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

REPLY COMMENTS OF SPACE EXPLORATION TECHNOLOGIES CORP.

Space Exploration Technologies Corp. ("SpaceX") hereby replies to the comments submitted in response to the Third Further Notice of Proposed Rulemaking ("Third FNPRM") in the above-captioned proceeding.[1] The record in this proceeding underscores the opportunity before the Federal Communications Commission ("Commission") to authorize a balanced sharing regime between satellite and terrestrial uses in the 50.4-51.4 GHz band rather than imposing its proposed restrictive rules on the deployment of individually licensed satellite earth stations. Because of the unique characteristics of this band and the next-generation earth station technology now under development, the Commission can avoid having to choose one technology over another through an overly burdensome regulatory regime in which the government forces a technologically unnecessary limitation on the number of earth stations in a given county or

[1] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, 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*, GN Docket No. 14-177, WT Docket No. 10-112, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, FCC 18-73 (2018) (the Third Further Notice of Proposed Rulemaking, the "Third FNPRM").

Partial Economic Area. Instead, the Commission can allow both technologies to flourish by permitting the power flux density contour of earth stations in a given county to cover: (1) 0.1% of the population of a county with more than 600,000 residents, (2) 600 residents in a county with between 6,000 and 600,000 residents, and (3) 10% of the population in a county with fewer than 6,000 residents (these sharing criteria, "Co-Equal Access"). Doing so will facilitate the development and deployment of all next-generation services in the band and maximize benefits to consumers throughout the U.S., including those in rural, remote, and unserved locations unlikely to be reached by terrestrial service.

I. THE RECORD IS CLEAR THAT THE COMMISSION SHOULD PROVIDE CO-EQUAL ACCESS TO THE 50.4-51.4 GHZ BAND TO PROMOTE THE DEVELOPMENT AND DEPLOYMENT OF INNOVATIVE, NEXT-GENERATION SERVICES.

A. Most Comments and the Facts Support Co-Equal Access

The Commission does not often have an opportunity to allow multiple technologies to serve consumers using the same spectrum band. In the case of the 50.4-51.4 GHz band, most commenters agreed with SpaceX that the physical characteristics of band, as well as the capabilities of next-generation gateway earth stations, present the perfect opportunity to create an innovation band that achieves the Commission's stated goal to offer "broader and more balanced sharing between the services on a true co-primary basis."[2] As SES and O3b (together, "SES") explain,

> The diminished propagation distances in the 50 GHz band have a two-fold effect on spectrum sharing between FSS and terrestrial operators. First, they shrink the size of earth station PFD contours, greatly minimizing the potential for individually-licensed earth stations to limit terrestrial deployment. Second, they

[2] *Id.* at ¶ 93.

> make it even more difficult for terrestrial operators to deploy countywide networks in low-density or sparsely populated areas of the country.[3]

Boeing additionally notes that "The propagation capabilities of transmissions in the 50 GHz range are very limited, meaning incidental side lobe emissions in the areas around satellite earth stations will dissipate quickly, particularly in the presence of natural or artificial shielding such as foliage. Thus, any exclusion zone created by a satellite earth station will be very small."[4] SpaceX agrees that, in light of the propagation characteristics of the high-frequency 50.4-51.4 GHz band, "[s]pectrum sharing between UMFUS licensees and individually licensed earth stations will not be difficult in the 50 GHz band."[5]

Moreover, as SpaceX explained in its initial comments, next-generation satellite earth stations will further enable more robust, geographically proximate sharing between satellite and terrestrial users by virtue of their operational characteristics. As Boeing points out, similar to terrestrial millimeter-wave base stations, satellite earth stations will transmit narrow, directed beams, and "will always transmit upward toward satellites."[6] Viasat similarly explains that because advanced 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."[7] This is in addition to the fact that, as satellite operators have shown, and the Commission has acknowledged, gateway earth stations can be sited in urban, suburban,

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[3] Comments of SES Americom, Inc. and O3b Limited on Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 10-112, at 3 (filed Sep. 10, 2018) ("SES Comments").

[4] Comments of the Boeing Company, GN Docket No. 14-177, WT Docket No. 10-112, at 5 (filed Sep. 10, 2018).

[5] *Id.*

[6] *Id.*

[7] Comments of Viasat, Inc. to Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 10-112, at 5 (filed Sep. 10, 2018).

and exurban locations without causing harmful interference to terrestrial operations through the use of physical shielding and thoughtful placement.[8]

As these commenters have demonstrated, the unique characteristics of the band and operational profile of both terrestrial and satellite uses of the 50.4-51.4 GHz spectrum present an opportunity to enable truly Co-Equal Access to facilitate the development and deployment of innovative services and allow the market to decide the highest and best use of the band.

B. The Record Does Not Support Importing Restrictive Earth Siting Restrictions

While the majority of commenters agree that an artificial limitation on earth stations in unnecessary, to the extent comments do support importing the restrictions from the 24 GHz band they provide little, if any, evidence to show how such a policy would better promote the public interest.[9] For instance, AT&T alleges that most commenters are seeking to "re-cut established regulations" and that no evidence has been provided to demonstrate that the balance struck between satellite and terrestrial uses of other millimeter wave bands should not be applied at 50.4-51.4 GHz.[10] As an initial matter, SpaceX is not asking to undo the balance struck at 24, 28, 39, and 47 GHz bands.

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[8] *See, e.g.*, Letter from John P. Janka, Counsel to ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177 *et al.* (filed July 7, 2016); Letter from John P. Janka, Counsel to ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177 *et al.* (filed Apr. 12, 2017); . *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, GN Docket No. 14-177 *et al.*, Report and Order and Further Notice of Proposed Rulemaking, FCC 16-89, at ¶ 46 (2016).

[9] Indeed, certain support of the Commission's proposal is entirely focused on commenters' narrow self-interest. For example, EchoStar's support is based solely on the fact that it can deploy a single satellite under development under the Commission's proposed earth station siting restrictions, and thus provides no insight into the merits of the proposal vis-à-vis broader sharing between satellite and terrestrial users of the 50.4-51.4 GHz band. *See* Comments of EchoStar Satellite Operating Corporation and Hughes Network Systems, LLC, GN Docket No. 14-177, WT Docket No. 10-112 (filed Sep. 10, 2018).

[10] Comments of AT&T Services, Inc., GN Docket No. 14-177, WT Docket No. 10-112, at 15-16 (filed Sep. 10, 2018).

Rather, SpaceX and most commenters are simply asking the Commission to recognize the distinct physical, technical, and economic characteristics of the 50.4-51.4 GHz band and allow consumers to take advantage of a more equal sharing regime between different developing next-generation technologies. As noted above, SpaceX and other commenters provided ample evidence illustrating that the physical properties of the band allow the Commission to offer Co-Equal Access between satellite and terrestrial users of the band to support the development of all next-generation communications services.

Further, the terrestrial wireless industry has not actually identified, or used, the 50.4-51.4 GHz band for core terrestrial 5G deployment, which differentiates it from the other millimeter wave bands to which the Commission has previously applied earth station siting limitations. CTIA, Nokia, T-Mobile, and the Competitive Carriers Association do not dispute this point. They instead contend that the Commission should reserve the band indefinitely for potential future terrestrial use, while consumers wait for eventual terrestrial service rules, just so the Commission can avoid "prejudic[ing] future mobile use of the spectrum."[11] But this position presents a false choice. The Commission need not—and, indeed, as a matter of sound policy, should not—forestall use of the 50.4-51.4 GHz spectrum by one advanced technology in favor of another's potential eventual use. Instead, by leveraging the physical characteristics of the band and the operational profile of next-generation earth stations, the Commission can enable robust sharing between satellite and terrestrial users of the band through Co-Equal Access. By doing so, the Commission can maximize the consumer benefits from the 50.4-51.4 GHz band as soon

[11] Comments of Competitive Carriers Association, GN Docket No. 14-177, WT Docket No. 10-112, at 7 (filed Sep. 10, 2018); *see also* Comments of CTIA, GN Docket No. 14-177, WT Docket No. 10-112, at 14 (filed Sep. 10, 2018); Comments of Nokia, GN Docket No. 14-177, WT Docket No. 10-112, at 4 (filed Sep. 10, 2018); Comments of T-Mobile USA, Inc., GN Docket No. 14-177, WT Docket No. 10-112, at 20 (filed Sep. 10, 2018).

as possible by making it a true innovation band, allowing all next-generation, advanced services in the band to develop.

II. CONCLUSION

For the foregoing reasons, the Commission should not adopt its proposed limitations on the deployment of FSS earth stations in the 50.4-51.4 GHz band, and instead should promote the development and deployment of next-generation satellite and terrestrial wireless services by providing such services access to this spectrum on a co-equal basis as a true innovation band.

Respectfully submitted,

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