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

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
	)	
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95 and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112

COMMENTS OF VIASAT, INC.
TO THIRD FURTHER NOTICE OF PROPOSED RULEMAKING

Viasat, Inc. ("Viasat") submits these comments in response to the Commission's Third Further Notice of Proposed Rulemaking ("FNPRM") in the Spectrum Frontiers proceeding to support the Commission's proposal to designate the 50.4-51.4 GHz band segment for satellite operations.[1]

Viasat is a leading provider of communications solutions to U.S. businesses, consumers, and government users across a wide range of technologies, including satellite. Viasat has made significant advances in the provision of satellite broadband services, most notably revolutionary satellite technologies that make it possible to provide high-speed broadband connections that are comparable to what consumers have come to expect for terrestrial broadband services. Viasat has already developed mobile applications of this satellite technology that provide Wi-Fi

[1] *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, GN Docket No. 14-177, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, FCC 18-73, ¶ 94 (rel. June 8, 2018) ("FNPRM").

connectivity on airplanes that supports video streaming, and it is developing other technology that will be able to provide the same Wi-Fi connectivity to motor vehicles, trains, and ships.[2]

In the FNPRM, the Commission acknowledges the importance of making spectrum available on a shared basis and proposes to allow licensing of FSS earth stations in the 50.4-51.4 GHz band based on the same framework for sharing with co-primary UMFU services that currently governs the licensing of individual FSS earth stations 47.2-48.2 GHz band segment.[3] Section 25.136(d) allows licensing of individual FSS earth stations in the 47.2-48.2 GHz band segment on a protected basis provided that there are no more than two other protected earth stations in the same county and no more than 14 other protected earth stations within the same PEA, and subject to certain additional siting restrictions.[4]

Viasat has a strong interest in the adoption of rules to allow satellite use of the 50.4-51.4 GHz band segment within the U.S. in accordance with the co-primary FSS allocation that currently exists, and thus, Viasat supports the Commission's proposal to make additional spectrum available for satellite use under the Commission's service designations for the V band. As Viasat has emphasized throughout this proceeding, the satellite industry is looking to spectrum in the V band, including the 50.4-51.4 GHz segment that is the subject of the FNPRM, as a critical input for the continued growth trajectory in the satellite industry, as the Ka band is quickly reaching capacity. Viasat's next-generation satellite networks are being designed to incorporate V band spectrum, including the 50.4-51.4 GHz, along with Ka band spectrum. Specifically, Viasat has proposed to serve the United States using a state-of-the-art NGSO

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[2] *See* Ajit Pai, FCC Blog, "Saying Goodbye to Summer Vacation" (Sept. 4, 2018), *available at* https://www.fcc.gov/news-events/blog/2018/09/04/saying-goodbye-summer-vacation.

[3] FNPRM at ¶ 94.

[4] *See* 47 C.F.R. § 25.136(d).

system that operates in both the V and Ka bands. The VIASAT-NGSO satellite network would serve businesses, consumers and government users using the 50.4-51.4 GHz band segment, among other spectrum, consistent with the existing FSS allocation in that band, both in the U.S. and internationally.[5]

Current broadband capacity on Viasat's networks in the Ka band is used predominantly to provide broadband service to customers in their homes. Access to additional spectrum is needed to satisfy growing consumer demand for broadband services, as well as the higher speeds and throughput necessary to accommodate high-bandwidth applications, such as video streaming, by multiple devices. The capabilities of satellite technology to provide cost-efficient broadband services to rural households at speeds and prices that are comparable to those of terrestrial alternatives is highlighted by the prominent role of satellite in the recent CAF Phase II auction.[6] In addition, mobile earth stations (ESIMS) operate within the same networks to provide in-flight Wi-Fi connectivity, which consumers and airlines increasingly demand.

Viasat is seeking to expand Ka band access on its current networks to satisfy these increases in demand in the near-term, but its next-generation satellite networks will need additional spectrum to meet projected growth in broadband demand in the longer term. Spectrum in the V band, including the 50.4-51.4 GHz segment, is a key part of the solution. As Viasat has previously explained in this proceeding, high-capacity satellite technologies require larger bands of contiguous spectrum for a greater degree of spectrum efficiency and increased

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[5] *See* Viasat, Inc., IBFS File No. SAT-PDR-20161115-00120, Call Sign S2985 (filed Nov. 15, 2016).

[6] *See* FCC News Release, "Connect America Fund Auction to Expand Broadband to Over 700,000 Rural Homes and Businesses" at 7 (rel. Aug. 28, 2018) (listing winning bidders in CAF Phase II auction, including Viasat, in over 190,000 locations in 20 states).

bandwidth and capacity in order to meet consumer needs.[7] The amount of spectrum available for satellite is a key factor in reducing the "cost per bit" of delivering satellite broadband services, which enables the cost-effective and affordable satellite services being offered today.

Throughout this proceeding, the Commission has acknowledged the ability of satellite earth stations to operate on a shared basis with the 5G services contemplated in the bands at issue. Viasat urges the Commission to recognize the ability for smaller gateway-type earth stations to operate on a non-interference basis with respect to 5G, as it did in the context of the 27.5-28.35 GHz.[8] There, the Commission explicitly allowed earth stations to be authorized without the need for a protection zone on a secondary basis, and outside the per county/population limits that otherwise exist. Secondary earth station operations are similarly feasible in the 47.2-48.2 GHz and 50.4-51.4 GHz transmit bands and thus should expressly be allowed.

Indeed, during the course of this proceeding, Viasat submitted technical analyses demonstrating that a significant degree of sharing with anticipated 5G services was feasible, and urged that allowing satellite access in spectrum shared with UMFU would ensure more intensive use of scarce spectrum resources, thereby facilitating the advancement of broadband availability through a wide range of technologies.[9] Viasat's development of gateway earth station

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[7] *See, e.g.*, Comments of Viasat, Inc. to Further Notice of Proposed Rulemaking, GN Docket No. 14-177, *et al.*, at 5-6 (filed Sept. 30, 2016).

[8] *See Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 ¶ 58 & n.129 (2016).

[9] *See* Viasat, Inc., *Ex Parte* Submission, GN Docket No. 14-177, *et al.*, at Attachment "Fixed-Satellite Service Earth Station Receiver and 5G Coexistence" (filed Oct. 2, 2017); Viasat, Inc., *Ex Parte* Submission, GN Docket No. 14-177, *et al.*, at Attachment "Fixed-Satellite Service Earth Station Receiver and 5G Coexistence (including Ground Mount Antennas)" (filed Oct. 18, 2017).

technology that significantly reduces the size (and therefore the cost) of deploying aggregation and interconnection facilities for its satellite networks, enables the deployment of many thousands of these earth stations across the U.S. to increase the capacity of the satellite network. And because these smaller gateway earth stations have extremely small or non-existent RF footprints, they are able to operate in very close proximity (and even right next to) terrestrial networks in the same frequency band.

Based in part on these analyses, the Commission reconsidered its original three-per-PEA limitation on protected earth stations in the 37.5-40 GHz band segment, and increased the limit to three per county and 15 per PEA.[10] Further, the Commission applied this increased limit when it allowed satellite access to the 47.2-48.2 GHz band segment.[11] While this framework imposes limits on satellite deployment, it reflects a compromise that facilitates expansion of satellite services and opens up much-needed spectrum resources for next-generation satellite networks. Therefore, Viasat supports the Commission's proposal to allow satellite use of the 50.4-51.4 GHz band segment pursuant to the same sharing framework applicable to the 47.2-48.2 GHz band segment. Further, Viasat urges the Commission to clarify that, given the sharing capabilities of smaller earth stations such as Viasat's, these types of earth stations may be authorized to operate on a secondary basis with respect to terrestrial wireless, as an alternative to the criteria for protection enumerated in Section 25.136.

Furthermore, Viasat urges the Commission to add an allocation for satellite at 51.4-52.4 GHz in a later stage in this proceeding. In the FNPRM, the Commission deferred addressing that

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[10] *See Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988 ¶¶ 136-137 (2017).

[11] *See id.* at ¶ 54.

band segment for now, either for FSS or terrestrial fixed or mobile wireless.[12] For the same reasons that allowing satellite use of the 50.4-51.4 GHz band segment would increase capacity on future satellite networks, the Commission should consider ways to make full and efficient use of the 51.4-52.4 GHz band segment by allowing shared access for satellite and terrestrial operations. Sharing with terrestrial services in that band segment is possible on the same terms that the Commission is proposing for the adjacent 50.4-51.4 GHz band segment pursuant to this FNPRM.

For the reasons discussed above, Viasat supports the Commission's proposal to allow access for satellites to the 50.4-51.4 GHz band segment. Viasat urges the Commission to recognize the ability of small earth stations to operate on a secondary basis in the 47.2-48.2 GHz and 50.4-51.4 GHz band segments, as an alternative to meeting the criteria for protection in Section 25.136.

Respectfully submitted,

/s/

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[12] *See* FNPRM at ¶ 94 nn.289 &290.