Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Petition of The Boeing Company for	)	RM-11773
Allocation and Authorization of Additional	)	
Spectrum for the Fixed-Satellite Service in the	)	
50.4-51.4 GHz and 51.4-52.4 GHz Bands	)	

COMMENTS OF
THE SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association[1] provides these comments in support of the petition by The Boeing Company ("Boeing") to authorize additional uplink (Earth-to-space) spectrum for the Fixed-Satellite Service ("FSS") in the bands 50.4-51.4 GHz and 51.4-52.4 GHz on a co-primary basis.[2] As the Petition explains, the new uplink spectrum will help create a five gigahertz frequency block that is critical to enabling very high data-rate V-band satellite broadband service, and will do so without disrupting potential use of the spectrum by terrestrial 5G operations and airborne platforms.

Satellite broadband plays a key role in meeting the nation's ever-growing demand for broadband service, and very-high data rate service from V-band satellites offers the opportunity to definitively close the "broadband gap" in the quality and availability of service in areas of the United States that are unserved or underserved by terrestrial broadband. In order to fulfill this

[1] These comments are supported by all SIA members except for DIRECTV, which abstains from participation.

[2] Petition of The Boeing Company for Allocation and Authorization of Additional Spectrum for the Fixed-Satellite Service in the 50.4-51.4 GHz and 51.4-52.4 GHz Bands, RM-11773, Public Notice Report No. 3051 (Sept. 16, 2016) ("*Petition*").

role, satellite operators require sufficient spectrum to support the high speeds and network capacity necessary to deliver a technologically transparent broadband service to all Americans. Fully supporting the spectrum needs of satellite broadband does not require choosing between terrestrial use and satellite use. Through the use of reasonable and equitable sharing strategies, earth stations that are used for high-speed satellite broadband can coexist alongside terrestrial fixed, including those on airborne platforms, and 5G mobile services, maximizing the utility of the spectrum and the services available to consumers.

Finally, given the importance of these bands to the FSS community's V-band deployment strategy, and the importance of FSS to the national broadband deployment strategy, SIA agrees with recommendations to consider Boeing's Petition as part of the Commission's larger Spectrum Frontiers proceeding addressing the millimeter wave ("mmW") bands above 24 GHz.[3]

I. SATELLITE BROADBAND CAN HELP MEET EXPLODING DEMAND AND CLOSE THE BROADBAND GAP

America's demand for broadband capacity has grown nearly exponentially, and shows every sign that it will continue to do so. As SIA observed in the Spectrum Frontiers proceeding, much of the Commission's policy in recent years has been driven by the basic acknowledgement that the market demand for broadband data capacity is effectively insatiable.[4] Countless existing and emerging technologies, services, and businesses rely on the uninterrupted and fast flow of

[3] *See C*omments of Inmarsat, Inc., GN Docket No. 14-177, *et al*., at 19 (Sept. 30, 2016); Comments of ViaSat, Inc., GN Docket No. 14-177, *et al*., at 14 (Sept. 30, 2016); Comments of Qualcomm Incorporated, GN Docket No. 14-177, *et al*., at 11 (Sept. 30, 2016) ("*Qualcomm Comments*").

[4] Comments of the Satellite Industry Association, GN Docket No. 14-177, *et al.*, at 5 (Sept. 30, 2016) ("*SIA Further Notice Comments*").

data, and future innovation will surely require even greater capacity. A key challenge for the Commission is crafting policies that will lay the regulatory groundwork to meet this need.

Current projected Internet demand growth for North America is more than 200 percent between 2016 and 2020.[5] Between the growth of streaming video, video chat, Internet-connected TVs, the coming machine-to-machine communications of the Internet of Things, and other services not yet invented, demand on the nation's broadband networks may even accelerate beyond this already steep growth curve. Indeed, the Commission has acknowledged that it may be planning for a world with a 1,000-fold increase in traffic demand and services requiring 10 gigabits per second.[6]

It is already true that broadband is a "critical prerequisite"[7] for full participation in the economic and cultural life of the nation, and broadband access is a "powerful motor for lifting people from poverty and reducing economic inequalities."[8] It is therefore essential that the Commission ensure that its broadband policies account not only for the pressing need for increased capacity, but also the distribution of this capacity to all Americans, including those that are unserved or underserved by terrestrial wired and wireless service. This "broadband gap" has remained a stubborn fact of the United States telecommunications landscape, despite the

[5] Cisco Visual Networking Index Forecast and Methodology, 2015–2020, Table 8 (available at http://www.cisco.com/c/dam/en/us/solutions/collateral/service-provider/visual-networkingindex-vni/complete-white-paper-c11-481360.pdf).

[6] Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, GN Docket No. 14-177, *et al.*, *Report and Order and Further Notice of Proposed Rulemaking*, FCC 16-89, ¶ 9 (Jul. 14, 2016) ("*Spectrum Frontiers Further Notice*").

[7] Federal Communications Commission, Omnibus Broadband Initiative, Connecting America: The National Broadband Plan (2010), at 338 (available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296935A1.pdf).

[8] Remarks of Chairman Tom Wheeler, 19th Annual Satellite Leadership Dinner (March 7, 2016) (available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-338135A1.pdf).

Commission's substantial efforts to close it.[9] The most recent data from 2014 shows that 96 percent of urban households have access to broadband service, whereas only 58 percent of rural households have the same level of service.[10] This gap is a predictable effect of the practical reality of terrestrial broadband infrastructure deployment: It arrives earliest, cheapest, and in the highest quality to the urban cores where populations are dense and the business case is strong. Even as the industry and the Commission looks toward a new 25/3 Mbps broadband benchmark, widespread fiber to the home, and future 5G coverage, these advances will continue to come first to urban areas and only later, if ever, to less dense suburban, rural, remote, and tribal areas, likely at lower speeds, higher prices, and with fewer options.

High-speed broadband service delivered via FSS provides one opportunity to definitively reverse this trend. Satellite service, by its nature, provides broadband equally to all locations. By offering high speed service in excess of the Commission's broadband benchmark, and making this service available to any American, regardless of where they live, satellite service is a key complement and competitor to terrestrial service. The proposal to make available FSS uplink spectrum in the 50.4-51.4 GHz and 51.4-52.4 GHz bands on a co-primary basis is an important step in unlocking the potential of very high data-rate V-band satellite broadband systems to address the pressing national need to bring more broadband capacity to more people than ever before.

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[9] Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act, GN Docket No. 16-245, *Twelfth Broadband Progress Notice of Inquiry*, FCC 16-100, ¶ 2 (Aug. 4, 2016) (finding that broadband deployment is "not occurring broadly enough or quickly enough").

[10] International Comparison Requirements Pursuant to the Broadband Data Improvement Act International Broadband Data Report, GN Docket No. 15-191, *Fifth Report*, DA 16-97, ¶ 19 (Jan. 28, 2016).

II. SATELLITE BROADBAND REQUIRES ACCESS TO 5 GHZ OF PAIRED SPECTRUM IN THE V-BAND

The additional spectrum that is requested in Boeing's petition is necessary to the satellite industry's long term ability to serve the constantly growing demand of the U.S. broadband marketplace by providing very high speed service using the high data capacity of the V-band. To ensure that satellite operators can design their systems to fulfill the needs of the future, a commitment is required by the Commission to make available a full five gigahertz of paired V-band spectrum to support these next generation networks.

A total of five gigahertz of V-band FSS downlink (space-to-Earth) spectrum already exists in the International Table of Frequency Allocations, consisting of the 37.5-42.5 GHz band. Although a small portion of this spectrum (42.0-42.5 GHz) lacks an FSS allocation in the domestic Table of Frequency Allocations, the satellite industry continues to advocate for a downlink allocation in this spectrum as part of the Commission's Spectrum Frontiers proceeding[11] in order to make more intensive use of this underused spectrum while maintaining adequate protection for radio astronomy in the adjacent 42.5-43.5 GHz band.[12]

To pair with this five gigahertz of downlink spectrum, there are currently four gigahertz of allocated FSS uplink spectrum (47.2-50.2 GHz and 50.4-51.4 GHz, Earth-to-space) in the United States. The Petition proposes making a total of five gigahertz of uplink spectrum available in the United States by adding the 50.4-51.4 GHz band to Section 25.202 of the Commission's rules, and by allocating the 51.4-52.4 GHz band for FSS uplink operations on a co-primary basis under the U.S. Table of Frequency Allocations in Section 2.106 of the rules and

[11] *See, e.g., SIA Further Notice Comments* at 12; Comments of The Boeing Company, GN Docket No. 14-177, *et al.*, at 42-43 (Sept. 30, 2016).

[12] *See* Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band, *et al.*, IB Docket No. 97-95, FCC 10-186, ¶¶ 12-19 (2010).

also adding it to Section 25.202 of the Commission's rules. This will create a full five gigahertz of uplink spectrum for V-band FSS operations, essential to the provision of very high data rate broadband satellite services to all Americans.

As the Petition notes, such an allocation would be consistent with Resolution 162, adopted at WRC-15, which initiated studies of the 51.4-52.4 GHz band for FSS use.[13] Resolution 162 acknowledges the potential of broadband satellites using spot-beam technologies and frequency reuse to deliver high speed service of greater than 45 Mbps in a spectrally efficient manner. Therefore, a decision by the Commission to create an FSS allocation in the 51.4-52.4 GHz band would further demonstrate the Commission's leadership before the international community in ensuring that sufficient mmW spectrum is made available for future broadband services, including services provided by both terrestrial and satellite means.

III. SATELLITE AND TERRESTRIAL USERS CAN COEXIST IN THE 50.4-52.4 GHZ BAND THOUGH REASONABLE SPECTRUM SHARING STRATEGIES

Both terrestrial and satellite providers are critical for extending broadband service to all Americans, and they both require sufficient spectrum to do so. This does not, however, require the Commission to make an either/or choice between two valuable services. Instead, the Commission can and should take advantage of the fact that terrestrial and satellite providers generally use spectrum in different ways, which support opportunities for reasonable and equitable sharing strategies that can maximize service and extract the most utility from limited spectrum.

Comments in response to the Commission's Spectrum Frontiers Further Notice underscore the limited coverage contemplated for 5G services in mmW spectrum. For terrestrial

[13] *Petition* at 4.

wireless, AT&T reports that "5G deployments will be driven by small cell network builds, meaning that urban and rural use cases may differ significantly."[14] CTIA elaborates that "the millimeter wave bands will help strengthen 5G network capacity," likely in urban cores where demand is high and re-use can be maximized, but "mid- and low-band spectrum will continue to drive network coverage."[15] Comments from Qualcomm confirm this approach, noting that "5G operations in spectrum bands above 24 GHz will provide ultra-high-speed service in high-traffic areas, supplementing 5G and 4G services that use sub-6 GHz spectrum to provide coast-to-coast connectivity."[16]

Satellite operators can work within a reasonable and equitable sharing framework in the 50.4-52.4 GHz band as long as they have sufficient freedom to locate earth stations where needed to support spectrum sharing, and have access to the 47.2-50.2 GHz band that is currently allocated on a primary basis for satellite uplinks. Lockheed Martin, for example, urged the Commission to "lean forward and embrace true flexibility for enabling new operational capabilities in a way that allows for innovation beyond terrestrial mobile wireless."[17]

SIA reiterates that the substantial demand for high speed broadband in urban areas and in the rest of the nation cannot be met by any one technology, and thus the spectrum needs of both satellite and terrestrial operators in the 50.4-52.4 GHz band must be accommodated, which can be accomplished through reasonable and equitable sharing approaches in this spectrum, and the retention of the current primary allocation of the 47.2-50.2 GHz band for FSS uplinks.

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[14] Comments of AT&T, GN Docket No. 14-177, *et al.*, at 7 (Sept. 30, 2016).

[15] Comments of CTIA, GN Docket No. 14-177, *et al.*, at 3 (Sept. 30, 2016).

[16] *Qualcomm Comments* at 4.

[17] Comments of Lockheed Martin, GN Docket No. 14-177, *et al.*, at 4 (Sept. 30, 2016).

IV. THE BOEING PETITION SHOULD BE CONSOLIDATED INTO THE SPECTRUM FRONTIERS PROCEEDING

SIA supports the recommendations of comments to the Spectrum Frontiers Further Notice to consider Boeing's Petition within the context of the Spectrum Frontiers proceeding. Specifically, comments filed by Inmarsat, ViaSat and Qualcomm in response to the Spectrum Frontiers Further Notice each acknowledge Boeing's Petition and the interrelated nature of the requests in the Petition and the proposals for the 50.4-52.4 GHz band in the Further Notice.[18] Given the importance of these bands to the FSS community's V-band deployment strategy, and the importance of FSS to the national broadband deployment strategy, evaluating the adoption of domestic allocations for FSS in the 50.4-52.4 GHz band requires an assessment that takes into consideration the full operating environment.

Notably, in the Spectrum Frontiers Further Notice the Commission already contemplates FSS operation in the 50.4-51.4 GHz portion of the band pursuant to the existing primary FSS allocation and requests comment on the means of accommodating sharing between terrestrial and satellite operations in this band segment.[19] With respect to the 51.4-52.4 GHz band, SIA proposes that the Commission issue a public notice in the Spectrum Frontiers dockets to formally consolidate the Boeing Petition in to that larger proceeding. Such a public notice would ensure that all interested parties have proper notice of the related issues and would avoid the need to issue a Further Notice to propose satellite use of the 51.4-52.4 GHz portion of the band.

[18] *See C*omments of Inmarsat, Inc., GN Docket No. 14-177, *et al*., at 19 (Sept. 30, 2016); Comments of ViaSat, Inc., GN Docket No. 14-177, *et al*., at 14 (Sept. 30, 2016); Comments of Qualcomm Incorporated, GN Docket No. 14-177, *et al*., at 11 (Sept. 30, 2016).

[19] *See Spectrum Frontiers Further Notice* at ¶ 421.

V. CONCLUSION

SIA supports the proposal for additional FSS uplink spectrum in the 50.4-51.4 GHz and 51.4-52.4 GHz bands on a co-primary basis. The five gigahertz block of uplink spectrum is critical to enabling very high data-rate V-band satellite broadband systems that offer the opportunity to provide a high-quality, nationwide broadband option to definitively address the many "broadband gaps" of Americans that are unserved or underserved by terrestrial broadband. In addition, SIA requests that these issues addressed in Boeing's Petition be consolidated within the Spectrum Frontiers proceeding and to be considered within the context of that larger proceeding.

Respectfully submitted,

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