



August 4, 2017

VIA ELECTRONIC FILING

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: *Ex Parte* Presentation, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, GN Docket No. 14-177; IB Docket No. 15-256; RM 11664; WTC Docket No. 10-112; IB Docket No. 97-95

Dear Ms. Dortch:

The Satellite Industry Association (“SIA”)¹ submits this filing² to address the recent CTIA ex parte entitled “A Roadmap for High Band Spectrum” (“CTIA Filing”).³ The CTIA Filing provides a proposal for the use of spectrum above 24 GHz that discounts the role of competitive platforms in the evolving 5G ecosystem. By referring to the framework adopted by the Federal Communications Commission (“Commission”) in the 27.5-28.35 GHz (“28 GHz”) and 37.5-40 GHz (“37/39 GHz”) bands in the Spectrum Frontiers Report and Order⁴ as a “down payment” on spectrum for the wireless industry, CTIA attempts to frame 5G as a service that only terrestrial wireless providers can deliver.⁵ CTIA’s position neglects the key differentiating factor of the 5G ecosystem: that 5G is to be a heterogeneous network of networks. If adopted, CTIA’s position would represent an

¹ SIA Executive Members include: The Boeing Company; AT&T Services, Inc.; EchoStar Corporation; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; Ligado Networks; Lockheed Martin Corporation; Northrop Grumman Corporation; OneWeb; SES Americom, Inc.; Space Exploration Technologies Corp.; SSL; and ViaSat, Inc. SIA Associate Members include: ABS US Corp.; Artel, LLC; Blue Origin; DigitalGlobe Inc.; DataPath Inc.; DRS Technologies, Inc.; Eutelsat America Corp.; Global Eagle Entertainment; Glowlink Communications Technology, Inc.; Hughes; Inmarsat, Inc.; Kymeta Corporation; L-3 Electron Technologies, Inc.; O3b Limited; Panasonic Avionics Corporation; Planet; Semper Fortis Solutions; Spire Global Inc.; TeleCommunication Systems, Inc.; Telesat Canada; TrustComm, Inc.; Ultisat, Inc.; and XTAR, LLC.

² This submission is supported by all SIA members except for AT&T and Ligado, which abstain from participation.

³ Ex Parte of CTIA in GN Dkts No. 14-177 et. al filed July 14, 2017 (“CTIA Filing”).

⁴ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, (31 FCC Rcd. 8014)(2016).

⁵ The CTIA Filing actually makes reference to the 37.0-40.0 GHz band, but likely intended to reference the 37.5-40.0 GHz band.

unjustified and unsustainable abandonment of the Commission's long-standing commitment to the principle of technology neutrality. Furthermore, the United States has a strong interest in demonstrating continued innovation and global leadership in the development of advanced space technologies, a sector to which the commercial satellite industry contributes greatly. SIA strongly encourages the Commission to disregard the CTIA Filing as contrary to the national and public interest.

The Satellite Industry is a \$260 Billion Industry and Growing

SIA's recent "2017 State of the Industry Report" demonstrates that growth in the overall satellite industry continues, with global satellite revenues increasing by two percent during 2016, to over \$260 billion.⁶ Satellite delivered services remain the largest industry segment, with competitive consumer services including satellite television, radio, and broadband continuing to be the primary sources of revenue. Additionally, satellite ground equipment revenue has grown by seven percent year-over-year, led by satellite navigation and chipset sales supporting location-based services and devices.⁷

Over the course of the year, the growing importance of the satellite industry was once again underscored by both the continued increase in the number of operational satellites placed into orbit and by the announced plans for new satellites and vast constellations with increasing and diverse capabilities. The number of operational satellites saw an increase from 1,381 at the end of 2015 to 1,459 by the end of 2016.⁸

As new and advanced systems are deployed today and further developed for deployment later this decade, there is a resounding focus on the next generation of satellite designs and operations to form an essential component of the 5G ecosystem. The new ViaSat-2 satellite launched in June soon will deliver broadband speeds of up to 100 Mbps across America, and the EchoStar XIX satellite also launched this year is delivering ubiquitous broadband service throughout the country above Commission-defined speeds of 25/3 Mbps.⁹

⁶ Satellite Industry Association, *2017 State of the Industry Report*, 1, 4 (June 2017), <http://www.sia.org/wp-content/uploads/2017/07/SIA-SSIR-2017.pdf>.

⁷ *Id.*

⁸ See generally *id.* at 8; Satellite Industry Association, *2016 State of the Industry Report*, 1, 8 (June 2016), <http://www.sia.org/wp-content/uploads/2016/06/SSIR16-Pdf-Copy-for-Website-Compressed.pdf>. Over the past five years the satellite industry saw a growth of 47% in operational satellites. See Satellite Industry Association, *2017 State of the Industry Report*, at 1, 8 (June 2017), <http://www.sia.org/wp-content/uploads/2017/07/SIA-SSIR-2017.pdf>.

⁹ See Hughes, *Press Release: Hughes Announces HughesNet Gen5 High-Speed Satellite Internet Service*, <https://www.hughes.com/who-we-are/resources/press-releases/hughes-announces-hughesnet-gen5-high-speed-satellite-internet> (Mar. 07, 2017); ViaSat, *Press Release: ViaSat-2 Successfully Launched*, <https://www.viasat.com/news/viasat-2-successfully-launched> (June 2, 2017).

Also in June of this year, the first of the new non-geostationary orbit (“NGSO”) constellations, OneWeb, received its Commission authorization for operations in the Ka and Ku bands.¹⁰ There are still 13 applications for further NGSO constellations to be granted market access in the Ku, Ka, V, and Q bands¹¹ pending at the Commission.¹² While these new NGSO constellations await regulatory approval, Iridium is in the process of launching its second generation of NGSO satellites – with twenty new satellites having already been placed in orbit. Moreover, the next generation of high throughput geostationary orbit (“GSO”) satellites is also being planned, as demonstrated by the pending Commission application for the HNS 95WL satellite being constructed for Hughes Network Systems, LLC,¹³ and more are expected to follow.

Satellite Broadband is Part of the 5G Infrastructure

As progress is made on the development of standards for 5G for satellite at 3GPP,¹⁴ and as state of the art satellites continue to provide higher throughputs and capacities while maintaining nationwide and global coverage, satellites must continue to be part of the Commission’s vision for the 5G network of networks if 5G is to realize its mobility and coverage potential. All of this holds tremendous promise for users across the country, whether for vehicular, aircraft and maritime communications, the Internet of Things, public safety and national security, or any number of other critical use cases.

¹⁰ *WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb System*, IBFS File No. SAT-LOI-20160428-00041 (adopted June 22, 2017).

¹¹ 11.7-12.7 GHz and 14-14.5 GHz (“Ku Band”); 17.7-20.2 GHz, 27.5-30 GHz (“Ka Band”); 30-50 GHz (“Q Band”); 40-75 GHz (“V Band”).

¹² See O3b Limited (“O3b”), Application, IBFS File No. SAT-AMD-20161115-00116 (Filed Nov. 15, 2016); Telesat Canada (“Telesat”), Application, IBFS File No. SAT-LOI-20161115-00108 (Filed Nov. 15, 2016); Space Norway AS (“Space Norway”), Application, IBFS File No. SAT-LOI-20161115-00111 (Filed Nov. 15, 2016); LeoSat MA, Inc. (“LeoSat”), Application, IBFS File No. SAT-LOI-20161115-00112 (Filed Nov. 15, 2016); Karousel LLC. (“Karousel”), Application, IBFS File No. SAT-LOA-20161115-00113 (Filed Nov. 15, 2016); The Boeing Company (“Boeing”), Application, IBFS File Nos. SAT-LOA-20160622-00058 & SAT-AMD-20170301-00030 (June 22, 2016); ViaSat, Inc. (“ViaSat”), Petition for Declaratory Ruling, IBFS File No. SAT-PDR-20161115-00120 (Filed Nov. 15, 2016); Theia Holdings A, Inc. (“Theia”), Petition for Declaratory Ruling, IBFS File Nos. SAT-LOA-20161115-00121 & SAT-AMD-20170301-00029 (Filed Mar. 1, 2017); Audacy Corporation (“Audacy”), Application, IBFS File No. SAT-LOA-20161115-00117 (Filed Nov. 15, 2016); Space Exploration Holdings, LLC (“SpaceX”), Application, IBFS File Nos. SAT-LOA-20161115-00118 (Filed Nov. 15, 2016), SAT-LOA-20170301-00027 (Filed Mar. 01, 2017), & SAT-LOA-20170726-00110 (Filed July 26, 2017).

¹³ See Hughes Application, IBFS File No. SAT-LOA-20170621-00092 (filed June 21, 2017).

¹⁴ See, 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Study on New Radio (NR) to support Non Terrestrial Networks (Release 15), Technical Report, 3GPP TR 38.811 v.0.10 (June 06, 2017).

This is a very exciting time for the satellite industry, as more and more operational choices become available to support diverse uses across the United States. With the next generation of systems planned for the frequency bands above 37 GHz, satellite operators will be fully able to provide solutions that are part of the 5G ecosystem, including speeds exceeding 100 Mbps. Accordingly, as the Commission continues its analysis in the Spectrum Frontiers proceeding, it is critical to ensure that sufficient spectrum is available for all competitive and complementary platforms, including satellite, across multiple frequency bands – low, mid- and, of course, high.

Balanced Spectrum Policy is Needed to Ensure Competition and Innovation Across Platforms

To this end, SIA supports the adoption of a truly balanced approach to the use of the spectrum under consideration in the Spectrum Frontiers Further Notice of Proposed Rulemaking (“FNPRM”)¹⁵ and opposes CTIA’s unsupported request to identify additional bands solely for terrestrial wireless services. The CTIA Filing proposes a one-sided outlay for one service to be awarded use of more than 15 gigahertz of contiguous spectrum,¹⁶ while SIA urges the creation of a balanced framework that will enable competition and innovation among and between platforms, so that users across the United States can benefit from 5G services.

As the numerous satellite applications pending at the Commission demonstrate, this requires that the satellite industry have designated access to spectrum on a primary, co-primary, or shared basis in the 37/39 GHz, 40-42 GHz (“40 GHz”), 42-42.5 GHz (“42 GHz”), 47.2-48.2 GHz (“47 GHz”), 48.2-50.2 GHz (“48 GHz”), and the 50.4-52.4 GHz (“50 GHz”) bands. As discussed below, the 40 GHz and 48 GHz bands should be maintained as primary for core satellite operations, and could also be made available on a secondary, non-interference basis for terrestrial operations. A significant potential exists for sharing with terrestrial services in the rest of the needed satellite uplink and downlink bands; namely the 42 GHz, 47 GHz and 50 GHz bands.

In any event, given the importance of these bands for continued satellite growth, in none of these band segments should the Commission impose restrictions on satellite operations comparable to either (i) one individually-licensed earth station site per Partial Economic Area (“PEA”) limit, as proposed in the FNPRM, or (ii) the restrictions adopted in the 28 GHz and 37/39 GHz band segments.¹⁷

¹⁵ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, (31 FCC Rcd. 8014)(2016).

¹⁶ See CTIA Filing at 2.

¹⁷ See, e.g., O3b Comments at 7-8; Inmarsat Comments at 18; Boeing Comments at 19-20.

It bears emphasis that the Commission established 40 GHz and 48 GHz bands as being dedicated for satellite use, recognizing: (i) the need for satellite networks to be able to operate in certain spectrum without impediment by terrestrial operations; (ii) the need to provide certainty for business planning; and (iii) the need to be able to widely-deploy all types of earth stations anywhere within the authorized satellite coverage area in an unfettered manner. This is also consistent with the International Telecommunication Union (“ITU”) designation for high-density fixed-satellite operations in the 48 GHz and the 40 GHz bands.¹⁸

Commenters agree that the 40 GHz and 48 GHz band segments must be maintained for satellite operators to have the ability to deploy large numbers of user terminals and individually-licensed earth stations, in an unfettered manner.¹⁹ The satellite industry is beginning to deploy next-generation systems in the 40 GHz and 48 GHz bands based on the long-standing United States and ITU designations for primary satellite use of these band segments.²⁰ Notably, Inmarsat launched a network with 48 GHz capabilities in 2013,²¹ Boeing has filed applications with the Commission for satellite networks in these frequencies,²² and many other companies have filed similar applications to operate networks in connection with the Commission’s ongoing NGSO processing round for these frequencies.²³ Thus, maintaining primary access for satellite in the 40 GHz and 48 GHz bands is critical to providing the certainty needed for existing business plans.²⁴ No other spectrum above 30 GHz is currently available for wide-spread deployment by satellite operators.

Given the settled expectations of the satellite industry to be able to provide unimpeded, reliable service in these bands, SIA urges the Commission to reject requests by the

¹⁸ See Radio Regulations No. 5.516B; see also 47 C.F.R. § 2.106 n.5.516B.

¹⁹ See, e.g., GVF Comments on *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services* (“GVF Comments”), GN Docket No. 14-177 *et al* at 4-5; O3b Comments on *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services* (“O3b Comments”), GN Docket No. 14-177 *et al* at 6-7; Inmarsat Comments on *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services* (“O3b Comments”), GN Docket No. 14-177 *et al* at 17; SIA Comments on *Use of Spectrum Bands Above 24 GHz For Mobile Radio* (“SIA Comments”), GN Docket No. 14-177 *et al* at 14.

²⁰ SIA Comments at 12-13; see also GVF Comments at 2.

²¹ Inmarsat Comments on *Use of Spectrum Bands Above 24 GHz For Mobile Radio* (“Inmarsat Comments”), GN Docket No. 14-177 *et al* at 18.

²² Boeing Comments on *Use of Spectrum Bands Above 24 GHz For Mobile Radio* (“Boeing Comments”), GN Docket No. 14-177 *et al* at 3, citing The Boeing Company Application for Authority to Launch and Operate a Non-Geostationary Low Earth Orbit Satellite System in the Fixed Satellite Service (S2966), File No. SAT-LOA-20160622-00058 (filed June 22, 2016).

²³ See Boeing Comments at 3; GVF Comments at 2; Inmarsat Comments at 17; O3b Comments at 5; SIA Comments at 3.

²⁴ See SIA Comments at 13; O3b Comments at 7.

wireless industry to relegate satellite use of the 40 GHz and 48 GHz bands to secondary status in order to repurpose these bands for terrestrial use.

Furthermore, limiting satellite spectrum use to the 50 GHz band, for what CTIA mistakenly calls “satellite feeder links”, is unnecessary, unwise, and will result in an inefficient use of the spectrum resource. While the CTIA Filing offers satellites the right to use, on a shared basis, the 71-76 GHz and possibly the 81-86 GHz band, this is inadequate to meet the needs of users across the United States today, and is especially insufficient to meet the growing demand going forward. The satellite industry has developed, and is readying to deploy, the technology necessary to operate efficiently in the Q and V bands. With respect to the bands above 70 GHz, however, the satellite industry, like the terrestrial industry, is still years away from having a market-ready product to offer. The required equipment must overcome significant propagation obstacles inherent in the bands above 70 GHz for long-distance links, including increased free space path and atmospheric losses.

CTIA’s ‘Spectrum Roadmap’ Would Have the Impractical and Harmful Result of Shifting Essential Satellite Services to Unusable Bands

CTIA’s poorly-crafted proposal could be characterized as spectrum speculation and anticompetitive due to the harm the proposal would bring upon the satellite industry. CTIA has identified twelve spectrum bands,²⁵ half of which are not included in any current rulemaking proceeding,²⁶ for which it urges the Commission to immediately implement service rules that would grant either exclusive use or primary status to terrestrial wireless services. Leaving aside the procedural shortfalls, CTIA fails to justify the need for this huge swath of spectrum, much of which is currently allocated or designated for satellite use. In fact, CTIA makes only an unsubstantiated claim of an imprecise “need for rapid deployment of terrestrial 5G service.”²⁷ However, it is highly unlikely that any wireless provider, or indeed the wireless industry as a whole, is prepared or able to tackle “rapid deployment” in all of these bands. The development of band-specific devices and the costs of deployment in bands with challenging propagation

²⁵ CTIA identifies the 24.75-25.25 GHz (“24 GHz”), 25.25-27.5 (“26 GHz”), 27.5-28.35 GHz (“28 GHz”), 29.1-29.25 GHz (“29 GHz”), 31-31.3 GHz (“31 GHz”), 31.8-33.4 GHz (“32 GHz”), 37-40 GHz (“37/39 GHz”), 42-42.5 GHz (“42 GHz”), 47.2-50.2 GHz, 50.4-52.6 GHz, and 71-76 GHz (“70 GHz”) bands as bands that should have wireless primary status. See CTIA Filing at 2-3.

²⁶ The 24, 26, 29, 31, and 32 GHz bands are not included in the Spectrum Frontiers docket or any other open proceeding before the Commission.

²⁷ CTIA Filing, at 2.

constrains will require substantial lead time and investment; perhaps even longer than the still pending terrestrial deployment in the 28 GHz and 37/39 GHz bands.²⁸

All of the bands covered in the CTIA Filing face propagation issues even more challenging than those being faced in the 28 GHz and 37/39 GHz bands. As CTIA has already acknowledged in this proceeding, mobile services in these bands are “unlikely to deliver extensive coverage in a market but instead will be best suited to providing capacity via small cells and backhaul, particularly in densely populated areas.”²⁹ Widespread terrestrial deployment in the higher frequency bands where propagation is even more difficult, will be even more costly because more cells will be necessary.³⁰ CTIA’s claim that the mobile industry will deploy in all of these bands rapidly, and in a manner that requires exclusive use, is not credible and must be rejected.

Moreover, the CTIA Filing dismisses both the services that currently operate in certain of the proposed frequency bands, as well as the determinations previously made by the Commission on allocations thereto. CTIA proposes the 29.1-29.25 GHz (“29 GHz”) band for mobile broadband, but ignores the fact that at present the band is used on a primary basis, not only by LMDS stations, but also by NGSO mobile satellite service feeder links.³¹ CTIA ignores the presence of the latter service in the band.³² CTIA recognizes, however, that the Commission “declined to propose authorizing mobile operations in this band in the Spectrum Frontiers NPRM,” and that this determination could not be revisited without further notice and comment.³³ There is no current basis, therefore, for entertaining CTIA’s proposal.

The 40 GHz, 42 GHz, 47 GHz, 48 GHz, and 50 GHz bands are critical expansion bands for the satellite industry, where the requisite implementing technology has been developed and applications for both GSO and NGSO satellite networks are currently pending at the Commission. All the while, the CTIA Filing neglects to recognize even the potential for sharing with the satellite service, under balanced and equitable terms, in the bands for which CTIA seeks exclusive access.

²⁸ The terrestrial wireless industry is still developing business cases for just those two bands. See Kavita Majithia, *Blog: The challenge in presenting a 5G business case*, <https://www.mobileworldlive.com/blog/blog-presenting-the-5g-business-case/> (July 19, 2017).

²⁹ See Letter from Scott K. Bergmann (CTIA) to Marlene H. Dortch, GN Docket No. 14-177 *et al.*, at 2 (May 20, 2016).

³⁰ See Comments of Ericsson, Further Notice of Proposed Rulemaking, , GN Docket No. 14-177 *et al* at 13 (September 30, 2016).

³¹ See CTIA Filing at 3.

³² *Ibid.*

³³ *Id.* at 7 n. 29.

The Commission should not validate the one-sided nature of the CTIA Filing but rather should examine the bands at issue in this proceeding in a manner that recognizes the needs of the satellite industry and embraces technology neutrality and competition among platforms, including both advanced satellite and terrestrial mobile services. Access to low, mid-, and high band spectrum is required by all competitive technologies to ensure that all Americans, regardless of where they may live or work, are able to enjoy the benefits of the 5G ecosystem.

Please contact the undersigned if you have any questions or require any additional information.

/s/
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President
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