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
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM-11664
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
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95

COMMENTS OF THE EMEA SATELLITE OPERATORS ASSOCIATION

The EMEA Satellite Operators Association ("ESOA")[1] hereby submits these comments in response to the Federal Communications Commission's ("Commission") Notice of Proposed Rulemaking ("NPRM") in the above referenced proceeding.[2] Members of ESOA include companies who have operations around the world, including in the United States and its neighbouring countries.

While ESOA recognizes the need to develop new spectrum for future mobile terrestrial services in the United States, the Federal Communications Commission ("FCC" or "Commission") should re-consider its proposal in this proceeding in the light of the decision of the ITU Member States attending the recent World Radiocommunication Conference ("WRC-15") not to include the band 27.5-28.35 GHz ("the 28 GHz band") for terrestrial mobile service ("MS") providing 5G. Coordinated deployment on a global basis of MS and fixed satellite service ("FSS") stands to bear fruit in the long term to both industries. As such, the FCC should appropriately weigh the merits of global harmonization of spectrum currently in use by satellite operators around the world against domestic deployment of mobile service that has not yet been developed.

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[1] ESOA is a nonprofit organization established with the objective of serving and promoting the common Interests of European, Middle East and African satellite operators. The Association is the reference point for the satellite operators industry and today represents the interests of 30 members including satellite operators who deliver information communication services across the globe as well as space industry stakeholders and insurance brokers.

[2] Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, Notice of Proposed Rulemaking, FCC 15-138, 30 FCC Rcd. 11878 (2015) ("NPRM").

Furthermore, as the FCC considers new opportunities for the 28 GHz band, it should also consider an elevation in the status of the FSS earth station terminals operating in the band from secondary to primary.

I. Background

Recent U.S. satellite Ka-band[3] broadband deployment has benefited from substantial investment, with the launch of a new generation of satellites that are now offering increasingly robust broadband services to Americans.[4] For example, today the Hughes broadband satellite service provides up to 15/2 Mbps and ViaSat provides up to 12/3 Mbps.[5] O3b, which has offered full commercial service since September 1, 2014, has raised $460 million in order to add another eight satellites to its twelve satellite non-geostationary constellation. O3b's service is comparable to terrestrial fiber service because with its lower orbital altitude and high-power, spot-beam design, it provides latency between 120 ms and 150 ms.[6] In 2016, Hughes plans to launch Jupiter 2, which "will have more than 150 Gbps throughput – 50 percent greater capacity" than Jupiter 1.[7] These are just two examples of the many satellite providers that rely on the 28 GHz band to provide uplink services to their satellites.

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[3] 27.0-30.0 GHz / 17.7 20.2 GHz.

[4] 2014 Fourth Measuring Broadband America Report at 4-5; available at http://data.fcc.gov/download/measuring-broadband-america/2014/2014-Fixed-Measuring-Broadband-America-Report.pdf; see also id. at 15-16, 18,

5 See ViaSat, High-Capacity Satellite System, http://www.viasat.com/broadband-satellite-networks/high-capacity-satellite-system (last visited Jan. 20, 2015). According to Hughes, it currently provides satellite Internet service to approximately 935,000 U.S. subscribers utilizing its Jupiter 1 (EchoStar 17) and SPACEWAY 3 satellites with speeds up to 15 Mbps/2 Mbps. https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-10A1.pdf/

[6] O3b Limited Comments, submitted in GN 14-126 (filed Sept. 4, 2014).

[7] 2015 Broadband Progress Report, FCC 15-10, at ¶ 122 (2015).

The Commission's own report in 2015 on "Broadband Progress" shows the important role satellite services are playing in promoting broadband delivery in the United States.[8] Figure 1 shows that the level of penetration via satellite connectivity across the United States by Viasat Exede subscriber distribution maps almost exactly to United States population density.

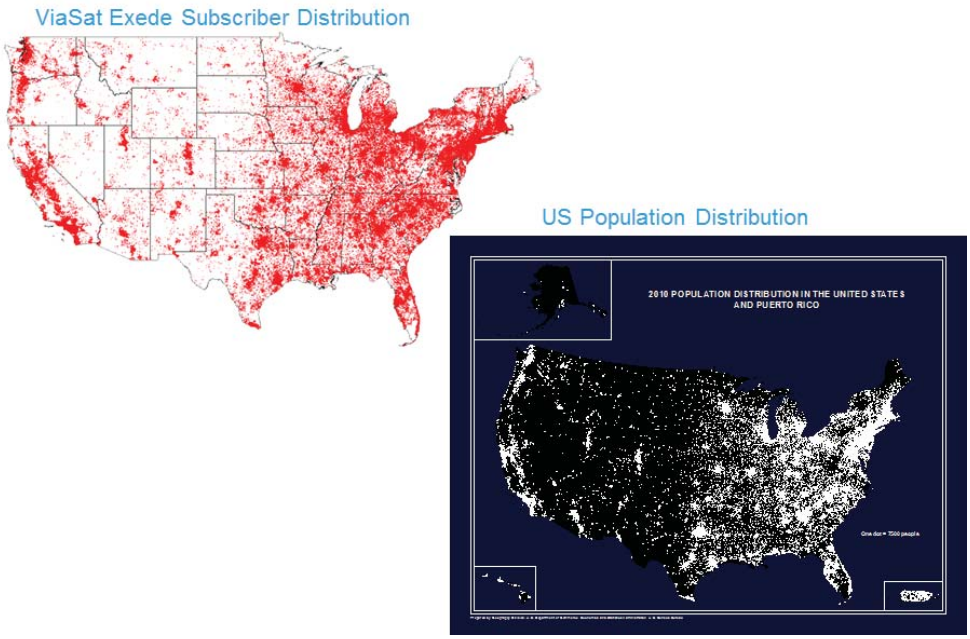

Figure 1: Satellite Subscriber Distribution[9]

The FCC Broadband Progress report states that satellite broadband service has improved significantly, and many consumers today have high speeds, low prices, and generous data usage allowances. Therefore the Commission's plans for terrestrial 5G systems should not be focused on the 28 GHz band in order to continue enabling the graceful development of satellite broadband in view of achieving a long term sustainable outcome for all Information

[8] *Id*
[9] ViaSat Exede Subscriber Distribution

and Communications Technology ("ICT") stakeholders of the 5G terrestrial and satellite industries.

Moreover, many satellite operators around the world currently operate, or have spent hundreds of millions of dollars already in their plans to operate, global and regional satellite services using the 28 GHz band. These satellite networks provide valuable services in many regions around the world, including broadband and terrestrial enabling services, which is why a sustainable and viable future growth in Ka-band needs to be protected. Today, the United States satellite industry is a world leader in the Ka-band space service development and proliferation with globally recognised skills in the manufacture of cutting-edge Ka-band satellites, producing a significant number of technical jobs for the US economy.[10]

II. The FCC Should Elevate FSS Services in the 28 GHz Band to Primary

The demand for satellite broadband services requires the deployment of multiple earth stations which connect customer terminals to the Internet. Such earth stations make use of large antennas to communicate with satellites to provide crucial feeder link and backhaul connectivity to customers. Due to their orientation towards space, very little RF interference is radiated towards the horizon where terrestrial stations could be located.

Consequently, the FCC has issued numerous licenses to FSS operators for such stations in the 28 GHz band. Given the practical experience which has demonstrated the minimal

[10] U.S. Satellite Industry Employment, as of the third quarter of 2013, had a total of more than 225,000. U.S. private sector employment in the satellite services. Ref: 2014 State of the Satellite Industry Report / http://www.sia.org/wp-content/uploads/2014/05/SIA_2014_SSIR.pdf

impact to terrestrial deployments, there is good cause for the FCC to elevate such earth stations to primary status. Co-primary status acknowledges well-established satellite use of the band in the U.S., and a flexible licensing regime that accommodates existing and future FSS earth station deployment in the U.S. will protect space assets that rely on this band globally.[11]

Allowing the FSS to access the 28 GHz spectrum on a primary basis serves the public interest by providing much needed bandwidth for broadband by satellite. Consumers of broadband draw from the Internet much more data than they generate (e.g. video, web browsing). The result of this data asymmetry is that the traditional downlink spectrum is saturated, so earth stations need additional spectrum in the reverse direction. To meet this requirement, the satellite operators have a pressing need for spectrum in the Earth-to-space direction in order to meet the ever growing data needs of consumers.

The Commission should promote best practices in broadband deployment and adoption by supporting policies that foster a diversified marketplace based on different types of communications technologies, and not focus primarily on a single technology, such as terrestrial mobile services. It is thus critical that FSS operators be allowed to continue deploying FSS earth stations in the band and have certainty that they will be able to access the spectrum in the future, so that they can provide broadband services with data rates comparable with terrestrial deployments.

[11] For example O3b satellite network operates its uplinks worldwide today in the 27.6 - 28.4 GHz frequency band, and its global Network Operations Center is located in the U.S.

As the FCC revisits its rules for the 28 GHz band, ESOA would propose the adoption of rules allowing primary operation of FSS earth stations in this band.[12] Doing so would give FSS operators the confidence required to continue their multi-million dollar infrastructure investment in the construction of satellites and earth stations that make use of the band and protect the manufacturing jobs that have been and will be created through the continued satellite growth in this band.

III. The FCC Should Encourage International Harmonization for All Potential Services and Exclude the 28 GHz Band from Consideration

International harmonization was one of the four main criteria the Commission used to choose the bands under consideration for mobile terrestrial service in the NPRM.[13] The Commission recognized that such harmonization, if it can be achieved "reduce[s] development and equipment costs and promotes a unified world market."[14] Internationally harmonized satellite spectrum is key for the satellite industry as well. Because satellite operators both in and outside the United States will operate satellites in the 28 GHz band, it is important that spectrum be harmonized to allow ground station equipment manufacturers to scale their production and thereby reduce costs.

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[12] The FCC has two regulatory models for co-primary FSS which it can use to craft such rules. The first such example is in the band 37.5-40.0 GHz in which the Commission authorized the deployment of FSS gateway stations. The second is a Canadian country footnote which also allows for a limited deployment of FSS gateway stations that do not disrupt the deployment of the FS in the band. See FN C47A (2014) in the Canadian Table of Frequency Allocations at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10759.html. Both examples demonstrate a recognition of the limited impact of the FSS earth station deployment in the band and provide a regulatory mechanism to do so.

[13] NPRM at ¶ 21.

[14] *Id*.

WRC-15 concluded that the ITU-R should conduct studies prior to WRC-19 on possible additional spectrum allocations for mobile services on a primary basis as recorded in Resolution 238 (WRC-15). A key outcome of Resolution 238 was the rejection of the 27.5 – 30.0 GHz band from any consideration. If the Commission proceeds with its proposal to allow mobile terrestrial operations in the 28 GHz band, it would not only jeopardize the U.S. satellite industry's growth, U.S. jobs and investment in this band but it would also undermine the ITU-R's ability to achieve international harmonization of other bands for terrestrial 5G.

IV. The 31.8-33.4 GHz Spectrum Band Is More Suitable for IMT Development

Rather than proceed to develop mobile terrestrial services in a band that has been deemed ill-suited on the international level for such applications, the Commission should give consideration to the 31.8-33.4 GHz band (the "32 GHz band") for mobile terrestrial services.

ESOA suggests that the Commission consider the 32 GHz band as an alternative to the 28 GHz band in light of the outcome of the WRC-15, and work with relevant stakeholders to examine its suitability for mobile IMT/ 5G services. Some 5G proponents, including Samsung which has been a pioneer in the development of 5G trials in the United States, have also identified the 32 GHz band as a recommended spectrum band and also urge the Commission to consider and prioritize the 32 GHz band.[15]

Specifically, the 32 GHz band offers a large bandwidth block using current state of the art technology. For instance, 1.2 GHz of bandwidth could be covered by one Radio Frequency

[15] Samsung ex parte, filed in GN Docket No. 14-177; at 2 (submitted August 28, 2015)

("RF") component using a center frequency of 32.4 GHz as an example. It is expected that such a frequency range could be implemented by one single device to facilitate global roaming by 2020.[16]

The Commission has noted with concern that this band currently has no mobile allocation, whereas there are existing mobile allocations for other bands under consideration. This concern, however, can be addressed following the sharing and compatibility studies approved by WRC-15 for completion prior to WRC-19. Based on the result of these studies, a new internationally harmonized mobile service allocation can be made.

The Commission also noted concern for protecting services operating in or adjacent to the 32 GHz band. ESOA believes that such concerns can be addressed with carefully crafted operating requirements. Additionally, deep-space research operations in the adjacent band could easily be protected from mobile terrestrial operations in this band because such research facilities are few in number and are located in very remote areas that would provide protection from interference.

V. Conclusion

For the foregoing reasons, ESOA requests that the Commission aligns its deployment of IMT/ 5G by favouring the 32 GHz band instead of the 28 GHz band for mobile terrestrial deployment considering the significant investment that has been made and is being made in the 28 GHz band by the satellite industry as well as the importance of this band for delivery of

[16] ITU-R Report M.2376-0 Technical feasibility of IMT in bands above 6 GHz

broadband services via satellite. Moreover, ESOA encourages the Commission to consider an elevation from secondary status to primary for the limited number of present and future FSS earth stations to be deployed in the 28 GHz band.

Respectfully submitted

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January 27th, 2016