFR § 2.106, n.5.490 (International Footnote). In Region 2, in the 12.2-12.7 GHz band, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services operating in conformity with the broadcasting satellite Plan for Region 2 contained in Appendix 30. “Harmful Interference” is defined under the Commission’s rules as “[i]nterference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with the ITU Radio Regulations.” 47 CFR § 2.1(c).

³ See 47 CFR § 2.106. See also *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809 (2017) (*2017 NGSO Order*). FSS is co-primary with Fixed Service for individually licensed earth stations. Individually licensed FSS earth stations require coordination with co-primary Fixed Service. The *2017 NGSO Order* also adopted rules to allow blanket earth station licensing for NGSOs in the 10.7–11.7 GHz band on an

(continued....)

5. Currently there are three services authorized and operating in the band: DBS providers operating under the primary BSS allocation, Multi-Channel Video and Data Distribution Service (MVDDS) licensees operating on a non-harmful interference basis to DBS under the co-primary Fixed Service allocation, and NGSO licensees operating on a non-harmful interference basis to DBS under the co-primary NGSO FSS allocation. The Commission's rules enable sharing between co-primary NGSO FSS and MVDDS using a combination of technical limitations, information sharing, and first-in-time procedures.⁵

6. The Commission added the DBS allocation in the early 1980s⁶ and DBS service began in 1994.⁷ In 1996 and 2004, some of these licenses were awarded by competitive bidding.⁸ In 2000, the Commission permitted a new terrestrial service, MVDDS, to operate in the 12 GHz band under the existing Fixed Service allocation on a co-primary, non-harmful interference basis to the incumbent DBS providers, and on a co-primary basis to NGSO FSS.⁹ The Commission also adopted rules to permit NGSO FSS operations in the 12 GHz band at this same time.¹⁰

7. The service rules for MVDDS permit one-way digital fixed non-broadcast service, including one-way direct-to-home/office wireless service.¹¹ To protect DBS, the Commission adopted

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unprotected basis relative to terrestrial Fixed Service. As a result, blanket earth station licenses for NGSOs cannot claim interference protection from terrestrial Fixed Service in the band. *Id.* at 7817, paras. 24-25.

⁴ See 47 CFR § 2.106.

⁵ See 47 CFR §§ 101.113(a) n.11, 101.147(p).

⁶ See *Inquiry into the Development of Regulatory Policy in Regard to Direct Broadcast Satellites for the Period Following the 1983 Regional Administrative Radio Conference*, Report and Order, 90 FCC2d 676 (1982), recon. denied, 53 RR2d 1637 (1983).

⁷ See *Revision of Rules and Policies for the Direct Broadcast Satellite Service*, Report and Order, 11 FCC 9712 (1995). DBS operations are subject to the International Telecommunication (ITU) Radio Regulations BSS and Feeder Link Plans contained in Appendices 30 and 30A.

⁸ In 1996 the Commission held two auctions for DBS orbital slots at 110° and 148° in 1996. See, e.g., <https://www.fcc.gov/auction/8>; <https://www.fcc.gov/auction/9>. In 2004, the Commission held an auction for three licenses for certain channels at DBS orbital slots at 175°, 166° and 157° but this auction was nullified. See *Direct Broadcast Satellite (DBS) Service Auction Nullified: Commission Sets Forth Refund Procedures for Auction No. 52 Winning Bidders and Adopts a Freeze on All New DBS Service Applications*, Public Notice, 20 FCC Rcd 20618, 20618 & n.3 (2005) (citing *Northpoint Technology, Ltd. v. FCC*, 412 F.3d 145 (D.C. Cir. 2005)). In its decision, the Appellate Court vacated and remanded the section of the DBS Auction Order that concluded that DBS is not subject to the auction prohibition of the Open-Market Reorganization for the Betterment of International Telecommunications Act, Pub. L. No. 106-180, 114 Stat. 48 § 647 (enacted Mar. 12, 2000), codified at 47 U.S.C. § 765f (ORBIT Act). *Id.* at n.3

⁹ See *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates; and Applications of Broadwave USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. to Provide A Fixed Service in the 12.2-12.7 GHz Band*, ET Docket No. 98-206, First Report and Order and Further Notice of Proposed Rule Making, 16 FCC Rcd 4096, 4177, para. 213 (2000) (*First R&O and FNPRM*).

¹⁰ *Id.* at 4099-4100, para. 2; see also *Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-band*, IB Docket No. 01-96, Report and Order, 17 FCC Rcd 7841 (2002).

¹¹ See 47 CFR § 101.1407 (two-way services can be provided using spectrum in other bands for the return link). See also *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, Memorandum Opinion and Order and Second Report and Order, 17 FCC Rcd 9614 (2002) (*MVDDS Second Report and Order*) (*aff'd Northpoint Technology, LTD et al. v. FCC*, 414 F.3d 61 (D.C. Cir. 2005)).

technical rules to ensure that MVDDS stations would not cause harmful interference to DBS and imposed extensive coordination requirements on MVDDS licensees for each proposed station.¹² These rules include detailed frequency coordination procedures, interference protection criteria, and limitations on signal emissions, transmitter power levels, and transmitter locations.¹³ In particular, the rules limit the effective isotropic radiated power (EIRP) for MVDDS stations to 14.0 dBm per 24 megahertz (–16.0 dBW per 24 megahertz).¹⁴

8. To accommodate co-primary DBS earth stations that must be protected from interference caused by MVDDS, an MVDDS licensee may not begin operation unless it can ensure that the equivalent power flux density (EPFD)¹⁵ from a proposed transmitting antenna does not exceed the applicable EPFD limit at any DBS subscriber location.¹⁶ Specifically, an MVDDS licensee cannot begin operation in the 12 GHz band unless it can ensure that the signal from its proposed transmitting antenna will not exceed certain specified EPFD limits at the receive antennas of any DBS customers of record (i.e., those who have had their antenna installed either before or within 30 days after the MVDDS licensee provides 90-days notice to DBS licensees of its intent to commence operations).¹⁷ Accordingly, when an MVDDS licensee is proposing to deploy a transmitting antenna, it must conduct a survey of the area around its proposed transmitting antenna site to determine the location of all DBS customers of record that may potentially be affected by its service.¹⁸ After coordinating a proposed transmitter with DBS licensees, the MVDDS licensee must remediate all complaints of interference to DBS customers of record for one year after it begins operating the transmitter.¹⁹ Going forward, the burden shifts to DBS licensees for new customers (and after one year for the customers of record) to take into account the presence of the MVDDS operations and ensure that DBS subscribers do not suffer interference from previously coordinated MVDDS stations.²⁰ The Commission found that these and the other technical requirements would ensure that any interference caused to DBS customers will not exceed a level that is considered permissible.²¹

¹² See 47 CFR § 101.1440.

¹³ See, e.g., *MVDDS Second Report & Order*, 17 FCC Rcd at 9634-9664 paras. 53-125; 9690-9695 paras. 196-209; 47 CFR §§ 25.139 (NGSO FSS coordination and information sharing between MVDDS licensees in the 12.2 GHz to 12.7 GHz band); 25.208(k) (Power flux density limits); 101.103 (Frequency coordination procedures); 101.105 (Interference protection criteria); 101.111 (Emission limitations); 101.113 (Transmitter power limitations); 101.129 (Transmitter location); 101.1409 (Treatment of incumbent licensees); 101.1440 (MVDDS protection of DBS).

¹⁴ See 47 CFR §§ 101.113(a) n.11; 101.147(p). The EIRP limit for MVDDS is expressed as a power spectral density, i.e., 14 dBm per 24 megahertz of spectrum. Herein we occasionally refer to EIRP levels in shorthand, e.g., “14 dBm.” We clarify that these shorthand references are for convenience only.

¹⁵ The EPFD is the power flux density produced at a DBS receive earth station, taking into account shielding effects and the off-axis discrimination of the receiving antenna assumed to be pointing at the appropriate DBS satellite(s) from the transmitting antenna of a MVDDS transmit station. 47 CFR § 101.105(a)(4)(ii)(A).

¹⁶ The Commission established different EPFD limits in four regions of the U.S., see 47 CFR § 101.105(a)(4)(ii)(B), mainly due to differences in rainfall in each region. See, e.g., *MVDDS Second Report & Order*, 17 FCC Rcd at 9691, para. 197.

¹⁷ See 47 CFR § 101.1440(a).

¹⁸ See 47 CFR § 101.1440(b).

¹⁹ See 47 CFR § 101.1440(g).

²⁰ See 47 CFR §§ 101.1440(e) & (g).

²¹ See, e.g., *MVDDS Second Report & Order*, 17 FCC Rcd at 9640-9663 paras. 67-125, 9691-92, 198; see also 47 CFR § 2.1 (defining harmful interference).

9. The Commission also enabled sharing between co-primary NGSO FSS and MVDDS using a combination of technical limitations, information sharing, and first-in-time procedures.²² Specifically, these two services gain priority based on a first-in-time, first-in-right approach, under which NGSO FSS receivers and MVDDS transmitting systems are afforded priority in the 12 GHz band portion of spectrum *vis-à-vis* each other based on which deployed earlier.²³

10. Most recently, in 2016 and 2017, proponents of a new generation of NGSO FSS systems sought Commission authority for planned constellations of hundreds or thousands of small satellites using several frequency bands, including the 12 GHz band, and in 2017, the Commission updated its rules to enable the deployment of these emerging systems.²⁴

11. Today, two U.S.-licensed DBS providers, DISH Network L.L.C. (DISH) and DIRECTV²⁵ use the band throughout the US to provide DBS directly from geostationary-orbit (GSO) satellites to relatively small dish antennas at tens of millions of individual homes and businesses. DIRECTV and DISH Network had over 22 million combined subscribers as of the third quarter of 2020.²⁶ Meanwhile, eight companies (10 legal entities) currently hold 191 of 214 MVDDS licenses.²⁷

12. In April 2016, the MVDDS 5G Coalition, which included eleven of the twelve MVDDS licensees at that time, filed a Petition for Rulemaking requesting reforms to the rules for the 12 GHz band.²⁸ The Petition seeks commencement of a rulemaking proceeding to: (i) add a Mobile allocation at 12.2-12.7 GHz to the Non-Federal Table of Frequency Allocations, (ii) delete or demote to secondary the “unused” NGSO FSS allocation in this band from the Non-Federal Table of Frequency Allocations, (iii) allow MVDDS licensees to provide two-way, point-to-point or mobile broadband service, (iv) eliminate the MVDDS effective isotropic radiated power (EIRP) limit, and (v) seek comment on easing the four regional equivalent power flux density (EPFD) limits.²⁹

²² See 47 CFR §§ 101.113(a) n.11; 101.147(p).

²³ See 47 CFR § 101.103(f)(1); see also 47 CFR §§ 101.105(a)(4)(i) (limiting the PFD level beyond 3 km from an MVDDS station to -135 dBW/m² in any 4 kHz measured and/or calculated at the surface of the earth), 101.129(b) (prohibiting location of MVDDS transmitting antennas within 10 km of any qualifying NGSO FSS receiver absent mutual agreement of the licensees).

²⁴ See *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809 (2017) (*recon. pending*).

²⁵ DIRECTV became a subsidiary of AT&T in July 2015. See, e.g., *Applications of AT&T, Inc. and DIRECTV for Consent to Assign or Transfer Control of Licenses and Authorizations*, MB Docket No. 14-90, Memorandum Opinion and Order, 30 FCC Rcd 9131 (2015). Herein we refer to AT&T and DIRECTV interchangeably.

²⁶ See S&P Market Intelligence, *Multichannel Operators by DMA* (Q3 2020).

²⁷ The remaining 23 licenses automatically terminated for failure to meet the buildout requirement. See *Requests of Three Licensees of 22 Licenses in the Multichannel Video and Data Distribution Service for Extension of Time to Meet the Final Buildout Requirement for Providing Substantial Service under Section 101.1413 of the Commission’s Rules, Applications of Three Licensees for Renewal of 22 Licenses in the Multichannel Video and Data Distribution Service*, Order, 33 FCC Rcd 10757 (WTB BD Oct. 29, 2018). See also Blumenthal DTV LLC, Call Sign WQAR709 (Terminated July 26, 2014).

²⁸ *Petition of MVDDS 5G Coalition Petition for Rulemaking*, RM-11768, filed Apr. 26, 2016 (MVDDS 5G Coalition Petition). See also *Petition for Rulemakings Filed*, Public Notice, Report No. 3042 (May 9, 2016) (Petition Public Notice). In its most recent filing, the Coalition’s members were reported to be: Cass Cable TV, Inc. (Cass Cable), DISH Network L.L.C., Go Long Wireless, LTD. (Go Long Wireless), MDS Operations, Inc., MVD Number 53 Partners, Satellite Receivers, Ltd., SOUTH.COM LLC, Story Communications, LLC, and Vision Broadband, LLC (Vision Broadband). See Letter from Chad Winters, Cass Cable, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1 (filed May. 28, 2019) (MVDDS 5G Coalition May 28, 2019 *Ex Parte*). We note that MDS Operations subsequently assigned its remaining 60 MVDDS licenses to RS Access.

²⁹ See MVDDS 5G Coalition Petition. See also Petition Public Notice.

13. The Coalition contended that the (then) 15 year-old MVDDS rules did not account for the “urgent national priority” to make additional spectrum available for 5G mobile services or the intervening technological developments that would now make it feasible to provide two-way mobile broadband services in the band while simultaneously protecting DBS from harmful interference.³⁰ The Coalition stated that “5G services have unique attributes that facilitate sharing in high frequency bands, such as the MVDDS band, since they can be used in a localized way to provide capacity relief in urban canyons and indoors.”³¹ In conjunction with its Petition, the Coalition provided two Coexistence Studies that it claimed illustrate that the new rules it was proposing would protect DBS operators in the band but that they would be incompatible with NGSO FSS.³²

14. In the intervening four years, the Commission has taken action to make additional spectrum available for 5G services.³³ In 2020, the Commission initiated a proceeding to consider rule changes to allow the provision of 5G backhaul and broadband to ships and aircraft in motion in the 70/80/90 GHz bands.³⁴ Additionally in 2020, the Commission took action to make available 280 megahertz of 3.7-4.2 GHz band spectrum while relocating existing satellite operations to the upper part of the band.³⁵ Also in 2020 the Commission modernized certain rules governing the 800 MHz³⁶ and took

³⁰ See MVDDS 5G Coalition Petition at 17-18; MVDDS 5G Coalition Reply at 3.

³¹ MVDDS 5G Coalition Reply at 3. The Coalition notes that, “with the emergence of 5G, higher spectrum bands can be used to provide much needed broadband capacity relief using targeted, small cell deployments (such as in buildings and at urban street level locations) that present a lower interference potential than traditional wide-area macrocell deployments in lower frequency bands. Additionally, advanced antenna techniques like “beamforming” and “beamsteering” allow better control of transmitter energy, enabling transmissions to be more narrowly focused to desired locations (and away from receivers with which they might interfere) dynamically.” MVDDS 5G Coalition Petition at 18.

³² MVDDS 5G Coalition Comments, Attach. 1, MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence (Coexistence 1) and MVDDS 5G Coalition Reply, Appx. A, MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence II (Coexistence 2) (collectively, Coexistence Studies).

³³ Since the Petition was filed in 2016, the Commission has taken action in several proceedings to make more than six gigahertz of spectrum available for 5G service, including 4,950 megahertz of high-band spectrum, over 500 megahertz of mid-band spectrum, and several swaths of low-band spectrum. See e.g., *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, et al, Notice of Proposed Rulemaking and Order, 35 FCC Rcd 6039 (2020); *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Report and Order, 35 FCC Rcd 3852 (2020); *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, Report and Order, 35 FCC Rcd 5183 (2020); *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, 35 FCC Rcd 4935 (2020); *Incentive Auction of Upper Microwave Flexible Use Service Licenses in the Upper 37 GHz, 39 GHz, and 47 GHz Bands for Next-Generation Wireless Services Closes; Winning Bidders Announced for Auction 103*, Public Notice, 35 FCC Rcd 2015 (2020); *Winning Bidders Announced for Auction of 28 GHz Upper Microwave Flexible Use Service Licenses (Auction 101)*, Public Notice, 34 FCC Rcd 4279 (2019); *Auction of 24 GHz Upper Microwave Flexible Use Service Licenses Closes; Winning Bidders Announced for Auction 102*, Public Notice, 34 FCC Rcd 4296 (2019); *Transforming the 2.5 GHz Band*, Notice of Proposed Rulemaking, 33 FCC Rcd 4687 (2018); *Promoting Investment in the 3550-3700 MHz Band*, Report and Order, 33 FCC Rcd 10598 (2018); *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915 (2018); *Incentive Auction Task Force and Wireless Telecommunications Bureau Grant 600 MHz Licenses*, Public Notice, 33 FCC Rcd 869 (2018). See also Federal Communications Commission, *The FCC's 5G FAST Plan*, <https://www.fcc.gov/5G> (last visited Jan. 7, 2021).

³⁴ *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, et al., Notice of Proposed Rulemaking and Order, 35 FCC Rcd 6039 (2020).

³⁵ *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343 (2020).

³⁶ *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, 35 FCC Rcd 4935 (2020).

action to expand unlicensed broadband opportunities in the 6 GHz band.³⁷ In 2019 the Commission completed Auction 101, licensing 850 megahertz of spectrum for flexible use in the 28 GHz band.³⁸ In Auction 102, the Commission licensed 700 megahertz of spectrum for flexible use in the 24 GHz band.³⁹ In Auction 103 the Commission licensed 3,400 megahertz of spectrum for flexible use in the upper 37 GHz band, the 39 GHz band, and the 47 GHz band.⁴⁰ Also in 2019, the Commission proposed to reconfigure the 900 MHz band to facilitate the development of broadband technologies and services.⁴¹ The Commission has also taken steps to provide new opportunities for innovators and experimenters between 95 GHz and 3 THz.⁴² In 2018, the Commission proposed providing greater flexibility to current EBS licensees and new opportunities to obtain unused spectrum in the 2.5 GHz band⁴³ and changed the rules governing Priority Access Licenses (PALs) to spur 5G investment and deployment in the 3.5 GHz band.⁴⁴ In 2017, the Commission completed Auction 1002, licensing 70 megahertz of spectrum for flexible use in the 600 MHz band.⁴⁵

15. The MVDDS 5G Coalition Petition also preceded a 2016 processing round to accept NGSO FSS applications and petitions for market access in several frequency bands and the Commission's reforms to its NGSO FSS rules.⁴⁶ In 2017, the Commission granted the first of the new generation requests—a petition for market access by WorldVu Satellites Limited (OneWeb) for a planned Low Earth Orbit (LEO) NGSO satellite system of 720 satellites authorized by the United Kingdom in the 10.7-12.7 GHz Band (in addition to several other bands).⁴⁷ The Commission concluded that “the pendency of the MVDDS 5G Coalition’s Petition for Rulemaking was not a sufficient reason to delay or deny these requests to use the band under the existing NGSO FSS allocation and service rules.”⁴⁸ In granting this request, however, the Commission conditioned access to the 12 GHz band on the outcome of the MVDDS 5G Coalition’s Petition and any other rulemaking initiated on the Commission’s own motion.⁴⁹

³⁷ *Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Report and Order, 35 FCC Rcd 3852 (2020).

³⁸ *Winning Bidders Announced for Auction of 28 GHz Upper Microwave Flexible Use Service Licenses (Auction 101)*, Public Notice, 34 FCC Rcd 4279 (2019).

³⁹ *Auction of 24 GHz Upper Microwave Flexible Use Service Licenses Closes; Winning Bidders Announced for Auction 102*, Public Notice, 34 FCC Rcd 4296 (2019).

⁴⁰ *Incentive Auction of Upper Microwave Flexible Use Service Licenses in the Upper 37 GHz, 39 GHz, and 47 GHz Bands for Next-Generation Wireless Services Closes; Winning Bidders Announced for Auction 103*, Public Notice, 35 FCC Rcd 2015 (2020).

⁴¹ *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, Report and Order, 35 FCC Rcd 5183 (2020).

⁴² *FCC Opens Spectrum Horizons for New Services & Technologies*, Report and Order, 34 FCC Rcd 1605 (2019).

⁴³ *Transforming the 2.5 GHz Band*, Notice of Proposed Rulemaking, 33 FCC Rcd 4687 (2018).

⁴⁴ *Promoting Investment in the 3550-3700 MHz Band*, Report and Order, 33 FCC Rcd 10598 (2018).

⁴⁵ *Incentive Auction Task Force and Wireless Telecommunications Bureau Grant 600 MHz Licenses*, Public Notice, 33 FCC Rcd 869 (2018).

⁴⁶ *See Satellite Policy Branch Information; OneWeb Petition Accepted for Filing (IBFS File No. SAT-LOI-20160428-00041), Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 10.7-12.7 GHz, 14.0-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-28.35 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz Bands*, Public Notice, 31 FCC Rcd 7666 (IB July 15, 2016).

⁴⁷ *See WorldVu Satellites Limited, Petition for Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, Order and Declaratory Ruling, 32 FCC Rcd 5366 (2017) (*OneWeb Order*).

⁴⁸ *Id.* at 5369 para. 6.

⁴⁹ *Id.* at 5378, para. 26 (“This grant of U.S. market access and any earth station licenses granted in the future are subject to modification to bring them into conformance with any rules or policies adopted by the Commission in the (continued....)”).

The Commission also agreed with comments of the MVDDS 5G Coalition that MVDDS should not have to protect any non-fixed NGSO-FSS operations in the band, if authorized in the future, because such operations had not been contemplated under the longstanding first-in-time MVDDS/NGSO FSS sharing approach.⁵⁰

16. The Commission subsequently granted five additional NGSO FSS requests to use bands that include 12 GHz band (among others).⁵¹ Each grant is subject to modification to bring it into conformance with any rules or policies adopted by the Commission in the future; the market-access grants to Space Norway, Kepler, and Theia also state that this condition includes any earth station licenses granted in the future. In all but the *Space Norway Order*, the Commission expressly stated that the any investments made toward operations in the bands authorized in the United States assume the risk that operations may be subject to additional conditions or requirements as a result of any future Commission actions, and all of the orders directly or indirectly referenced the MVDDS 5G Coalition Petition.⁵² Parties disagree about the scope and applicability of these conditions.⁵³

17. Since the Commission granted these requests, OneWeb, Kepler Communications (Kepler) and SpaceX have launched the first satellites of their authorized constellations and additional launches are scheduled in 2021.⁵⁴ To date, OneWeb has launched 110 satellites⁵⁵ and Kepler has

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future.”). *See also id.* at 5369, para. 6 (“Accordingly, any investment made toward operations in this band by OneWeb in the United States assume the risk that operations may be subject to additional conditions or requirements as a result of such Commission actions.”).

⁵⁰ *Id.* at 5370 para. 8.

⁵¹ *Space Norway AS, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the Arctic Satellite Broadband Mission*, Order and Declaratory Ruling, 32 FCC Rcd 9649 (2018) (*Space Norway Order*); *Karousel Satellite LLC, Application for Authority to Launch and Operate a Non-Geostationary Earth Orbit Satellite System in the Fixed Satellite Service*, Memorandum Opinion, Order and Authorization, 33 FCC Rcd 8485 (2018) (*Karousel Order*); *Space Exploration Holdings, LLC Application For Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, Memorandum Opinion Order and Authorization, 33 FCC Rcd 3391 (2018) (*SpaceX Order*); *Kepler Communications Inc. Petition for Declaratory Ruling to Grant Access to the U.S. Market for Kepler's NGSO FSS System*, Order, 33 FCC Rcd 11453, (2018) (*Kepler Order*); *Theia Holdings A, Inc. Request for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Fixed-Satellite Service, Mobile-Satellite Service, and Earth-Exploration Satellite Service*, Memorandum, Opinion and Authorization, 34 FCC Rcd 3526 (2019) (*Theia Order*).

⁵² *See Space Norway Order*, 32 FCC Rcd at 9655, 9611, paras. 13, 27 (2017); *Karousel Order*, 33 FCC Rcd at 8486-87, paras. 3, n.14, 25(v) (2018); *SpaceX Order*, 33 FCC Rcd at 3399, 3401-02, 3407, paras. 19, 26, 40(r) (2018); *Kepler Order*, 33 FCC Rcd at 11455, 11462-63, paras. 4-5, 29 (2018); *Theia Order*, 34 FCC Rcd at 3539-40, 3548, paras. 36, 58 (2019).

⁵³ Space Exploration Technologies Corp. (SpaceX) argues that its authorizations are not conditional in 12 GHz band. *See, e.g.*, Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2 (filed Nov. 5, 2020) (SpaceX Nov. 5, 2020 *Ex Parte*). DISH argues that “every . . . Ku-band authorization is conditioned on the outcome of the 12 GHz petition.” Letter from Jeffrey H. Blum, Executive Vice President, External and Legislative Affairs, DISH, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2 (filed Nov. 12, 2020) (DISH Nov. 12, 2020 *Ex Parte*); *see also id.* at 1-2 citing *SpaceX Order*, 33 FCC Rcd 3391, n.88.

⁵⁴ For example, SpaceX’s Transporter-1 rideshare mission, currently scheduled for January 21, 2021 will include ten additional SpaceX Starlink satellites and a Kepler GEN1 satellite. *See, e.g.*, <https://everydayastronaut.com/transporter-1/> (“Liftoff time (subject to change) is Jan. 21, 2021, for Transporter-1, SpaceX’s first dedicated rideshare mission”).

⁵⁵ OneWeb has completed four launches for a total of 110 satellites. The fourth launch for 36 satellites occurred post-bankruptcy on December 18, 2020. *See* <https://www.oneweb.world/media-center/onewebs-successful-launch-paves-the-way-for-commercial-services>; <https://spacenews.com/oneweb-resumes-satellite-deployment-with-soyuz-launch/>.

launched 2 satellites.⁵⁶ SpaceX has deployed more than 900 satellites that use the 12 GHz band among other bands, which now makes it the largest satellite constellation in the world.⁵⁷ In addition, through the Commission's Rural Digital Opportunity Fund reverse auction, SpaceX received \$88.5 million in annual support for ten years (or \$885 million total) to provide broadband service to 642,925 locations.⁵⁸ SpaceX claims that its service is capable of providing downlink/uplink speeds of 103/42 megabits-per-second and a consistently observed median latency of 30 milliseconds.⁵⁹

18. In its most recent filing, the MVDDS 5G Coalition continues to ask the Commission to consider modernizing MVDDS rules and to protect MVDDS interests in the band.⁶⁰ While the MVDDS 5G Coalition originally contended that 5G terrestrial use and NGSO FSS use are incompatible, other proponents of flexible use (such as two-way mobile)—including some of the members of the MVDDS 5G Coalition—recently have suggested the possibility of sharing in the band.⁶¹ Meanwhile, OneWeb, AT&T Services, Inc. (AT&T), SpaceX, Intelsat License LLC (Intelsat), SES S.A. (SES), Kepler, and others contend that sharing remains impossible between NGSO FSS and terrestrial two-way mobile operations.⁶²

III. DISCUSSION

19. The Commission has long been committed to ensuring that spectrum is put to its highest and best use. As such, we commence this rulemaking proceeding to consider whether the current rules for the use of 12 GHz best serve the public interest. As a threshold matter, therefore, we seek comment on how to weigh the spectrum the Commission has already made available for 5G over the past four years and the hundreds of satellites that have been launched by the NGSO FSS operators in considering whether it is technically feasible to add additional or expanded spectrum rights in the 12 GHz band without causing harmful interference to incumbent licensees (and, if so, whether a balancing of public interest benefits would support taking that step). In the sections below, we seek comment on two potential

⁵⁶ See, e.g., <https://www.keplercommunications.com/newsroom/press-releases/post/kepler-communications-announces-successful-launch-of-new-gen1-satellites>; <https://spacenews.com/kepler-launches-first-internally-produced-satellites/>.

⁵⁷ In a March 2020 NGSO FSS processing round, these four companies filed additional applications to use the 12 GHz band. See SpaceX, SAT-LOA-20200526-00055; OneWeb, SAT-MPL-20200526-00062; New Spectrum Satellite, SAT-LOA-20200526-00060; Kepler, SAT-PDR-20200526-00059. These companies have also filed several applications for earth stations. See, e.g., SpaceX Application File No. SES-LIC-20190211-00151; SpaceX File Nos. SES-LIC-20190402-00425, SES-LIC-20190402-00426, SES-LIC-20190402-00427, SES-LIC-20190402-00450, SES-LIC-20190402-00451, SES-LIC-20190405-00453; OneWeb Application File No. SES-LIC-20190930-01217; OneWeb Application File No. SES-LIC-20190930-01237.

⁵⁸ *Rural Digital Opportunity Fund Phase I Auction (Auction 904) Closes: Winning Bidders Announced*, Public Notice, 35 FCC Rcd 13888, Appx. A. (2020).

⁵⁹ See Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, Attach., SpaceX Starlink Update, at 3 (filed Oct. 15, 2020) (SpaceX Oct. 15, 2020 *Ex Parte*).

⁶⁰ See MVDDS 5G Coalition May 28, 2019 *Ex Parte* at 2.

⁶¹ See e.g., Letter from Martha Suarez, President, Dynamic Spectrum Alliance (DSA), to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2 (filed Aug. 21, 2020) (DSA Aug. 21, 2020 *Ex Parte*); Letter from Trey Hanbury, Counsel, RS Access, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2-3 (filed Sept. 21, 2020) (RS Access Sept. 21, 2020 *Ex Parte*); DISH Nov. 12, 2020 *Ex Parte* at 4 (stating that “since the 2016 studies, developments in the satellite industry indicate that NGSO FSS constellations possess geostationary-like functions and properties that could prove more compatible with 5G services in the 12 GHz Band than the last-generation NGSO earth stations.”).

⁶² See e.g., Letter from Ruth Pritchard-Kelly, Vice President of Regulatory Affairs, OneWeb *et al.* (“12 GHz Operators”), to Marlene H. Dortch, Secretary, FCC (filed Oct. 20, 2020) (12 GHz Operators Oct. 20, 2020 *Ex Parte*).

approaches to future use of the 12 GHz band: increasing terrestrial use of the shared band or continuing with the current framework. We seek comment on each approach, including the costs and benefits, in order to pursue the Commission's goals of putting spectrum to its highest-value and most efficient use while protecting incumbent operations in the band from harmful interference.

A. Enhanced Opportunities for Shared Use of the Band

20. First, we seek comment on whether we can increase opportunities for shared use of the band while protecting incumbents from harmful interference. The MVDDS 5G Coalition argues that technological advances since the creation of MVDDS in 2000 justify revisiting the rules for terrestrial use of the band. Specifically, the MVDDS 5G Coalition asserts that terrestrial flexible use service is compatible with DBS service due to technological advances, such as targeted small-cell deployments and advanced antenna techniques like beamforming and beamsteering, which allow better control of transmitter energy and therefore can protect DBS.⁶³ Other proponents of terrestrial, flexible use of the band similarly argue that developments since the MVDDS Petition was submitted in 2016 open up the possibility of coexistence between DBS, terrestrial flexible use, and NGSO FSS operations, and they maintain that the complex technical issues this raises warrant a new Commission rulemaking.⁶⁴ As such, we seek comment on adding a mobile service allocation throughout the 12 GHz band, whether coexistence between and among these competing services is technically achievable and, if so, what mechanisms the Commission might consider in facilitating such coexistence.

21. We note that section 303(y) provides the Commission with authority to provide for flexible use operations only if: "(1) such use is consistent with international agreements to which the United States is a party; and (2) the Commission finds, after notice and opportunity for public comment, that (A) such an allocation would be in the public interest; (B) such use would not deter investment in communications services and systems, or technology development; and (C) such use would not result in harmful interference among users."⁶⁵ We seek comment on whether adding a mobile allocation to the 12 GHz band to allow flexible, terrestrial use is consistent with this provision.⁶⁶ In particular, we seek information on the status of technologies that have been developed or are currently in development that would allow for two-way mobile communications in the 12 GHz band, whether standards have been set related to such technologies, whether there are any international agreements on a band plan or air

⁶³ MVDDS 5G Coalition Petition at 17-18.

⁶⁴ See Letter from Jeffrey H. Blum, Executive Vice President, External and Legislative Affairs, DISH, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1-2 (filed Oct. 27, 2020) (DISH Oct. 27, 2020 *Ex Parte*); DSA Aug. 21, 2020 *Ex Parte* at 2; Letter from Jennifer M. McCarthy, Vice President, Legal Advocacy, Federated Wireless, Inc., to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2 (filed June 15, 2020) (Federated Wireless June 15, 2020 *Ex Parte*); Letter from Harold Feld, Senior Vice President, Public Knowledge, *et al.*, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 5 (filed July 9, 2020) (Public Knowledge July 9, 2020 *Ex Parte*); Letter from V. Noah Campbell, CEO, RS Access, LLC (RS Access) to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 5-6 (filed Aug. 6, 2020) (RS Access Aug. 6, 2020 *Ex Parte*); Letter from Kevin Ross, CEO, WeLink Communications, LLC (WeLink) to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1 (filed June 26, 2020) (WeLink June 26, 2020 *Ex Parte*).

⁶⁵ Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat 251, 268-69 sec. 3005 Flexible Use of Electromagnetic Spectrum (codified at 47 U.S.C. § 303(y)). See also 47 CFR §§ 2.106, 27.2, 27.3.

⁶⁶ We note the 12 GHz band has not been proposed at the International Telecommunication Union (ITU) for 5G or International Mobile Telecommunications (IMT) use at this time. Intelsat Opposition at 3; MVDDS 5G Coalition Reply at 6; Letter From Grover G. Norquist, President, Americans for Tax Reform, *et al.*, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3 (filed Oct. 16, 2020) (ATR Oct. 16, 2020 *Ex Parte*); Letter from Thomas A. Schatz, President, Citizens Against Government Waste, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3 (filed Oct. 22, 2020) (CAGW Oct. 22, 2020 *Ex Parte*). We seek comment on the pertinence of this observation.

interface for the 12 GHz band, and the impact (if any) on international rights for U.S.-licensed systems that might be affected as a result of our providing for expanded shared use of the band.⁶⁷

1. Protecting Satellite Incumbents from Harmful Interference

22. We seek comment on the technical parameters that could allow additional terrestrial use of the band without causing harmful interference to incumbent operators. Among other things, we seek comment on whether we should allow two-way communications and flexible use of the band as well as what technical parameters would be appropriate for such new terrestrial operations. For example, assuming existing MVDDS service rules as the baseline, should we eliminate or modify the EIRP restriction for terrestrial operators of 14.0 dBm per 24 megahertz (−16.0 dBW per 24 megahertz)?⁶⁸

23. *Protecting DBS Operations.* The MVDDS 5G Coalition and others assert that coexistence is feasible between those conducting two-way mobile operations and existing and future DBS receivers. They maintain that terrestrial operators could apply existing technology profiles and newly available ultra-high resolution imagery, neither of which was available in 2002, with modest adjustments to terrestrial site locations and radio frequency design parameters.⁶⁹ We seek comment on whether, and to what extent, the MVDDS 5G Coalition’s proposed licensing of two-way, mobile operations in the band, and its proposed elimination of the EIRP limit, would substantially redefine the scope of DBS operators’ obligations and potential burdens under the current regime. If flexible use is authorized in the band, should the burden of avoiding or correcting for interference to existing or future DBS subscribers be revised? Or should two-way and/or mobile licensees be subject to the same requirements for protecting DBS subscribers that currently apply to other services in the band? How could other factors—such as geographic separation, transmitter power constraints on terrestrial operations, and other siting parameters for flexible-use base stations—minimize the risk of interference to DBS users?⁷⁰

24. The MVDDS 5G Coalition asserts that sharing between two-way, higher EIRP mobile operations and DBS is possible through careful selection of areas to deploy mobile broadband, modest adjustments to radiofrequency design parameters, elimination of interference through geographic separation, absorption in the clutter, transmitter power constraints on terrestrial operations, and other

⁶⁷ See Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, Attach. A, Questions Necessary to Balance the 12 GHz NPRM, at 3-4 (filed Jan. 6, 2021) (SpaceX Jan. 6, 2021 *Ex Parte*).

⁶⁸ See 47 CFR §§ 101.113(a) n.11; 101.147(p).

⁶⁹ MVDDS 5G Coalition Petition at 1-2; MVDDS 5G Coalition Comments at 2 (quoting Coexistence 1 at 35). See also Letter from Jeffrey H. Blum, Executive Vice President, External and Legislative Affairs, DISH to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3 (filed Sept. 22, 2020) (DISH Sept. 22, 2020 *Ex Parte*) (stating coexistence between terrestrial mobile 5G services and DBS is possible by designing a network that meets reasonable EPFD limits for both base stations and mobile devices); Letter from Go Long Wireless, et al., to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1, 7 (filed Aug. 14, 2020) (Go Long Wireless, et al. Aug. 14, 2020 *Ex Parte*) (supporting contention that DBS and flexible-use MVDDS can co-exist on an interference-free basis and arguing that comment should be sought on coexistence through an NPRM).

⁷⁰ See, e.g., DISH Sept. 22, 2020 *Ex Parte* at 3. See also MVDDS 5G Coalition Comments, Coexistence 1 at 35 (finding that “coexistence between MVDDS 5G operations and DBS receivers is possible with modest adjustments to MVDDS site locations and radiofrequency design parameters”); MVDDS 5G Coalition Reply, Coexistence 2 (revalidating the original coexistence study in different topological use-cases); MVDDS 5G Coalition Petition to Deny, IBFS File No. SAT-LOI-20160428-00041, RM-11768, GN Docket No. 14-177, IB Docket No. 15-256, RM-11664, WT Docket No. 10-112, IB Docket No. 97-95, Attach., MVDDS 12.2-12.7 GHz NGSO Coexistence Study (Coexistence 3) (rec. Aug. 15, 2016).

mechanisms.⁷¹ We seek comment on whether such an approach is feasible, both as a technical and a practical manner. We seek comment on the costs and benefits of such an approach.

25. The MVDDS 5G Coalition also suggests that keeping terrestrial signals below the applicable EPFD limit at all DBS antenna locations generally could avoid harmful interference to existing DBS subscribers regardless of the EIRP or whether the operations are fixed or mobile, or one- or two-way.⁷² Do commenters agree? AT&T notes that DBS customers can install dishes anywhere on their premises and sometimes even on moving vehicles,⁷³ and that DBS operators do not have access to granular location data for their receive terminal installations. Does the Coalition's proposed solution resolve that concern? Can cell-site EIRP or location be engineered to mitigate any potential interference? What are appropriate EIRP considerations for base and mobile stations? Given that all DBS earth stations look toward the southern sky for communication with GSO space stations orbiting at the equatorial plane, and given that high-gain antennas are necessary for base stations, can base station location and/or antenna orientation be situated to provide greater protection to DBS earth stations? What is the impact of base station height with respect to interference? Will lower base station height reduce the potential for interference to both DBS and NGSO? What are the potential costs associated with this solution?

26. AT&T counters that although one-way services currently permitted under MVDDS licenses may coexist with DBS, two-way mobile service would create an untenable interference environment for DBS subscribers.⁷⁴ Specifically, AT&T contends that enabling two-way, mobile use—which would include transient signals from unpredictable locations and angles—would make it impossible to model and avoid interference to DBS receivers, and that it would be “exceptionally difficult for the DBS operator to trace or identify” the cause of interference as the signal moved.⁷⁵ We seek comment on this view.

27. *Protecting NGSO FSS Operations.* SpaceX asserts the technical studies submitted by the MVDDS 5G Coalition demonstrate that “while coexistence between DBS and 5G MVDDS would prove feasible within limits, coexistence between NGSO FSS and 5G MVDDS would not prove feasible,

⁷¹ Letter from Tim Davies, Braunston Spectrum LLC, *et al.* (MVDDS 5G Coalition), to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2-3 (Aug. 29, 2018) (MVDDS 5G Coalition August 29, 2019 *Ex Parte*). “The Peters studies never claim that terrestrial mobile 5G can be deployed in all locations, and in fact they emphasize several times that careful radio-frequency engineering will be required to avoid interference to DBS. Sharing through careful site selection is, in other words, one of the foundations of the Coalition’s proposal to use the 12 GHz band more intensively for next-generation two-way operations.” MVDDS 5G Coalition August 29, 2019 *Ex Parte* at 3.

⁷² See MVDDS 5G Coalition Petition at 19; MVDDS 5G Coalition Comments at 6 & n.21 (citing Coexistence 1 at 4). AT&T had argued that there may be potential statutory issues including whether proposed two-way, mobile use of the band would require an independent technical analysis showing that DBS would be protected. AT&T Opposition at 2 & n.4 (citing Section 1012 of the LOCAL TV Act). In December 2018, however, this provision of the LOCAL TV Act was stricken. Pub. L. 106-553, 114 Stat. 2762, 265-66 sec. 1012 Prevention of Interference to Direct Broadcast Satellite Services, *stricken by* Pub. L. 115-334, 132 Stat. 4490, 4777-78 sec. 6603 Amendments to Local TV Act.

⁷³ Letter from Michael P. Goggin, Assistant Vice President, Senior Legal Counsel, AT&T, to Marlene H. Dortch, Secretary, FCC, RM-11768, at 2 (filed Oct. 16, 2020) (AT&T Oct. 16, 2020 *Ex Parte*).

⁷⁴ *Id.* at 1; Letter from Michael P. Goggin, Assistant Vice President, Senior Legal Counsel, AT&T, to Marlene H. Dortch, Secretary, FCC, RM-11768, at 1 (filed Aug. 6, 2020) (AT&T Aug. 6, 2020 *Ex Parte*). See also Letter of Patrick R. Halley, Senior Vice President, Policy & Advocacy, USTelecom, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1 (filed Oct. 21, 2020) (USTelecom Oct. 21, 2020 *Ex Parte*).

⁷⁵ Letter from Michael P. Goggin, Assistant Vice President, Senior Legal Counsel, AT&T, to Marlene H. Dortch, Secretary, FCC, RM-11768, at 4 (filed June 14, 2018) .

without substantial constraints on one or both services,”⁷⁶ and that “MVDDS licensees cannot deploy two way 5G services in the 12.2-12.7 GHz band without overwhelming NGSO FSS operations, even under the current rules, notwithstanding new 5G deployment architectures and newly available high-resolution ground-obstacle data.”⁷⁷ SpaceX also points out that one such 2016 study assumes “an overly optimistic 30dB of NGSO user antenna discrimination toward the horizon and still determines that extreme interference (C/I = 0dB) into the NGSO receiver will occur from a single 5G mobile device that is 1,000 meters away operating at EIRP of 23dBm per 24MHz in free space conditions.”⁷⁸ SpaceX argues that “[e]xtending this analysis to a more relevant threshold of I/N of -6 to -12dB yields the conclusion that a single 5G mobile device could cause interference at a distance of greater than 10km in free space conditions,” and that “[m]ore than one 5G mobile device in the vicinity would increase this distance.”⁷⁹ Accordingly, SpaceX asks how DISH would ensure that its 5G mobile users are always tens of kilometers from the nearest NGSO user antenna on the ground, or approximately 10 kilometers away for single 5G mobile devices, with larger separation distances necessary for multiple 5G devices?⁸⁰ Furthermore, it asks if such separation distances are really a practical solution as NGSO FSS users become ubiquitously deployed in the near future?⁸¹ Finally, it inquires if under this scheme, 5G operations in an area would cease operations if notified by an NGSO operator of observed interference?⁸²

28. DISH asserts that technological developments in the satellite industry may have increased the degree to which NGSO FSS constellations and flexible use, including two-way mobile service, may coexist. Specifically, DISH maintains that current-generation NGSO FSS constellations possess geostationary-like functions and properties that could prove more compatible with flexible use than last-generation NGSO earth stations.⁸³ DISH asserts that to the extent NGSO FSS satellites maintain a highly elliptical orbit and time their active operations to align with the perigee of their orbit in a manner intended to simulate the operation of a GSO system,⁸⁴ such operations presumably would be in a better position to coexist with flexible use operations than a standard NGSO FSS system.⁸⁵ DISH further contends that, given the large number of satellites contemplated by these systems, an NGSO FSS antenna should be expected to operate with a much narrower field of view as opposed to one encompassing all realistic azimuths and elevation angles.⁸⁶ Thus, DISH asserts that, at some level of concentration, large numbers of NGSO FSS satellites could operate for interference purposes like fixed DBS licensees, because the

⁷⁶ Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3 (filed July 10, 2020) (SpaceX July 10, 2020 *Ex Parte*) (citing MVDDS 5G Coalition Reply, Coexistence 2 at 1).

⁷⁷ *Id.* (citing MVDDS 5G Coalition Comments, Coexistence 1 at 2).

⁷⁸ SpaceX Jan. 6, 2021 *Ex Parte* at 5. See MVDDS 5G Coalition Comments, Coexistence 1 at 33 (stating that “[w]hile the NGSO receiver may have a directional, upward-facing antenna that provides some protection from the emissions of the 5G mobile UE, even 30 dB of antenna discrimination by the NGSO receiver would still require more than a kilometer of separation distance between the 5G mobile device and the NGSO receiver when the 5G mobile device was operating with an EIRP of 23 dBm per 24 MHz.”)

⁷⁹ SpaceX Jan. 6, 2021 *Ex Parte* at 5.

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Id.*

⁸³ DISH Nov. 12, 2020 *Ex Parte* at 3.

⁸⁴ A highly elliptical orbit is a highly eccentric orbit with a low perigee and a high apogee. Perigee is the point in a satellite’s orbit closest to the earth, while apogee is the point in orbit farthest from the earth. The orbital pattern follows the curve on an ellipse.

⁸⁵ DISH Nov. 12, 2020 *Ex Parte* at 4.

⁸⁶ *Id.*

receiving earth stations would be directed at a limited number of proximate points in low-Earth orbit instead of at a nearly limitless array of different points throughout the sky.⁸⁷

29. We seek comment on the technical analyses submitted to date, as well as further information and studies related to the feasibility, costs, and benefits of sharing among these services.⁸⁸ To what extent do NGSO satellite systems operate in a manner described by DISH? In other words, do all NGSO systems operate in highly elliptical orbits or with earth stations pointed toward fixed locations in the sky? If not, are there plans for NGSO system operators to modify their systems in this manner? What would be the implication on latency for end users if NGSO FSS systems were modified to highly elliptical orbits? What is the practical range of azimuth and elevation angles over which NGSO earth stations are expected to operate? SpaceX notes that existing NGSO FSS systems are authorized to operate down to 10-degree elevation angles in the U.S. and questions whether terrestrial uses could be added to the band while still protecting NGSO licensees that use these elevation angles.⁸⁹ What level of NGSO FSS satellite concentration would ensure that NGSO receiving earth stations would be directed at a limited number of proximate points in low-Earth orbit? How many earth stations do NGSO operators expect to deploy? What methods can base and mobile stations use to avoid causing harmful interference to NGSO receive stations? Commenters that contend that coexistence is feasible should address whether, given the existing technical rules, sufficient spectrum will be available to support new terrestrial service and describe the potential costs associated with any solution.

30. We note that NGSO interests and various other parties argue that expanding terrestrial rights to include flexible use, including two-way, mobile service in the 12 GHz band, could create harmful interference that would jeopardize their offerings, and undermine the investments that they have made in the band.⁹⁰ We seek comment on the appropriate technical criteria that would be necessary to protect NGSO FSS from harmful interference from higher-power, two-way mobile operations. Would the existing interference criteria in the MVDDS rules be sufficient?⁹¹ How would an NGSO FSS operator or subscriber identify the source of any interference received in the event that mobile operations are authorized in the band?⁹² SpaceX argues that, because the Commission has permitted blanket

⁸⁷ *Id.*

⁸⁸ See generally SpaceX Jan. 6, 2021 *Ex Parte* (includes SpaceX's technical questions about the proposals made by the MVDDS licensees and the record developed in RM-11768).

⁸⁹ *Id.* Attach. A at 4.

⁹⁰ See Letter from Paul Caritj, Counsel, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1-2, 5 (filed July 31, 2020) (SpaceX July 31, 2020 *Ex Parte*); Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3-4 (filed July 22, 2020); 12 GHz Operators Oct. 20, 2020 *Ex Parte* at 2, 2-3; ATR Oct. 16, 2020 *Ex Parte* at 2, 3; CAGW Oct. 22, 2020 *Ex Parte* at 4; Letter from Thomas Sanford, Executive Director, Commercial Spaceflight Federation, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2-3 (filed Nov. 16, 2020) (Commercial Spaceflight Federation Nov. 16, 2020 *Ex Parte*); Letter from Betsy Huber, President, National Grange of the Order of Patrons of Husbandry, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1-2 (filed Nov. 16, 2020); Letter from Andrew Lautz, Policy and Government Affairs Manager, National Taxpayers Union, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3 (filed Oct. 20, 2020) (National Taxpayers' Union Oct. 20, 2020 *Ex Parte*); Letter from Brian D. Weimer, Counsel, OneWeb, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2 (filed Oct. 19, 2020); Letter from James E. Dunstan, General Counsel, TechFreedom, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 6, 9 (filed Oct. 8, 2020); Letter from Patrick R. Halley, Senior Vice President, Policy and Advocacy, USTelecom to Marlene H. Dortch, Secretary FCC at 1 (filed Oct. 21, 2020).

⁹¹ See 47 CFR §§ 101.113(a) n.11, (f)(1); 101.147(p). See also 47 CFR §§ 101.105(a)(4)(i) (limiting the PFD level beyond 3 km from an MVDDS station to -135 dBW/m² in any 4 kHz measured and/or calculated at the surface of the earth), 101.129(b) (prohibiting location of MVDDS transmitting antennas within 10 km of any qualifying NGSO FSS receiver absent mutual agreement of the licensees).

⁹² SpaceX Jan. 6, 2021 *Ex Parte*, Attach. A at 4.

authorizations for earth stations in the band (enabling millions of consumer earth stations to ubiquitously proliferate), it would be impossible to track these consumer deployments in real-time, much less prevent harmful interference to them by transient and unpredictable mobile operations.⁹³ SpaceX also points out that the sharing studies submitted by the MVDDS Coalition confirm that 5G use would clearly overwhelm NGSO FSS operations.⁹⁴ Given the potential for NGSO FSS operations to provide much needed service in rural and other underserved areas, we seek comment on the costs and benefits of adding terrestrial two-way mobile services to the band.

31. In response to the assertions from SpaceX and other NGSO operators about the potential for harmful interference, DISH argues that NGSO FSS service is not dependent on the 12 GHz band; it contends that, “[i]f the FCC were to repurpose the 12 GHz band for terrestrial 5G services, SpaceX would retain nearly 97% of all spectrum and nearly 94% of all space-to-earth spectrum made available for its proposed NGSO FSS system.”⁹⁵ In response, several NGSO operators argue that the entirety of the two gigahertz of spectrum from 10.7 GHz to 12.7 GHz currently licensed to several NGSO FSS operators for downlink operations is necessary for NGSO FSS deployment.⁹⁶ SpaceX argues there are additional constraints in the other portions of 10.95–12.2; for example, 10.95–11.7 has further non-harmful interference protections due to terrestrial being primary, which could affect consumer earth stations in this portion of the band.⁹⁷ Others argue that harmful interference to NGSO operators in the 500 megahertz of the 12 GHz band would negatively affect NGSO operators’ ability to split equally the remaining 1.5 gigahertz of spectrum during in-line interference events.⁹⁸ We seek comment on these views, but reiterate that we are focused on protecting incumbent licensees, including incumbent NGSO operators, from harmful interference in this proceeding.

32. *Other Technical Means of Protecting Satellite Incumbents.* One additional approach to protecting incumbents would be to restrict new terrestrial operations to indoor use. The Commission has adopted this approach to permit unlicensed devices to share spectrum with licensed services in several bands.⁹⁹ Such indoor devices could be used for providing Internet connectivity as well as connecting Internet-of-things devices in both consumer and industrial applications. The Commission’s Technological Advisory Council 5G/IoT/O-RAN working group recommended that the Commission consider private spectrum for enterprise Internet-of-things devices in locations such as confined geographic areas, buildings, and campuses.¹⁰⁰ Could indoor 12 GHz unlicensed devices meet this need? Would restricting new terrestrial devices to indoor uses enable them to co-exist with satellite services? What power level would the indoor devices need to be limited to avoid causing harmful interference to

⁹³ See generally Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 3 (filed Nov. 6, 2020) (SpaceX Nov. 6, 2020 *Ex Parte*).

⁹⁴ SpaceX July 10, 2020 *Ex Parte* at 2-3.

⁹⁵ Letter from Jeffrey Blum Executive Vice President, External and Legislative Affairs, DISH to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at Attach., Spectrum Available to SpaceX Non-Geostationary Orbit Fixed-Satellite Service (NGSO FSS) (filed July 14, 2020).

⁹⁶ Letter from Brian D. Weimer, Counsel, OneWeb, et al., (12 GHz Operators) to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 2 (filed Oct. 23, 2020) (12 GHz Operators Oct. 23, 2020 *Ex Parte* at 2).

⁹⁷ SpaceX July 31, 2020 *Ex Parte*, Attach., 12 GHz Band at 4.

⁹⁸ 12 GHz Operators Oct. 23, 2020 *Ex Parte*; 47 CFR §§ 25.261(b)-(c).

⁹⁹ 47 CFR § 15.407 (d)(3); *Unlicensed Use of the 6 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852, 3888-89, paras. 98-103(2020); *Use of the 5.850-5.925 GHz Band*, First Report and Order, Further Notice of Proposed Rulemaking, and Order of Proposed Modification, ET Docket No. 19-138, FCC 20-164, para. 61 (adopted Nov. 18, 2020).

¹⁰⁰ Federal Communications Commission Technological Advisory Council Meeting, slide 250 (Dec. 1, 2020) <https://www.fcc.gov/sites/default/files/tac-presentations-12-1-20.pdf>.

satellite services (and would it be materially higher than if we assume outdoor use for the new terrestrial operations)? What would be the costs and benefits of this approach?

2. Assigning New Terrestrial Use Rights

33. We next seek comment on how the Commission should assign any new terrestrial service rights. Given that MVDDS licensees themselves have terrestrial usage rights in large geographic areas across the United States, we seek comment on three approaches to authorize any new terrestrial rights in the band: (1) modifying the licenses of existing licensees under section 316 of the Communications Act, (2) auctioning off overlay licenses in the band, and (3) authorizing underlay use of the band.

34. *First*, should the Commission consider modifying existing incumbent licenses using our section 316 authority to allow increased terrestrial operational flexibility?¹⁰¹ In this band, because there are several types of existing incumbents—DBS, MVDDS, and NGSO—there are several potential options for expanding terrestrial rights. One option would be to expand the rights of existing terrestrial licensees to allow them to provide 5G terrestrial services. For instance, when the Commission authorized mobile use in the 28 GHz band, it granted mobile rights to existing fixed licensees, after finding that such an approach would expedite service, and that separating “fixed” and “mobile” rights into different bundles could create unnecessary complexity and potential for interference.¹⁰² Similarly, the Commission has modified other licenses in the past to increase the flexibility afforded to incumbents to put spectrum to its highest and best use.¹⁰³ Do similar reasons support modifying the MVDDS licenses to incorporate greater flexibility?¹⁰⁴ Or are there distinctions that suggest the Commission should adopt a different approach here?

35. Another option would be to grant flexible terrestrial use rights to the incumbent satellite operators. As SpaceX notes, the Commission granted terrestrial rights to the AWS-4 band to existing satellite licensees based on an assumption that closely coordinated satellite and terrestrial operations would be necessary to overcome interference issues.¹⁰⁵ Would affording flexible use rights to incumbent satellite operators best ensure that these services do not experience harmful interference?

36. Under the current regulatory regime in the band, DBS operators have priority over the other services, including both MVDDS and NGSO licensees. Should the Commission grant flexible terrestrial use rights to DBS licensees based on their priority status? One of the potential challenges to such an approach, however, involves the different ways in which DBS rights and terrestrial rights are generally assigned. While the DBS operators have exclusive rights to transmit from each of their orbital slots, they have non-exclusive rights in terms of geographic coverage (i.e., they jointly share the right to transmit across the United States using the 12.2-12.7 GHz band). In contrast, in order to encourage investment and innovation by terrestrial licensees, the Commission generally assigns new terrestrial use licenses on an exclusive geographic basis. Given that each DBS operator in the band uses the full 12 GHz band on a shared basis with the other DBS operator, if the Commission awarded flexible terrestrial use

¹⁰¹ See Public Knowledge July 9, 2020 *Ex Parte* at 2.

¹⁰² *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, 8031, para. 41 (2016).

¹⁰³ See, e.g., *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands* (2 GHz bands), WT Docket Nos. 12-70 and 04-356, ET Docket No. 10-142, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102, 16220-22, 16224, paras. 319-21, 331-32, (2012) (modifying incumbent MSS licensees to allow widespread terrestrial authorizations); *Amendment of Part 27 of the Commission’s Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, WT Docket No. 07-293, Report and Order and Second Report and Order, 25 FCC Rcd 11710, 11712, 11723, paras. 2, 29 (2010) (modifying rules to enable the deployment of mobile broadband services by incumbent terrestrial licensees).

¹⁰⁴ SpaceX Jan. 6, 2021 *Ex Parte*, Attach. A at 3.

¹⁰⁵ *Id.*

rights to both incumbents, how should the flexible terrestrial use rights be awarded? Could we leave this matter to commercial negotiations between the parties? If so, would such an approach lead to an efficient outcome? If the Commission cannot rely solely on negotiation between the DBS operators, how would it reconcile conflicts between the DBS operators over how to apportion terrestrial rights? We note that, under section 309(j) of the Communications Act of 1934, as amended, if mutually exclusive applications for initial licenses are received, we must use competitive bidding to resolve the mutual exclusivity. We seek comment on whether, and how, the process of negotiating and assigning terrestrial rights to DBS operators could occur without triggering this requirement.

37. Alternatively, the Commission could grant flexible terrestrial use rights to NGSO operators in addition to DBS operators. We note that this option would create at least two complications. First, there would need to be negotiations between a significantly larger number of operators—there are currently only two DBS operators, while there have been six NGSO authorizations granted for use of the 12 GHz band. Second, the apportionment of terrestrial rights would be further complicated by the fact that one set of operators (DBS) currently has superior rights to the other set of operators (NGSO). Could the Commission rely on commercial negotiations to achieve an efficient outcome between these operators, and if not, would it be possible to resolve differences in a manner that both comports with Section 309(j) and achieves an efficient and expeditious outcome?

38. *Second*, should we auction overlay licenses for the band? Some commenters argue that this approach would ensure that the new flexible-use licenses are assigned to entities that are capable of rapidly deploying in the band.¹⁰⁶ If we were to adopt this overlay license approach, we expect that new licensees would not be able to deploy operations that would cause harmful interference to incumbent operations absent an agreement to the contrary. What rights, if any, should overlay licensees have to relocate incumbent operations? Specifically, should we authorize only voluntary relocation of incumbent operations, either for a limited period or in perpetuity?¹⁰⁷ Or should we allow mandatory relocation of such operations, either immediately or after some period of time to allow negotiations? If we were to authorize mandatory relocation, should the new licensees be responsible for finding or consolidating incumbent operations (while ensuring such operators can continue with substantially similar operations and are held harmless financially)? Or should the Commission designate some portion of the 12 GHz band or another spectrum band for such relocation? What parameters would we need to put down to ensure efficient use of new overlay licenses while protecting incumbents? Would a transition mechanism like the one used in 3.7-4.2 GHz, including accelerated relocation payments for incumbents to encourage them to voluntarily make the spectrum available for two-way mobile flexible use in an expeditious manner, be appropriate for some or all incumbents in this band?¹⁰⁸

39. *Third*, should new terrestrial operations come in the form of an underlay? Under this type of approach, any additional terrestrial operations likely would need to be authorized at low power and would need to operate on an opportunistic basis, not causing harmful interference to—nor seeking protection from harmful interference by—the incumbent primary services in the band. For example, if the technical analysis were to show only that low-power, two-way operations were feasible, would a low-power, unlicensed underlay make the most sense, as advocated by Public Knowledge?¹⁰⁹ Specifically,

¹⁰⁶ AT&T Aug. 6, 2020 *Ex Parte* at 2. See also T-Mobile Comments at 6.

¹⁰⁷ In the 900 MHz Report and Order, the Commission realigned the band and established a transition mechanism based primarily on negotiations between prospective broadband licensees and existing narrowband incumbent licensees. *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, Report and Order, Order of Proposed Modification, and Orders, WT Docket No. 17-200, FCC 20-67, (May 14, 2020).

¹⁰⁸ See 47 CFR §§ 27.1411-27.1424, *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343 (2020). See also AT&T Aug. 6, 2020 *Ex Parte* at 6.

¹⁰⁹ See Public Knowledge July 9, 2020 *Ex Parte* at 6 (stating the Commission should seek comment on the possibility of a low-power or very low power unlicensed underlay, and that “the propagation characteristics of 12
(continued....)

Public Knowledge argues that making 500 megahertz of spectrum available on an unlicensed or licensed-by-rule basis could allow for new Wi-Fi 6 uses which the Commission has previously supported in the 6 GHz proceeding.¹¹⁰ If the Commission adopts such an approach, could we rely on our traditional Part 15 rules for such an underlay? Alternatively, should we consider the auctioning of underlay licenses or licensing underlay use by rule? We note that any users of such an underlay would be required to fully protect all DBS, NGSO FSS, and MVDDS operations. Given this requirement, we seek comment on the costs and benefits of an underlay approach.

40. In deciding how to assign new terrestrial rights, we note that several commenters contend that MVDDS licensees have failed to provide meaningful commercial service in the band.¹¹¹ As a construction requirement, MVDDS licensees must make a showing of substantial service at the end of five years into the license period and ten years into the license period.¹¹² The Commission established a safe harbor for MVDDS of actual delivery of service to customers via four separate transmitting locations per million population in their license area.¹¹³ We are aware of only one current wide-area commercial MVDDS deployment, in Albuquerque, New Mexico.¹¹⁴ Apart from the showing for the Albuquerque license, other licensees report meeting the Commission's substantial service construction requirement for each license based on the safe harbor for MVDDS.¹¹⁵ Although MVDDS licensees point out that they met

(Continued from previous page)

GHz should permit robust indoor use without jeopardizing existing satellite or future mobile services"); *see also* Letter from Gregory Guice, Director of Government Affairs, Public Knowledge *et al* to Marlene H. Dortch, Secretary, FCC at 2 (filed Nov. 3, 2020) (stating the Commission can allow unlicensed sharing without compromising satellite service, and that a public proceeding will allow engineers to weigh in on the feasibility of shared usage).

¹¹⁰ *See* Letter from Michael Calabrese, Director, Wireless Future Program, New America's Open Technology Institute, to Marlene H. Dortch, Secretary, FCC at 2 (filed Jan. 6, 2021) (citing *In re Unlicensed Use of 6 GHz band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 GHz and 24 GHz*, ET Docket 18-295, GN Docket 17-183 (April 24, 2020)).

¹¹¹ AT&T Aug. 6, 2020 *Ex Parte* at 2; Commercial Spaceflight Federation Nov. 16, 2020 *Ex Parte*; CAGW Oct. 22, 2020 *Ex Parte* at 1-2, n.2 (stating that MVDDS licensees admit that because of the non-harmful interference requirements of their spectrum licenses, "they could never use them effectively") *citing* Jon Reid, "Dish, RS Access Wage Quiet Bid to Shift Airwaves Licenses for 5G," Bloomberg Law (Dec. 4, 2019), <https://news.bloomberglaw.com/tech-and-telecom-law/dish-rs-access-wage-quiet-bid-to-shift-airwaves-licenses-for-5g>.

¹¹² 47 CFR § 101.1413(b) ("The substantial service requirement is defined as a service that is sound, favorable, and substantially above a level of mediocre service which might minimally warrant renewal."). At the end of each period, "the Commission will consider factors such as: (1) whether the licensee's operations service niche markets or focus on serving populations outside of areas serviced by other MVDDS licensees; (2) whether the licensee's operations serve populations with limited access to telecommunications services; and (3) a demonstration of service to a significant portion of the population or land area of the licensed area." *Id.*

¹¹³ *See Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, Memorandum Opinion and Order and Second Report and Order, ET Docket No. 98-206, 17 FCC Rcd 9612, para. 177 (2002).

¹¹⁴ The MVDDS licensee in Albuquerque, New Mexico, reports that it has deployed a large-scale broadband Internet service offering that reaches more than 900,000 people (or approximately 50 percent of the population) in the Albuquerque geographic license area. *See* RS Access, LLC, ULS File No. 0008742312, Required Notification for Call Sign WQAR 561, Substantial Service Showing Supplement at 43-49. "To build a high-speed, high-power broadband network, RSA/MDS required a waiver from the FCC of certain MVDDS operating constraints – namely, the EIRP levels." *Id.* at 43 (note omitted). RS Access states that the waiver allows a single transmitter to replicate the service quality of multiple MVDDS transmitters operating elsewhere without a waiver. *Id.* at 43.

¹¹⁵ *See, e.g.*, DISH Network, L.L.C., ULS File No. 0008735865, Required Notification for Call Sign WQAR665.

the required construction benchmarks and claim that they have plans for future service,¹¹⁶ these licensees also contend that the current technical rules for MVDDS are prohibitively restrictive.¹¹⁷ Should we delay expanding flexible-use rights in the 12 GHz band until such time as the Bureau resolves any issues associated with MVDDS licensee's substantial showing filings, as suggested by SpaceX?¹¹⁸ While we expect that the Bureau will carefully examine the licensees' filings for compliance with the applicable rules, we also seek comment on the current status of MVDDS network construction. In what areas are MVDDS licensees currently providing services and in what areas do licensees anticipate offering services in the near term?

3. Approaches to Sharing

41. If coexistence among the co-primary services, i.e., DBS, NGSO FSS, MVDDS incumbents, and the proposed flexible-use service (i.e., two-way, mobile service) is technically feasible without resulting in harmful interference to any incumbent service, we next seek comment on the appropriate means to facilitate such shared use. We recognize that our technical analysis as well as public interest considerations will guide our approach to sharing, and we seek comment on whether particular approaches to sharing depend on certain results of our technical analysis (for example, is one approach more appropriate than another if we kept a maximum EIRP for terrestrial operations?).

42. *Service-Rule Sharing.* We first seek comment on whether the operating parameters proposed by the MVDDS 5G Coalition—specifically modifying the power levels available to terrestrial operations and modifying some of the coordination requirements—are sufficient to enable new terrestrial operations. What are the maximum power levels and the most flexibility that could be granted to new terrestrial operations with simple service-rule sharing while still protecting incumbents from harmful interference? Commenters should discuss the potential benefits and value of terrestrial operations under these conditions.

43. *Geographic Sharing.* Would geographic sharing protect and facilitate use of DBS and NGSO FSS in some areas without precluding new flexible-use deployment elsewhere? Would geographic sharing allow higher-power terrestrial operations in certain areas rather than others? How should such geographic sharing be structured? Do subscribers of satellite services typically receive these services in more rural areas? What are the propagation characteristics of this band with respect to mobile system coverage? What is the cell size? Like other, higher-frequency 5G bands, will cell size be limited to a few hundred meters based on line-of-site conditions? Can smaller sized cells provide the flexibility necessary to mitigate any potential interference with respect to DBS (or NGSO) satellite service operations either before or after deployment of the network? What are the potential costs and benefits of geographic sharing?

44. According to AT&T, the MVDDS 5G Coalition's proposal would result in "some fixed, low-power base stations in 'unique geographic conditions' away from the millions of DBS users sprinkled through virtually every community, perhaps in 'urban canyons' or other places where satellites might not reach."¹¹⁹ We seek comment on this view.

45. *Dynamic Sharing Between Full Power Terrestrial and Satellite.* Federated Wireless claims that "industry [has] confidence in the ability of dynamic spectrum sharing technologies to enable new and innovative uses in [] spectrum, while protecting incumbent operations."¹²⁰ Parties such as DISH,

¹¹⁶ See Go Long Wireless, et al. Aug. 14, 2020 *Ex Parte* at 1-2; RS Access Aug. 6, 2020 *Ex Parte* at 2.

¹¹⁷ MVDDS 5G Coalition Pet. for Rulemaking at 5-6; See RS Access Aug. 6, 2020 *Ex Parte* at 1.

¹¹⁸ SpaceX Jan. 6, 2021 *Ex Parte*, Attach. A at 2.

¹¹⁹ AT&T Aug. 6, 2020 *Ex Parte* at 5-6.

¹²⁰ Letter from Jennifer M. McCarthy, Vice President, Legal Advocacy, Federated Wireless, Inc., to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1 (filed Nov. 3, 2020) (Federated Wireless Nov. 3, 2020 *Ex Parte*).

DSA, Federated Wireless, Public Knowledge, RS Access, and WeLink argue that new dynamic spectrum sharing techniques, such as spectrum access systems (SASs) that were developed for the Citizens Broadband Radio Service and the automated frequency coordination (AFC) approach established for unlicensed access in the 6 GHz band, could facilitate increased terrestrial use of the 12 GHz band.¹²¹ How could dynamic sharing mechanisms facilitate continued use by DBS, NGSO FSS, and MVDDS incumbents, while also accommodating potential new uses such as two-way mobile service?¹²²

46. What improvements have there been in dynamic spectrum technology that might enable flexible use and sharing among these services? For example, are database-based coordination systems sophisticated enough to account for earth stations' receiving data from both thousands of NGSO satellites as well as DBS receivers, thus permitting mobile terrestrial use while preventing harmful interference to all incumbent users? How would such a system work? Is there any history of successful dynamic spectrum sharing involving widely deployed satellites and ubiquitous terrestrial services?

47. How long would it take to develop an automated frequency coordination mechanism for the services in this band? To what extent could we leverage existing technologies (either the SASs created for the 3.5 GHz band or the AFC being developed for the 6 GHz band) to perform these functions? Would an entirely new system need to be developed? To the extent we could repurpose an existing system, what benefits or trade-offs would there be between using an existing system versus creating an entirely new dynamic-use system specifically tailored to the 12 GHz band? Would such a spectrum sharing system be able to satisfy the spectrum access needs for all the current and potential future satellite and terrestrial operators? If so, would it be worth the cost and burden of such a system to the respective services?

48. If we choose a dynamic sharing approach, we would propose to follow the existing prioritization of services for protection, with DBS continuing to receive the highest protection, followed by NGSO FSS and MVDDS. How should we assign priority under this approach to new terrestrial operations? And should we assign priority between NGSO FSS and MVDDS uses? Should we continue to apply a "first-in-time" approach in the context of a more dynamic sharing environment?

49. We seek comment on how a dynamic sharing mechanism would incorporate legacy DBS consumer equipment? AT&T has expressed concern that DBS is unlike a fixed service because DBS receivers are deployed ubiquitously, with some installed on vehicles and thus effectively mobile, and because exact geographic coordinates are not known.¹²³ Could these conditions be remedied and could we seek information to obtain greater granularity of location, information on DBS end-user equipment, the height of such equipment at the installation location and any technical aspects relevant for coordination? How would a dynamic frequency sharing coordination mechanism determine the presence and potential for interference from terrestrial services to DBS? How would such a mechanism incorporate legacy NGSO FSS consumer terminals?¹²⁴ If current DBS or NGSO FSS end-user equipment or databases are not able to support some type of coordination mechanism, should we adopt a requirement to incorporate such equipment going forward? Should legacy equipment be grandfathered and allowed to

¹²¹ DISH Oct. 27, 2020 *Ex Parte* at 1-2; DSA Aug. 21, 2020 *Ex Parte* at 2; Federated Wireless June 15, 2020 *Ex Parte* at 2; Public Knowledge, *et al.*, Jul. 9, 2020 *Ex Parte* at 5; RS Access Aug. 6, 2020 *Ex Parte* at 5-6; RS Access Sept. 21, 2020 *Ex Parte* at 2; WeLink June 26, 2020 *Ex Parte* at 1.

¹²² See Public Knowledge July 9, 2020 *Ex Parte* at 5. See also DSA Aug. 21, 2020 *Ex Parte* at 2 (citing Federated Wireless June 15, 2020 *Ex Parte* at 1).

¹²³ AT&T Oct. 16, 2020 *Ex Parte* at 2. According to AT&T, DBS receivers are tied to subscriber addresses, not specific coordinates, and subscribers have the right to move their dish from one location to another on their property without no notification requirement. *Id.*

¹²⁴ We note that SpaceX claims to have already begun to manufacture consumer terminal equipment, and it has deployed these end user terminals in beta testing. SpaceX Oct. 15, 2020 *Ex Parte*, Attach., SpaceX Starlink Update, at 3.

operate until a specified end date? We note that to receive protection from new proposed MVDDS transmitters, NGSO FSS licensees must already maintain a database of fixed subscriber earth stations, in a format that can be readily shared with MVDDS licensees.¹²⁵ Would such a database similarly facilitate protection from new terrestrial mobile two-way services? How should we address any consumer privacy concerns, or protection of proprietary and confidential business information, that might arise from the use of one or more databases to facilitate shared use among competing services?¹²⁶

50. If we decide to give priority to new terrestrial flexible-use services, vis-à-vis NGSO FSS or MVDDS, should we consider an approach similar to that taken in the 3.5 GHz band, in which we auctioned Priority Access Licenses (PALs) to promote innovative use while protecting incumbents?¹²⁷ Federated Wireless argues that the auction of PALs in 3.5 GHz band could serve as a model for how to facilitate shared use in the 12 GHz band.¹²⁸ SpaceX, however, argues that there are important distinctions between the 3.5 GHz band and the 12 GHz band that make it infeasible to auction PALs in this band.¹²⁹ For example, SpaceX asserts that there are far fewer earth stations in the 3.5 GHz band than the 12 GHz band because FSS use in the former is limited to international inter-continental systems and is subject to case-by-case electromagnetic compatibility analysis.¹³⁰ In addition, according to SpaceX, blanket earth station licensing in 12 GHz means that there are many more receivers in the band that cannot be adequately tracked (including DBS receivers).¹³¹ We seek comment on these views.

51. More broadly, how would dynamic spectrum sharing affect existing services? Would it reduce the incentives of existing operators to invest in deployment? During the period in which a sharing technology was developed, would it prevent the band from being put to its most productive use? Or would it facilitate new investment and innovation in this band?

52. *Opportunistic Use of the Band.* Are there other approaches the Commission could adopt to enable operation of opportunistic use of the 12 GHz band? What technical and operational rules would be needed to ensure such systems do not cause harmful interference to incumbent systems? Considering the spectral needs of DBS, MVDDS, NGSO FSS, would there be usable spectrum in enough geographic areas to allow for more than *de minimis* opportunistic use? Would there be enough interest in such use to spur equipment manufacturing? Commenters that believe there is a potential approach should specifically address the potential value created through sharing and costs of the proposed solution.

53. DSA argues that the Commission could promote far more intensive use of the band by authorizing coordinated access to vacant 12 GHz spectrum on a secondary basis.¹³² It contends that such

¹²⁵ See, e.g., 47 CFR §§ 25.139(a) (requiring NGSO FSS licensees to maintain a subscriber database in a format that can be readily shared with MVDDS licensees for the purpose of determining compliance with the MVDDS transmitting antenna spacing requirement relating to qualifying existing NGSO FSS subscriber receivers set forth in § 101.129); 101.103(f)(1) (prior to the construction or addition of an MVDDS transmitting antenna, the MVDDS licensee shall provide notice of intent to construct the proposed antenna site to NGSO FSS licensees operating in the 12 GHz band and maintain an Internet web site of all existing transmitting sites and transmitting antennas that are scheduled for operation within one year, including the “in-service” dates); 101.129(b) (MVDDS licensees must not locate transmitting antennas within 10 km of any qualifying NGSO FSS receiver); 101.1440(b) (for each proposed transmitter, MVDDS licensees must conduct a survey to determine the location of all DBS customers of record that may potentially be affected by the introduction of its MVDDS service).

¹²⁶ SpaceX Jan. 6, 2021 *Ex Parte*, Attach. A at 2-3.

¹²⁷ See DSA Aug. 21, 2020 *Ex Parte* at 3.

¹²⁸ Federated Wireless Nov. 3, 2020 *Ex Parte*, at 1-2.

¹²⁹ SpaceX Nov. 6, 2020 *Ex Parte* at 2.

¹³⁰ *Id.*

¹³¹ *Id.*

¹³² DSA Aug. 21, 2020 *Ex Parte* at 2.

an approach would “provide spectrum-as-infrastructure to fixed wireless ISPs and other broadband network providers [that operate] in underserved” areas, including rural and tribal communities.¹³³ DSA argues that the Commission could adopt rules for opportunistic access to locally vacant spectrum in the 12 GHz band that operate in much the same way as the 3.5 GHz band rules authorize General Authorized Access (GAA) to unused PAL spectrum.¹³⁴ Should coordinated, shared use of the band for high-capacity fixed wireless services be authorized on an opportunistic, unlicensed, or licensed-by-rule basis?¹³⁵

54. Could the 12 GHz band support opportunistic use of unused spectrum on a localized basis, such as for high-capacity fixed wireless in rural and less densely populated areas?¹³⁶ What technical and operational rules would be needed for such usage to ensure that incumbent services are protected from harmful interference? Would the benefits of opportunistic use outweigh the costs, such as the complexity it would create and the coordination burden it would place on incumbents?

55. Could such operation be permitted based on sensing technology or a database (such as a SAS)? What provisions would be needed under either type of regime to prevent harmful interference to other services?

B. Maintaining the Current Framework

56. Next, we seek comment on whether the costs of accommodating new services in the band, including the potential for adverse impact or additional burden on existing services, exceed the benefits. Several commenters argue that the existing rules and services in the band allow for intense and efficient use of this spectrum, and that changes to the band are therefore unnecessary.¹³⁷ For example, SpaceX’s Starlink system has commenced testing of its service in multiple states, and SpaceX asserts it will begin commercial broadband service to rural users by the end of 2020.¹³⁸ SpaceX cites support from several organizations for its Starlink system, such as the Hoh Indian Tribe in Washington who has stated that “because of NGSO service, the tribe ‘finally has broadband, distributed to our community in only a matter of weeks’ and that the Commission should ‘maintain the careful and successful balance that allows the 12 GHz frequency band to provide this service.’”¹³⁹ SpaceX was a winning bidder in the Rural Digital Opportunity Fund Phase I auction, where it won \$888.5 million to deploy high-speed broadband to unserved homes and businesses over a ten-year period.¹⁴⁰ SpaceX claims that its service is capable of providing downlink/uplink speeds of 103/42 megabits-per-second and a consistently observed median latency of 30 milliseconds.¹⁴¹ According to SpaceX, making changes to the band potentially could

¹³³ *Id.* (quoting Public Knowledge July 9, 2020 *Ex Parte* at 3).

¹³⁴ DSA Aug. 21, 2020 *Ex Parte* at 3.

¹³⁵ *See Id.* at 2.

¹³⁶ *See* Letter from Alexi Maltas, Senior Vice President & General Counsel, Competitive Carriers Association, et al., to Marlene H. Dortch, Secretary, FCC, Docket No. RM-11768, at 1-2 (filed Oct. 30, 2020).

¹³⁷ 12 GHz Operators Oct. 20, 2020 *Ex Parte* at 1; SpaceX Nov. 5, 2020 *Ex Parte* at 2; Letter from Allen Pratt, Executive Director National Rural Education Association, to Marlene H. Dortch, Secretary, FCC, FCC, Docket No. RM-11768, at 1 (filed Nov. 17, 2020); Letter from Chris Eyhorn, Founder and Chief Executive Officer, DroneSense, to Marlene H. Dortch, Secretary, FCC, FCC, Docket No. RM-11768, at 1 (filed Nov. 17, 2020); Letter from Steve Pociask, President/CEO, American Consumer Institute, et al., to Ajit Pai, Chairman, FCC, et al., at 1-2 (filed Nov. 17, 2020); USTelecom Oct. 21, 2020 *Ex Parte* at 1-2; National Taxpayers’ Union Oct. 20, 2020 *Ex Parte* at 3.

¹³⁸ SpaceX July 31 *Ex Parte* at Appx. 2.

¹³⁹ SpaceX Jan. 6, 2021 *Ex Parte*, Attach. A at 2.

¹⁴⁰ *See Rural Digital Opportunity Fund Phase I Auction (Auction 904) Closes; Winning Bidders Announced*, Public Notice, DA 20-1422, (Dec. 7, 2020).

¹⁴¹ SpaceX Oct. 15, 2020 *Ex Parte*, Attach., SpaceX Starlink Update at 3.

threaten its planned operations while doing little to close the digital divide.¹⁴² How might this uncertainty affect future investment in new systems, whether in 12 GHz or in other frequency bands?¹⁴³ What actions can we take in this proceeding to ensure that the locations successfully bid for through the RDOF process get access to the broadband Internet access service committed to through that program? SpaceX further claims that NGSO systems have the potential to provide low latency 5G backhaul using 12 GHz band spectrum.¹⁴⁴ Could maintaining the current framework allow NGSO-provided backhaul to proliferate? Alternatively, would allowing terrestrial mobile service in the band harm NGSOs' ability to provide backhaul? If terrestrial mobile and satellite-based backhaul services cannot both be provided in the band, then which service would best serve the public interest?

57. AT&T has repeatedly argued that adopting the proposals of the MVDDS 5G Coalition would not adequately protect DBS operations in the 12 GHz band, which potentially could result in "an untenable interference environment" for the tens of millions of DBS subscribers receiving programming via the 12 GHz Band.¹⁴⁵ DISH, which is the other DBS provider in the band, disagrees and contends that MVDDS 5G Coalition's two technical studies have demonstrated that geographic separation, transmitter power constraints on MVDDS operations, and other siting parameters, as well as absorption due to clutter, can ensure that interference from terrestrial base stations to DBS users would rarely, if ever, occur.¹⁴⁶ If the Commission maintains the current framework, then NGSO FSS and Fixed Service would continue to operate on a co-primary, non-harmful interference basis to DBS.¹⁴⁷ In that case, neither DBS nor NGSO FSS would be subjected to the uncertainty of new rules adopted for the band. Are the potential benefits of further action to facilitate flexible use for terrestrial services in the 12 GHz band outweighed by the potential uncertainty and the costs caused by granting terrestrial, flexible-use rights in this band?¹⁴⁸ Should the Commission conclude that the appropriate balance between satellite and terrestrial use has already been struck by the framework currently in place, such that few or no revisions to the service rules are required?

58. As noted above, the Commission has made a substantial amount of spectrum available for 5G services in the period since the 5G MVDDS Coalition filed its Petition. In particular, since that time, the Commission completed the post-auction transition of the 600 MHz band, making 70 megahertz of low-band spectrum available for 5G.¹⁴⁹ The Commission completed three auctions of millimeter-wave spectrum, putting nearly five gigahertz of high-band spectrum into the market.¹⁵⁰ At least one nationwide

¹⁴² Letter from David Goldman, Director of Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, FCC, Docket No. RM-11768, at 3 (filed June 4, 2020).

¹⁴³ See SpaceX Nov. 5, 2020 *Ex Parte* at 2.

¹⁴⁴ SpaceX Jan. 6, 2021 *Ex Parte* Attach. A. at 2.

¹⁴⁵ 12 GHz Operators Oct. 20, 2020 *Ex Parte* at 2 & n.2 (citing AT&T Aug. 6, 2020 *Ex Parte* at 1).

¹⁴⁶ DISH Sept. 22, 2020 *Ex Parte* at 3.

¹⁴⁷ Under the approach that the Commission adopted for NGSO FSS and MVDDS sharing, first in-time NGSO FSS receivers and first in-time MVDDS transmitting systems are afforded more and easier use of the shared 12 GHz band than subsequent deployments. The Commission concluded that such a result is equitable and consistent with the co-primary status of NGSO FSS and MVDDS. See *MVDDS Second Report & Order*, 17 FCC Rcd at 9659, para. 111; see also *OneWeb Order*, 32 FCC Rcd at 5370 para. 8.

¹⁴⁸ See SpaceX Nov. 5, 2020 *Ex Parte* at 3; CAGW Oct. 22, 2020 *Ex Parte* at 2-3 (citing Amy Thompson, "SpaceX just launched 60 new Starlink internet satellites and nailed rocket landing at sea," Space.com, Oct. 18, 2020, <https://www.space.com/spacex-starlink-satellites-launch-rocket-landing-oct-18-2020>.)

¹⁴⁹ Press Release, FCC, Post-Incentive Auction Transition Successfully Meets 39-Month Deadline (July 13, 2020), <https://www.fcc.gov/document/post-incentive-auction-transition-successfully-meets-39-month-deadline>.

¹⁵⁰ See *Incentive Auction of Upper Microwave Flexible Use Service Licenses in the Upper 37 GHz, 39 GHz, and 47 GHz Bands for Next-Generation Wireless Services Closes; Winning Bidders Announced for Auction 103*, Public Notice, 35 FCC Rcd 2015 (2020); *Winning Bidders Announced for Auction of 28 GHz Upper Microwave Flexible* (continued....)

service provider has characterized this spectrum as instrumental to its 5G deployment plans.¹⁵¹ As for mid-band spectrum, the Commission has repurposed 480 megahertz between 3550 and 3980 MHz and is on track to potentially repurpose an additional adjacent 100 megahertz in the 3.45 GHz band.¹⁵² Have intervening developments over the past four years, including the Commission’s work to make additional spectrum resources available for 5G and the number of NGSO systems that have been authorized to operate using 12 GHz band spectrum, counsel against making changes to the current framework for the 12 GHz band? The Commission values the public interest benefits that could flow from NGSOs offering an affordable solution for delivering high-speed Internet services to communities that might be more expensive to serve through other technologies. How should the potential public interest benefits of those services be balanced by the Commission as it proceeds with this rulemaking?

59. The Commission noted in the *OneWeb Order* that NGSO FSS operators have access to other frequency bands, “such that even if NGSO FSS systems were precluded entirely from the 12.2-12.7 GHz band,” OneWeb would still retain a measure of flexibility to provide its proposed services.¹⁵³ Given the proliferation of NGSO authorizations and ongoing deployments, we seek comment on whether this remains the case, as well as the costs and benefits of maintaining the current framework. Additionally, the Commission adopted similar, though not identical, conditions in the various NGSO authorizations for use of the 12 GHz band. We seek comment on the various conditions included in the NGSO authorizations and what effect (if any) these variations should have on our analysis.

60. If we maintain the current framework, should we make any revisions to the MVDDS technical rules within the existing regulatory framework so as to facilitate more robust terrestrial operations without causing harmful interference to satellite operations in the band?¹⁵⁴ We note that the Commission contemplated that MVDDS service providers might petition for waivers of the technical rules and that, in denying a petition for reconsideration to increase the power limit for all MVDDS licenses, it was not prejudging whether a rationale for higher EIRP and EPFD limits in rural areas might have some technical merit in certain very specific circumstances.¹⁵⁵ The Commission also stated that after it gained experience with MVDDS operations, it would entertain requests to modify the general EPFD and EIRP limits, if such experience provided sufficient justification for such action.¹⁵⁶ We invite comment on whether there are any other changes we could adopt in revising our existing rules that would improve the efficiency of incumbent use of the band.

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Use Service Licenses (Auction 101), Public Notice, 34 FCC Rcd 4279 (2019); *Auction of 24 GHz Upper Microwave Flexible Use Service Licenses Closes; Winning Bidders Announced for Auction 102*, Public Notice, 34 FCC Rcd 4296 (2019).

¹⁵¹ Howard Bushkirk, *AT&T, Verizon Executives Say They Have Spectrum They Need for 5G*, Comm Daily (Jan. 7, 2021) (quoting Ronan Dunne, Verizon Consumer Group CEO, as stating that “[t]he ‘crème de la crème’ of [Verizon’s] portfolio is its extensive 28 and 39 GHz holdings . . .”).

¹⁵² *Auction of Priority Access Licenses in the 3550-3650 MHz Band Closes; Winning Bidders Announced for Auction 105*, Public Notice, 35 FCC Rcd 9287 (2020); *Expanding Flexible Use in the 3.7-4.2 GHz Band*, Report and Order, Order Proposing Modification, 35 FCC Rcd 2343 (2020), *Facilitating Shared Use in the 3100-3550 MHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 11078 (2020).

¹⁵³ *OneWeb Order*, 32 FCC Rcd at 5369 para. 6.

¹⁵⁴ See, e.g., *Wireless Telecommunications Bureau Seeks Comment on Petitions of Seven Licensees for Waiver of Multichannel Video Distribution and Data Service Technical Rules*, WT Docket No. 15-218, Public Notice, 30 FCC Rcd 9953 (WTB BD 2015) (petitioners seek waivers of 47 CFR §§ 101.113 note 11, 101.147(p), 101.1407, and 101.1411(a), to use the 12 GHz band for two-way, point-to-point operation at an EIRP up to 55 dBm).

¹⁵⁵ *MVDDS Second Report & Order*, 17 FCC Rcd at 9704 para. 236; *Fourth Memorandum Opinion and Order*, 18 FCC Rcd 8428, 8469 paras. 87-88 (2003).

¹⁵⁶ *Fourth Memorandum Opinion and Order*, 18 FCC Rcd at 8469 para. 88.

IV. PROCEDURAL MATTERS

61. *Ex Parte Rules – Permit-But-Disclose.* Pursuant to Section 1.1200(a) of the Commission’s rules,¹⁵⁷ this *NPRM* shall be treated as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.¹⁵⁸ 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.

62. *Comment Period and 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: <https://www.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 docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.
- Filings can be sent 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.
 - 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
 - Postal Service first-class, Express, and Priority mail must be addressed to 45 L Street, NE, Washington DC 20554
- Effective March 19, 2020, and until further notice, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19.
- During the time the Commission’s building is closed to the general public and until further notice, if more than one docket or rulemaking number appears in the caption of a proceeding, paper filers need not submit two additional copies for each additional docket or rulemaking number; an original and one copy are sufficient.

¹⁵⁷ 47 CFR § 1.1200(a).

¹⁵⁸ 47 CFR §§ 1.1200 *et seq.*

63. *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).

64. *Regulatory Flexibility Act*. The Regulatory Flexibility Act of 1980, as amended (RFA),¹⁵⁹ requires that a regulatory flexibility analysis be prepared for notice and comment rulemaking proceedings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”¹⁶⁰ Accordingly, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning potential rule and policy changes contained in this *Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix A.

65. *Initial Paperwork Reduction Act Analysis*. This Notice of Proposed Rulemaking may contain potential new or revised information collection requirements. Therefore, we seek comment on potential new or revised information collections subject to the Paperwork Reduction Act of 1995.¹⁶¹ If the Commission adopts any new or revised information collection requirements, the Commission will publish a notice in the Federal Register inviting the general public and the Office of Management and Budget to comment on the information collection requirements, 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.

66. *Further Information*. For further information, contact Madelaine Maior of the Wireless Telecommunications Bureau, Broadband Division, at 202-418-1466 or Madelaine.Maior@fcc.gov; or Simon Banyai of the Wireless Telecommunications Bureau, Broadband Division, at 202-418-1443 or Simon.Banyai@fcc.gov.

V. ORDERING CLAUSES

67. IT IS ORDERED, pursuant to the authority found in Sections 1, 2, 3, 4, 5, 7, 301, 302, 303, 304, 307, 309, 310, and 316 of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 153, 154, 155, 157, 301, 302, 303, 304, 307, 309, 310, and 316, and Sections 1.407 and 1.411 of the Commission’s Rules, 47 CFR §§ 1.407, 1.411, the petition for rulemaking filed by the MVDDS 5G Coalition, RM-11768, IS GRANTED to the extent discussed herein and otherwise TERMINATED, and this *Notice of Proposed Rulemaking* in the captioned docket(s) IS ADOPTED.

68. 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

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

¹⁶⁰ *Id.* § 605(b).

¹⁶¹ Public Law 104-13.

APPENDIX

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 public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments as specified in the *Notice of Proposed Rulemaking*. 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. In the *Notice*, the Commission explores various proposals seeking to change rules to permit terrestrial, flexible use, including two-way mobile service in the 12.2–12.7 GHz band (the band or the 12 GHz band). The potential rule changes seek to facilitate the provision of terrestrial flexible use while protecting incumbent operations in the bands. This *Notice* pursues the Commission’s joint goals of putting spectrum to its highest-value and most efficient use, while balancing desired speed to the market, efficiency of use, and effectively accommodating incumbent operations in the band. The potential approaches explored for future use of the 12 GHz band are enhancing shared use of the band or maintaining the current framework.

3. In the United States, the 12 GHz band is allocated on a primary basis for non-Federal use for Broadcasting Satellite Service (BSS) (referred to domestically in the band as Direct Broadcast Satellite (DBS); Fixed Satellite Service (space-to-Earth) limited to non-geostationary orbit systems (NGSO FSS); and Fixed Service.⁴ While these three services are co-primary, NGSO FSS and Fixed

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 5 U.S.C. § 603(a).

³ See *id.*

⁴ See 47 CFR § 2.106, United States Table of Frequency Allocations, non-Federal Table for the band 12.2-12.7 GHz. NGSO FSS (space-to-Earth) operations are authorized pursuant to international footnote 5.487A, which provides additional allocations including in Region 2 as follows:

[The 12.2-12.7 GHz is] allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of [ITU Radio Regulations] No. 9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the [ITU Radiocommunication] Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and [international footnote] No. 5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the [12 GHz band] shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

47 CFR § 2.106, footnote 5.487A. When an international footnote is applicable without modification to non-Federal operations, the Commission places the footnote on the non-Federal Table. See 47 CFR § 2.105(d)(5).

Service are allocated on a non-harmful interference basis with respect to BSS.⁵ Currently there are three services authorized and operating in the band: DBS providers operating under the primary BSS allocation, Multi-Channel Video and Data Distribution Service (MVDDS) licensees operating on a non-harmful interference basis to DBS under the co-primary Fixed Service allocation, and NGSO licensees operating on a non-harmful interference basis to DBS under the co-primary NGSO FSS allocation. This proceeding is predicated in part on the MVDDS 5G Coalition petition for rulemaking,⁶ however alternative uses for the band were raised by various commenters. Incumbent NGSO and some DBS interests seek to continue to use the band without ceding rights to MVDDS licensees. To facilitate further consideration of the various proposals in the *Notice* the Commission seeks comments on how to weigh public interest considerations associated with allowing, prohibiting and prioritizing uses and on the costs and benefits of allowing new uses of the 12 GHz bands for terrestrial, flexible use, including two-way mobile.

4. Our rules currently enable sharing between co-primary NGSO FSS and MVDDS using a combination of technical limitations, information sharing, and first-in-time procedures.⁷ Pursuant to the Commission's joint goals of putting spectrum to its highest-value and most efficient use, while balancing desired speed to the market, efficiency of use, and effectively accommodating incumbent operations in the band, we identify and seek comment on two potential approaches to future use of the 12 GHz band: enhancing opportunities for shared use of the band, or retaining the current rules for the band. As a threshold matter, we seek comment on how to weigh the spectrum the Commission has already made available for 5G over the past four years and the hundreds of satellites that have been launched by the NGSO FSS operators in considering whether it is technically feasible to add additional or expanded spectrum rights in the 12 GHz band without causing harmful interference to incumbent licensees (and, if so, whether a balancing of public interest benefits would support taking that step). The Commission also seeks comment on whether coexistence between and among existing and proposed services is technically achievable and, if so, what mechanisms the Commission might consider in facilitating such coexistence. The Commission also seeks comment on whether to maintain the current rules for the band.

5. By modifying our rules and implementing policies designed to provide for more flexible use of new technologies in the 12 GHz band, the Commission hopes to ensure that this spectrum is efficiently utilized and will foster the development of new and innovative technologies and services, as well as encourage the growth and development of a wide variety of services, ultimately leading to greater benefits to consumers.

B. Legal Basis

6. The proposed action is authorized pursuant Sections 1, 2, 3, 4, 5, 7, 301, 302, 303, 304, 307, 309, 310, and 316 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 153, 154, 155, 157, 301, 302, 303, 304, 307, 309, 310, and 316, and Sections 1.407 and 1.411 of the Commission's Rules, 47 CFR §§ 1.407, 1.411.

⁵ See 47 CFR § 2.106, n.5.490 (International Footnote). In Region 2, in the band 12.2-12.7 GHz, existing and future terrestrial radiocommunication services shall not cause harmful interference to the space services operating in conformity with the broadcasting satellite Plan for Region 2 contained in Appendix 30.

⁶ MVDDS 5G Coalition Petition. See also *Petition for Rulemakings Filed*, Public Notice, Report No. 3042 (May 9, 2016) (Petition Public Notice). In its most recent filing, the Coalition's members were reported to be: Cass Cable TV, Inc., DISH Network L.L.C., Go Long Wireless LTD., MDS Operations, Inc., MVD Number 53 Partners, Satellite Receivers, Ltd., SOUTH.COM LLC, Story Communications, LLC, and Vision Broadband, LLC. See MVDDS 5G Coalition May 28, 2019 Ex Parte at 1. We note that MDS Operations subsequently assigned its remaining 60 MVDDS licenses to RS Access.

⁷ See 47 CFR §§ 101.113(a) n.11; 101.147(p).

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

7. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.⁸ The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”⁹ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.¹⁰ 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.¹¹

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.¹² 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.¹³ These types of small businesses represent 99.9% of all businesses in the United States which translates to 30.7 million businesses.¹⁴

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.”¹⁵ The Internal Revenue Service (IRS) uses a revenue benchmark of \$50,000 or less to delineate its annual electronic filing requirements for small exempt organizations.¹⁶ Nationwide, for tax year 2018, there were approximately 571,709 small exempt organizations in the U.S. reporting revenues of \$50,000 or less according to the registration and tax data for exempt organizations available from the IRS.¹⁷

⁸ 5 U.S.C. § 603(b)(3).

⁹ 5 U.S.C. § 601(6).

¹⁰ 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.”

¹¹ 15 U.S.C. § 632.

¹² See 5 U.S.C. § 601(3)-(6).

¹³ See SBA, Office of Advocacy, “What’s New With Small Business,” <https://cdn.advocacy.sba.gov/wp-content/uploads/2019/09/23172859/Whats-New-With-Small-Business-2019.pdf> (Sept. 2019).

¹⁴ *Id.*

¹⁵ 5 U.S.C. § 601(4).

¹⁶ The IRS benchmark is similar to the population of less than 50,000 benchmark in 5 U.S.C § 601(5) that is used to define a small governmental jurisdiction. Therefore, the IRS benchmark has been used to estimate the number small organizations in this small entity description. See Annual Electronic Filing Requirement for Small Exempt Organizations — Form 990-N (e-Postcard), “Who must file,” <https://www.irs.gov/charities-non-profits/annual-electronic-filing-requirement-for-small-exempt-organizations-form-990-n-e-postcard>. We note that the IRS data does not provide information on whether a small exempt organization is independently owned and operated or dominant in its field.

¹⁷ See Exempt Organizations Business Master File Extract (EO BMF), “CSV Files by Region,” <https://www.irs.gov/charities-non-profits/exempt-organizations-business-master-file-extract-ao-bmf>. The IRS Exempt Organization Business Master File (EO BMF) Extract provides information on all registered tax-exempt/non-profit organizations. The data utilized for purposes of this description was extracted from the IRS EO BMF data for Region 1-Northeast Area (76,886), Region 2-Mid-Atlantic and Great Lakes Areas (221,121), and
(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.”¹⁸ U.S. Census Bureau data from the 2017 Census of Governments¹⁹ indicate that there were 90,075 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.²⁰ Of this number there were 36,931 general purpose governments (county²¹, municipal and town or township²²) with populations of less than 50,000 and 12,040 special purpose governments - independent school districts²³ with enrollment populations of less than 50,000.²⁴ Accordingly, based on the 2017 U.S. Census of Governments data, we estimate that at least 48,971 entities fall into the category of “small governmental jurisdictions.”²⁵

11. *Wired Telecommunications Carriers.* The U.S. Census Bureau defines this industry as “establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services; wired (cable) audio and video programming distribution; and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities

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Region 3-Gulf Coast and Pacific Coast Areas (273,702) which includes the continental U.S., Alaska, and Hawaii. This data does not include information for Puerto Rico.

¹⁸ 5 U.S.C. § 601(5).

¹⁹ 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 *See also* Census of Governments, <https://www.census.gov/programs-surveys/cog/about.html>.

²⁰ See U.S. Census Bureau, 2017 Census of Governments – Organization, Table 2. Local Governments by Type and State: 2017 [CG1700ORG02]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. Local governmental jurisdictions are made up of general purpose governments (county, municipal and town or township) and special purpose governments (special districts and independent school districts). See also Table 2. CG1700ORG02 Table Notes_Local Governments by Type and State_2017.

²¹ See *–id* at Table 5, County Governments by Population-Size Group and State: 2017 [CG1700ORG05]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 2,105 county governments with populations less than 50,000. This category does not include subcounty (municipal and township) governments.

²² See *–id* at Table 6, Subcounty General-Purpose Governments by Population-Size Group and State: 2017 [CG1700ORG06]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 18,729 municipal and 16,097 town and township governments with populations less than 50,000.

²³ See *id* at Table 10, Elementary and Secondary School Systems by Enrollment-Size Group and State: 2017 [CG1700ORG10]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 12,040 independent school districts with enrollment populations less than 50,000. See also Table 4. Special-Purpose Local Governments by State Census Years 1942 to 2017 [CG1700ORG04], CG1700ORG04 Table Notes_Special Purpose Local Governments by State_Census Years 1942 to 2017.

²⁴ While the special purpose governments category also includes local special district governments, the 2017 Census of Governments data does not provide data aggregated based on population size for the special purpose governments category. Therefore, only data from independent school districts is included in the special purpose governments category.

²⁵ This total is derived from the sum of the number of general purpose governments (county, municipal and town or township) with populations of less than 50,000 (36,931) and the number of special purpose governments - independent school districts with enrollment populations of less than 50,000 (12,040), from the 2017 Census of Governments - Organizations Tables 5, 6, and 10.

and infrastructure that they operate are included in this industry.²⁶ The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.²⁷ For this industry, U.S. Census Bureau data for 2012 show that there were 3,117 firms that operated for the entire year.²⁸ Of this total, 3,083 firms had fewer than 1,000 employees.²⁹ Thus, under this size standard, the majority of firms in this industry can be considered small.

12. *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.³⁰ The appropriate size standard under SBA rules is that such a business is small if it has 1,500 or fewer employees.³¹ For this industry, U.S. Census Bureau data for 2012 show that there were 967 firms that operated for the entire year.³² Of this total, 955 firms had employment of 999 or fewer employees and 12 firms had employment of 1,000 employees or more.³³ Thus under this category and the associated size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities.

13. *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.”³⁴ Satellite telecommunications service providers include satellite and earth station operators. The category has a small business size standard of \$35 million or less in average annual receipts, under SBA rules.³⁵ For this category, U.S. Census Bureau data for 2012 show that there were a total of 275 firms that operated for the entire year.³⁶ Of this total, 299 firms had annual

²⁶ See U.S. Census Bureau, *2017 NAICS Definition*, “517311 Wired Telecommunications Carriers”, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517311&search=2017>.

²⁷ See 13 CFR § 121.201, NAICS Code 517311 (previously 517110).

²⁸ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1251SSSZ5, *Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012*, NAICS Code 517110, <https://data.census.gov/cedsci/table?text=EC1251SSSZ5&n=517110&tid=ECNSIZE2012.EC1251SSSZ5&hidePreview=false>.

²⁹ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

³⁰ See U.S. Census Bureau, *2017 NAICS Definition*, “517312 Wireless Telecommunications Carriers (except Satellite)”, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517312&search=2017+NAICS+Search&search=2017>.

³¹ See 13 CFR § 121.201, NAICS Code 517312 (previously 517210).

³² See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1251SSSZ5, *Information: Subject Series: Estab and Firm Size: Employment Size of Firms for the U.S.: 2012*, NAICS Code 517210, <https://data.census.gov/cedsci/table?text=EC1251SSSZ5&n=517210&tid=ECNSIZE2012.EC1251SSSZ5&hidePreview=false&vintage=2012>.

³³ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

³⁴ See U.S. Census Bureau, *2017 NAICS Definition*, “517410 Satellite Telecommunications”, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517410&search=2017+NAICS+Search&search=2017>.

³⁵ See 13 CFR § 121.201, NAICS Code 517410.

³⁶ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1251SSSZ4, *Information: Subject Series: Estab and Firm Size: Receipts Size of Firms for the U.S.: 2012*, NAICS Code 517410,

(continued....)

receipts of less than \$25 million.³⁷ Consequently, we estimate that the majority of satellite telecommunications providers are small entities.

14. *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.³⁸ 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.³⁹ Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry.⁴⁰ The SBA has developed a small business size standard for “All Other Telecommunications,” which consists of all such firms with annual receipts of \$35 million or less.⁴¹ For this category, U.S. Census Bureau data for 2012 show that there were a total of 1,442 firms that operated for the entire year.⁴² Of these firms, a total of 1,400 firms had annual receipts of less than \$25 million and 15 firms had gross annual receipts of \$25 million to \$49,999,999.⁴³ Thus, the Commission estimates that a majority of “All Other Telecommunications” firms potentially affected by our actions can be considered small.

15. *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.⁴⁴ 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.⁴⁵ The SBA has established a small business size standard for this industry of 1,250 employees or less.⁴⁶ U.S. Census Bureau data for 2012 show that 841 firms operated in this industry in that year.⁴⁷ Of that number, 828 establishments operated with fewer than 1,000 employees, 7

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<https://data.census.gov/cedsci/table?text=EC1251SSSZ4&n=517410&tid=ECNSIZE2012.EC1251SSSZ4&hidePrevious=false&vintage=2012>.

³⁷ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

³⁸ See U.S. Census Bureau, *2017 NAICS Definition*, “517919 All Other Telecommunications,” <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?input=517919&search=2017+NAICS+Search&search=2017>.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ See 13 CFR § 121.201, NAICS Code 517919.

⁴² See U.S. Census Bureau, *2017 Economic Census of the United States*, Table ID: EC1251SSSZ4, *Information: Subject Series - Estab and Firm Size: Receipts Size of Firms for the United States: 2012*, NAICS Code 517919 <https://data.census.gov/cedsci/table?text=EC1251SSSZ4&n=517919&tid=ECNSIZE2012.EC1251SSSZ4&hidePrevious=false>.

⁴³ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

⁴⁴ See U.S. Census Bureau, *2017 NAICS Definition*, “334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing”, <https://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=334220&search=2017>.

⁴⁵ *Id.*

⁴⁶ See 13 CFR § 121.201, NAICS Code 334220.

⁴⁷ See U.S. Census Bureau, *2012 Economic Census of the United States*, Table ID: EC1231SG2, *Manufacturing: Summary Series: General Summary: Industry Statistics for Subsectors and Industries by Employment Size: 2012* (continued....)

establishments operated with between 1,000 and 2,499 employees and 6 establishments operated with 2,500 or more employees.⁴⁸ Based on this data, we conclude that a majority of manufacturers in this industry is small.

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

16. We expect the various proposals seeking to change rules to permit terrestrial, flexible use, including two-way mobile service in the 12.2–12.7 GHz band considered in the *Notice* may impose new or additional reporting or recordkeeping and/or other compliance obligations on small entities as well as on other licensees and applicants if adopted. In particular, potential rule changes involving licensing, registration, and coordination could increase recordkeeping and reporting obligations for small entities and for other licensees and applicants. There may also be new compliance obligations created by required equipment upgrades. The Commission believes at this time that applying any of the potential rule changes equally to all entities would promote fairness.

17. In the *Notice*, the Commission is considering adopting rules with the goal of promoting shared access to the 12 GHz band. The MVDDS 5G Coalition’s proposal to license two-way, mobile operations in the band and its proposed elimination of the effective isotropic radiated power (EIRP) limit could impact compliance obligations associated with protecting incumbent operators from harmful interference. If flexible use is authorized in the band, the Commission has requested comment on whether the burden of avoiding or correcting for interference to existing or future DBS subscribers should be revised? Or should two-way and/or mobile licensees be subject to the same requirements for protecting DBS subscribers that currently apply to other services in the band? Another proposed approach for comment aimed at protecting incumbents raised in the *Notice* is whether new terrestrial operations should be restricted to indoor use as the Commission has done in several other bands to allow for the shared use of spectrum between unlicensed devices and licensed services.

18. The Commission's assigning of new terrestrial service rights could also result in new or modified compliance obligations. Three potential approaches for assigning new terrestrial service rights are raised in the *Notice* for comment. *First*, should the Commission modify existing licenses using our section 316 authority to conform to new service rules designed to allow increased operational flexibility.

19. *Second*, should we auction overlay licenses for the band? If the overlay license approach is chosen, should we authorize only voluntary relocation of incumbents, either for a limited period or in perpetuity? Or should we allow mandatory relocation of such operations, either immediately or after some period of time to allow negotiations? If the Commission were to authorize mandatory relocation, should the new licensees be responsible for finding or consolidating incumbent operations (while ensuring such operators can continue with substantially similar operations and are held harmless financially)? Or should the Commission designate some portion of the 12 GHz band or another spectrum band for such relocation? What parameters would we need to put down to ensure efficient use of new overlay licenses while protecting incumbents? Would a transition mechanism like the one used in 3.7-4.2 GHz, including accelerated relocation payments for incumbents to encourage them to voluntarily make the spectrum available for two-way mobile flexible use in an expeditious manner, be appropriate for some or all incumbents in this band?⁴⁹ *Third*, should new terrestrial operations come in the form of an underlay

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NAICS Code 334220,
<https://data.census.gov/cedsci/table?text=EC1231SG2&n=334220&tid=ECNSIZE2012.EC1231SG2&hidePreview=false>.

⁴⁸ *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

⁴⁹ See 47 CFR §§ 27.1411-27.1424, *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343 (2020). See also AT&T Aug. 6, 2020 Ex Parte at 6.

and can the Commission rely on our traditional Part 15 rules for such an underlay, or should we consider the auctioning of underlay licenses or licensing underlay use by rule?

20. Potential approaches to facilitate sharing in the 12 GHz band upon which the Commission seeks comment in the *Notice*—Service-Rule Sharing, Geographic Sharing and Dynamic Sharing Between Full Power Terrestrial and Satellite—could also impact compliance obligations if adopted. For example, MVDDS 5G Coalition proposed operating parameters modifying the power levels available to terrestrial operations and modifying some of the coordination requirements to enable new terrestrial operations. In addition, the Commission has inquired whether there are any other approaches it could adopt to enable operation of opportunistic use of the 12 GHz band and the technical and operational rules necessary to ensure such systems do not cause harmful interference to incumbent systems. Further, in the event the Commission decides to maintain the current framework, we inquire whether revisions should be made to the MVDDS technical rules within the existing regulatory framework that would facilitate more robust terrestrial operations without causing harmful interference to satellite operations in the band which could have compliance obligation implications.

21. Also under consideration in the *Notice*, is whether to require certain licensees to provide more granular spectrum-usage information to the Commission or to third parties, whether to auction Priority Access Licenses (PALs) to promote innovative use through dynamic sharing technologies to protect incumbents. Any auction would necessarily impose certain filing requirements on applicants, including short- and long-form applications. While these obligations if adopted require information to be filed with the Commission and may increase the paperwork burden on affected entities, we do not believe that the costs and/or administrative burdens associated with these rules would unduly burden small entities or other licensees.

22. Finally, at this time, the Commission is not currently in a position to determine whether, if adopted, the proposed rules and associated requirements raised in the *Notice* would require small entities to hire attorneys, engineers, consultants, or other professionals and cannot quantify the cost of compliance with the potential rule changes and compliance obligations raised herein. In our discussion of these proposals in the *Notice*, we have sought comments from the parties in the proceeding, and requested cost and benefit analyses, which may help the Commission identify and evaluate relevant matters for small entities, including any compliance costs and burdens that may result in the proceeding.

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

23. The RFA requires an agency to describe any significant, specifically small business, alternatives for small businesses 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 such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities.”⁵⁰ To assist with the Commission’s evaluation of the economic impact on small entities, the Commission has requested that commenters provide costs and benefits analyses for sharing proposals and any other solutions raised in comments. Having data on the costs and economic impact of proposals and approaches will allow the Commission to better evaluate options and alternatives for minimization should there be a significant economic impact on small entities as a result of the proposals in this *Notice*. A significant alternative the Commission raised for consideration and seeks comment upon in the *Notice*, is whether the costs of accommodating new services in the 12 GHz band, such as terrestrial two-way mobile use, exceed the benefits thus warranting maintaining the current framework.

⁵⁰ 5 U.S.C. § 603(c)(1)-(4).

24. The Commission expects to more fully consider the economic impact and alternatives for small entities following the review of comments and costs and benefits analyses filed in response to the *Notice*. The Commission's evaluation of this information will shape the final alternatives it considers, the final conclusions it reaches, and any final 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

25. None.

**STATEMENT OF
CHAIRMAN AJIT PAI**

Re: *Expanding Flexible Use of the 12.2-12.7 GHz Band*, WT Docket No. 20-443; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7-24 GHz*, GN Docket No. 17-183; *MVDDS 5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service*, RM-11768 (Proceeding Terminated)

Today, we launch a proceeding to determine whether the Commission should permit the introduction of new services in the 500 megahertz of spectrum between 12.2 and 12.7 GHz while protecting incumbent licensees from harmful interference. We do so mindful of the substantial amount of progress this Commission has made over the past four years to bring additional spectrum to market and to authorize new and innovative satellite-based services.

In April 2016, a coalition of Multichannel Video Distribution and Data Service (or MVDDS) licensees petitioned the Commission to adopt rule changes to allow for mobile two-way service in the 12 GHz band. In the 57 months since that time, the FCC has held four spectrum auctions (with a fifth auction currently ongoing), making more spectrum available for 5G service than was previously licensed to all mobile wireless operators *combined*, and raising billions of dollars for the federal government in the process. When the MVDDS 5G Coalition filed its petition, the 12 GHz band was unused by non-geostationary orbit constellations. Today, we have authorized 11 such constellations, several of which are planning to use the 12 GHz band. And Direct Broadcast Satellite service continues to provide video programming to millions of homes across America through 12 GHz spectrum.

In this Notice of Proposed Rulemaking, we take stock of the current uses of the 12 GHz band and seek comment on whether technological innovations would allow for the deployment of terrestrial mobile service in the band, including 5G. The central focus of our inquiry is whether the Commission can increase opportunities for shared use of the band while protecting incumbents from harmful interference. We also seek comment on approaches for potentially assigning new terrestrial use rights, including the possibility of authorizing underlay use of the band on an unlicensed or opportunistic basis, as well as on mechanisms for sharing the band. And we ask whether the public interest benefits of maintaining the current allocations in the band outweigh any potential changes to our rules.

Interested stakeholders will surely provide valuable input on the questions asked in this Notice. Technical studies will undoubtedly be submitted from all sides. And this agency's expert staff will—as it has done so many times before—scrutinize the arguments and data in the record and be guided by the evidence and sound engineering. So while I will not be at the helm of the Commission as this work comes to fruition, I am proud to kick-start the process so that others are well-positioned to move forward and bring regulatory certainty to this band after so many years.

I extend my thanks to the Commission staff who helped prepare this Notice of Proposed Rulemaking. From the Wireless Telecommunications Bureau: Simon Banyai, Peter Daronco, Tim Hilfiger, Ethan Lucarelli, Madelaine Maior, Anthony Patrone, Matthew Pearl, Blaise Scinto, Dana Shaffer, and Don Stockdale; from the International Bureau: Jennifer Gilsenan, Nese Guendelsberger, Karl Kensinger, Kathryn Medley, Kerry Murray, Stephanie Neville, Sankar Persaud, Tom Sullivan, Merissa Velez, and Jay Whaley; from the Office of Engineering and Technology: Bahman Badipour, Jamie Coleman, Michael Ha, Ira Keltz, Nicholas Oros, and Ron Repasi; from the Office of Economics and Analytics: Patrick Brogan, Jonathan Campbell, Patrick DeGraba, Evan Kwerel, Paul Lafontaine, Eliot Maenner, Giulia McHenry, Erik Salovaara, Martha Stancill, Emily Talaga, and Margy Wiener; from the Office of General Counsel: Deborah Broderson, David Horowitz, Linda Oliver, and Bill Richardson; and from the Office of Communications Business Opportunities: Chana Wilkerson.

**STATEMENT OF
COMMISSIONER BRENDAN CARR**

Re: *Expanding Flexible Use of the 12.2-12.7 GHz Band*, WT Docket No. 20-443; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7-24 GHz*, GN Docket No. 17-183; *MVDDS 5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service*, RM-11768 (Proceeding Terminated)

A range of different providers offer services in the 12 GHz band today. And with this proceeding, we seek comment on whether adding additional authorizations would promote or hinder the delivery of next-generation services. As we do so, I want to thank my colleagues for agreeing to edits that added additional questions to this Notice and thus helped ensure that we approach the policy and technical issues associated with this band in a balanced manner. I look forward to reviewing the record in this proceeding and reaching a result that will promote the public interest.

**STATEMENT OF
COMMISSIONER GEOFFREY STARKS
CONCURRING**

Re: *Expanding Flexible Use of the 12.2-12.7 GHz Band*, WT Docket No. 20-443; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7-24 GHz*, GN Docket No. 17-183; *MVDDS 5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service*, RM-11768 (Proceeding Terminated)

The Petition underlying this proceeding was filed with the Commission in April 2016. In that filing, the Petitioners clearly stated that mobile wireless operations could not coexist in the 12 GHz band with NGSO satellite broadband, a service that was still largely on the drawing board at that time. For over four years, this Administration ignored that Petition even as it granted multiple authorizations to NGSO applicants. Many of those decisions noted the potential of next-generation satellite broadband, particularly for service to the hardest-to-reach communities. During that same period, this Commission repeatedly expanded the number of spectrum bands available for terrestrial wireless service, even as the Petitioners failed to roll out any significant service of their own.

NGSO operators like SpaceX and OneWeb have now launched over a thousand satellites and invested billions of dollars relying on access to the 12 GHz band to provide service to their customers. SpaceX recently even won nearly \$900 million in universal service funding in our RDOF auction -- a huge priority for this Administration. From the beginning, these NGSOs have told us that repurposing the 12 GHz band would not only damage their ability to serve and compete for customers but also raise questions about their future investments in a service that could help close the rural digital divide.

This NPRM would have been more appropriate years ago as opposed to these final closeout days. While the parties dispute whether NGSO operators assumed the risk that we might someday repurpose the band, the failure of the outgoing Administration to act until the final month of its tenure raises serious questions about the timing of this item, when the impact of any changes to the band will be far more disruptive.

Advocates describe this item as a “neutral” NPRM that simply asks what, if anything, to do with the 12 GHz band, without proposing any specific course of action. Those same advocates claim that there’s no harm in simply asking questions about the future of the band, but that claim is belied by the insistence of those same parties on the designation of this item as a Notice of Proposed Rulemaking rather than a Notice of Inquiry. That insistence demonstrates that those parties intend this item to open the door to taking away a primary downlink for satellite broadband service that has already seen billions of dollars in investment. Merely adopting this NPRM raises serious questions about the future use of the band, and may cause NGSOs to reconsider their investment decisions -- even as our agency likewise invests hundreds of millions of dollars in satellite broadband to connect rural America.

Nevertheless, I recognize that some services in the band are in decline or have not fulfilled their promise. Maximizing the efficient use of spectrum is a core function of this agency, and I concur with moving forward. As we do so, however, I expect the Commission to weigh the heavy concern of protecting satellite broadband from harmful interference from any new operations while also ensuring that this valuable service can fulfill its full potential. Moreover, given the current state of the existing terrestrial licensees’ operations, I look forward to examining how those parties are fulfilling their own FCC obligations and whether they should benefit from any changes to the band going forward.

**STATEMENT OF
COMMISSIONER NATHAN SIMINGTON**

Re: *Expanding Flexible Use of the 12.2-12.7 GHz Band*, WT Docket No. 20-443; *Expanding Flexible Use in Mid-Band Spectrum Between 3.7-24 GHz*, GN Docket No. 17-183; *MVDDS 5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service*, RM-11768 (Proceeding Terminated)

The compromise reached on the 12 GHz Notice of Proposed Rulemaking strikes a delicate and important balance that protects the significant and ongoing investment by incumbents operating in the band. Notably, since the MVDDS 5G Coalition filed its petition in 2016, NGSO FSS providers have invested heavily in deploying broadband service, particularly in unserved and underserved rural areas. Rapid deployment between the petition filing and today is remarkable. The Commission, as a matter of policy, does not prejudge matters and is committed to allow all stakeholders to show how their proposed uses of spectrum serve the public interest.

The Notice of Proposed Rulemaking allows the Commission to investigate whether it is technically possible to allow for two-way terrestrial service to operate in the band, as requested by the MVDDS providers. It also creates an opportunity for the Commission to investigate whether additional protections could and should be afforded to NGSO FSS providers. As such, it is consistent with the Commission's goals and purposes of technology agnosticism in the public interest and the establishment of a clear evidentiary basis for all actions.

Commission policies must always further protect and encourage providers who have and continue to expeditiously deploy service in the band. NGSO FSS deployment occurred even though NGSO FSS providers have had to operate on a non-interference basis with respect to other incumbents. Through this Notice of Proposed Rulemaking, the Commission looks forward to protecting the public interest by clarifying the record to ensure that 12 GHz spectrum is put to its highest and best use.