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 the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands	)	ET Docket No. 95-183 (Terminated)
	)	
Implementation of Section 309(j) of the Communications Act – Competitive Bidding, 37.0-38.6 GHz and 38.6-40.0 GHz Bands	)	PP Docket No. 93-253 (Terminated)
	)	
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM-11664

COMMENTS OF THE EUROPEAN SATELLITE OPERATORS ASSOCIATION (ESOA)

The European Satellite Operators Association ("ESOA")[1] hereby submits these comments in response to the Federal Communications Commission's ("Commission") Notice of Inquiry ("Inquiry")[2] in the above-referenced proceeding.

[1] ESOA is a non-profit European organisation 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 European 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.

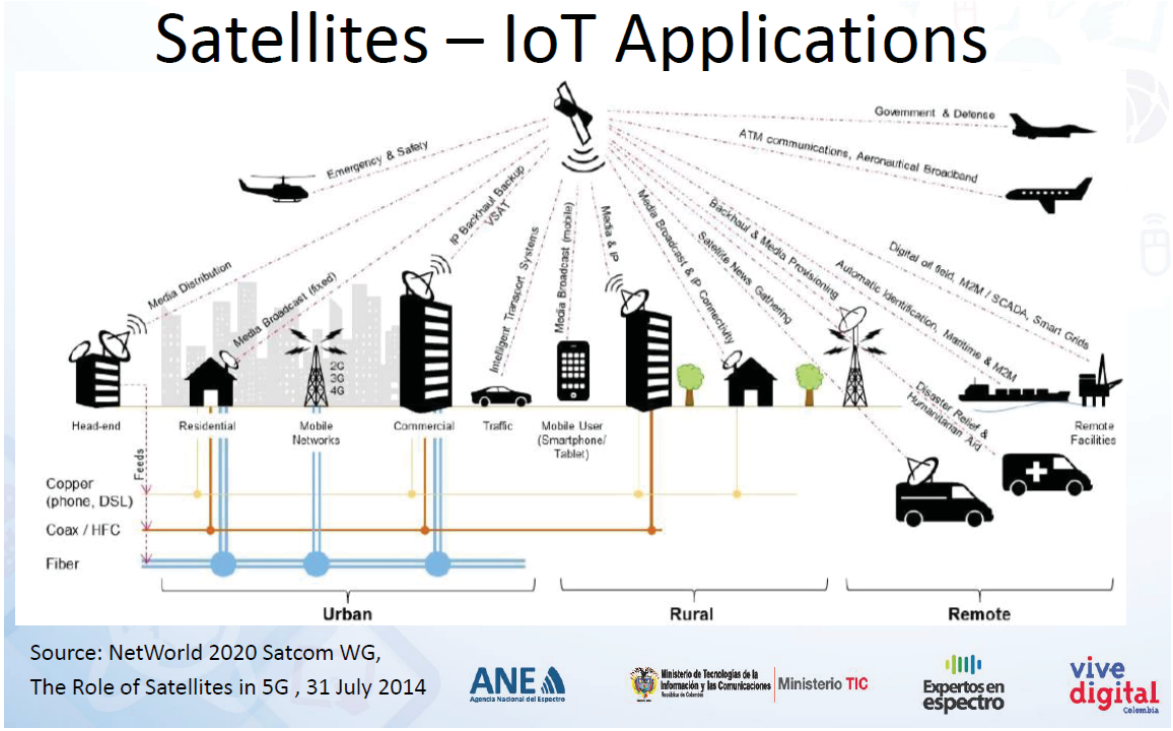
[2] FCC 14-154 of 17 October 2014

Members of ESOA include several companies who are also members in the Satellite Industry Association (SIA) and have operations in various parts of the world, including in the United States and its neighbouring countries.

Numerous frequency bands above 24 GHz are currently well used or planned to be used for a large number of satellite services, including satellite communications systems operating in the Ka-band frequencies. Satellite operators are also designing solutions for services in Q- & V-band frequencies.

Many satellite operators around the world operate or plan to operate global or regional satellite services using Ka-band frequencies. These satellite networks do and will provide valuable services in many regions around the world including enabling terrestrial services. For example, Arabsat, Avanti, EchoStar, Eshailsat, Eutelsat, Gascom, Hispasat, Inmarsat, Intelsat, Nilesat, Nigcomsat, O3b, RSCC, SES, Telenor, Telesat, Thaicom, Turksat, Viasat, Yahsat, and the governments of Brazil, Australia and France currently operate or plan to operate satellite systems within the 24.65-25.25 / 17.3-17.8 / 21.4-22 GHz and 27.0-30.0 / 17.7-20.2 GHz Ka-band frequencies.

As explained by SIA in its comments, satellites often provide broadband access technologies. Billion dollars of investment have already been spent on these satellite networks particularly in the Ka-band frequencies between 24 and 31 GHz. Regulatory certainty is required by Ka-band satellite operators and their service providers to enable sustainable and viable access to Ka-band spectrum. Similarly, access to 40-75 GHz V-band frequencies that are already allocated by the ITU to satellite services on a primary or co-primary services ought to be preserved.



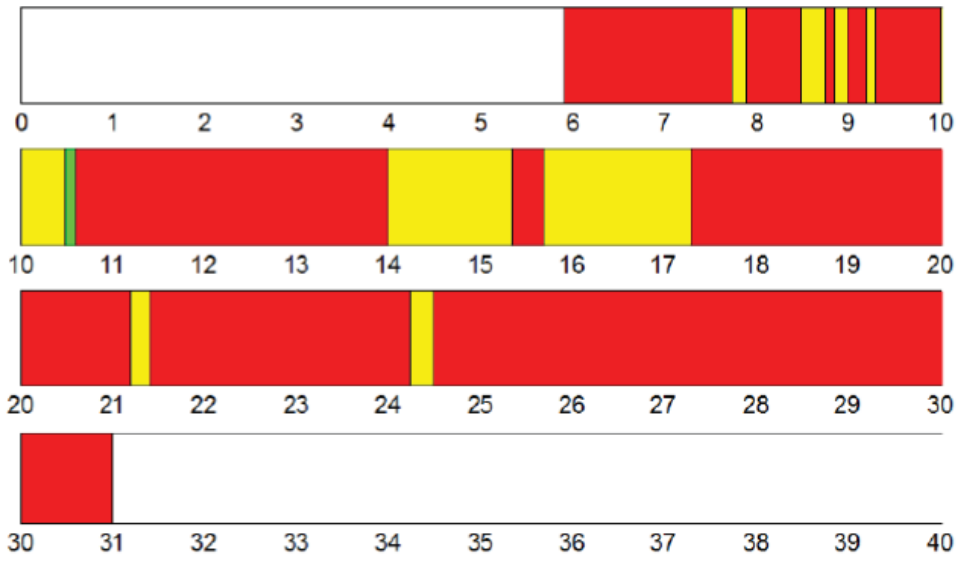
Spectrum for 5G Mobile Services Should be Looked At Above 31 GHz

Additional spectrum for 5G mobile services should not be considered at the expense of other radio services that are an integral part of the global broadband infrastructure and telecommunications ecosystem. It has been recognized that satellites are indeed a key component of these infrastructure and ecosystem, and many countries rely on satellites to provide video services to everyone, essential backhaul to mobile terrestrial communications, ubiquitous broadband access to citizens or critical emergency and governmental services.[3]

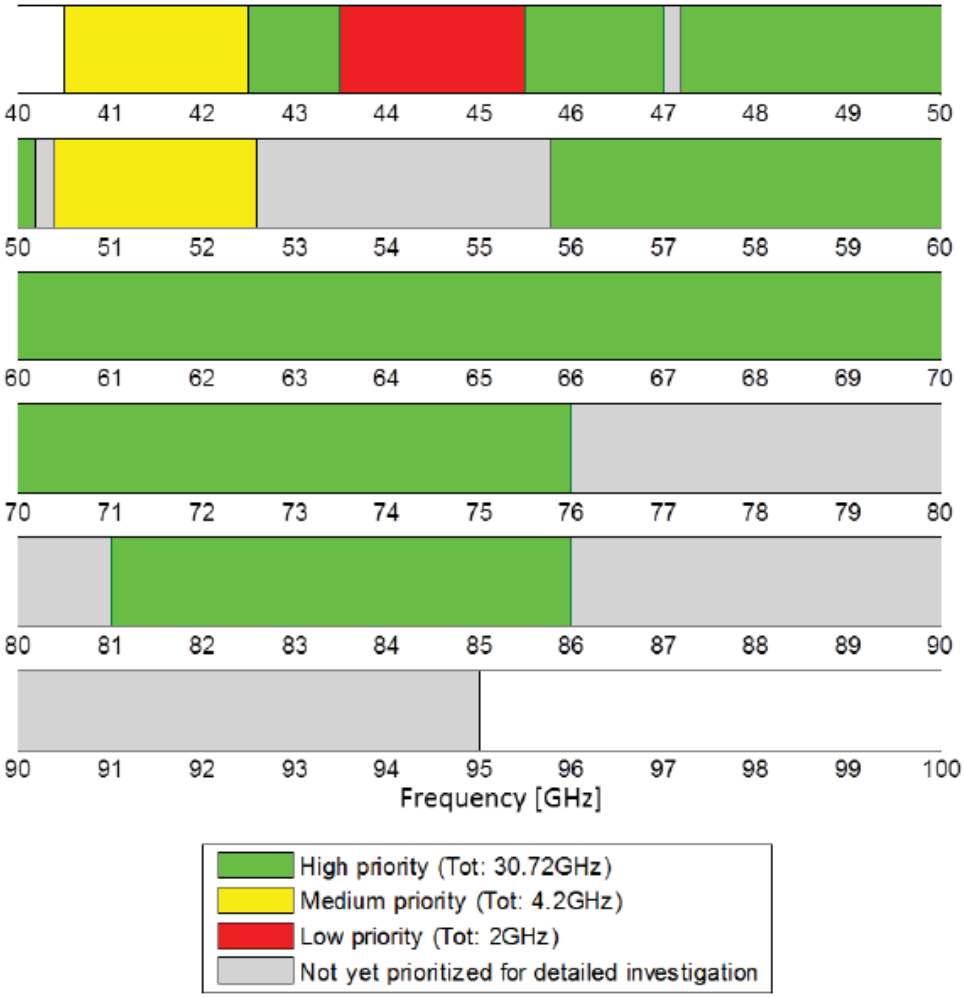
For the deployment of future 5G mobile services, more opportunities exist in spectrum that is in higher millimetre Wave ("mmWave") frequencies (above 31.0 GHz) than in lower sub-mmWave bands (between 6 – 31.0 GHz). This is due to the significantly increased isolation between co-existing terrestrial radio systems that follows from propagation properties in the

[3] See for instance : **Regulation of global broadband satellite communications, ITU-D report from April 2012** (from: www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports_RegulationBroadbandSatellite.pdf) or **SATCOM for US general services administration** (from: www.gsa.gov/portal/content/105299)

mmWave bands. The European METIS studies to which the FCC refers note this factor.[4] In addition, it seems that wide bands of contiguous spectrum (up to 1 GHz and even above) are being sought. As reflected in the METIS diagrams below, and in more detail in the METIS report itself, such bands are difficult to find in lower frequencies due to current regulation, allocations and usage.



[4] See **Mobile and wireless communications Enablers for the Twenty-twenty Information Society ("METIS") - Description of the spectrum needs and usage principles** (from : www.metis2020.com/wp-content/uploads/deliverables/METIS_D5.3_v1.pdf)



The METIS study assessed the priority that should be assigned to the potential use of different parts of the bands above 6 GHz for high density mobile services. “Low priority” indicates that the chances of successfully using a particular part of the spectrum above 6 GHz for such services are rather low, and similarly for medium and high priority. It can be concluded from the METIS study that the bands above 31 GHz should be considered with **high** priority, as they are, as shown in the diagrams, considered more favourable from a regulatory and technical view point.

It is to be well noted that technology solutions for 5G mobile services are being trialled in various frequency bands above 31 GHz. For example, Samsung has tested 5G systems at circa 39 GHz and high capacity RLANs at circa 61 GHz.[5]

Furthermore, at least one major mobile operator has suggested that bands in the 43.5-47 GHz range be considered for 5G mobile, and that it would be desirable to avoid compatibility issues in satellite spectrum allocations.[6]

Therefore, ESOA believes that any new techniques and technologies to facilitate long term coexistence with other space and terrestrial services and applications which are currently, or may in future be, deployed should be focused on spectrum above 31 GHz and be identified outside the frequency bands already allocated by the ITU on a primary or co-primary basis to satellite services (such as in V Band), for the reasons explained above. A long term sustainable outcome for all ICT stakeholders of the 5G terrestrial and satellite industries in the 21st century digital economy should be achievable at this condition.

Respectfully submitted,

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[5] Field trials conducted "at New York University and the University of Texas with funding from the US Army and Samsung… found that **39GHz mobile base stations can sustain 100 percent coverage in cells with a 200-meter radius in high-density urban areas**," the FCC said. (from: http://arstechnica.com/information-technology/2014/10/gigabit-cellular-networks-could-happen-with-24ghz-spectrum-fcc-says/) and **Samsung develops 60GHz WiFi capable of 4.6Gbps, will be in devices next year** (from: http://www.extremetech.com/computing/191872-samsung-develops-60ghz-wifi-capable-of-4-6gbps-will-be-in-devices-next-year)

[6] See Vodafone response to UK Ofcom consultation on WRC-15: http://stakeholders.ofcom.org.uk/consultations/wrc15/?showResponses=true&pageNum=8#responses