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 SATELLITE INDUSTRY ASSOCIATION

The Satellite Industry Association ("SIA")[1] hereby submits comments in response to the Commission's Notice of Inquiry ("NOI") in the above-referenced proceeding.[2]

[1] SIA is a U.S.-based trade association providing worldwide representation of the leading satellite operators, service providers, manufacturers, launch services providers, and ground equipment suppliers. Since its creation twenty years ago, SIA has advocated for the unified voice of the U.S. satellite industry on policy, regulatory, and legislative issues affecting the satellite business. SIA Executive Members include: The Boeing Company; The DIRECTV Group; EchoStar Corporation; Harris CapRock Communications; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; LightSquared; Lockheed Martin Corporation; Northrop Grumman Corporation; SES Americom, Inc.; SSL; and ViaSat, Inc. SIA Associate Members include: ABS US Corp.; Airbus DS SatCom Government, Inc.; Artel, LLC; ATK Inc.; Cisco; Cobham SATCOM Land Systems; Comtech EF Data Corp.; DRS Technologies, Inc.; Eutelsat America Corp.; Glowlink Communications Technology, Inc.; Hughes; iDirect Government Technologies; Inmarsat, Inc.; Exelis, Inc.; Marshall Communications Corporation.; MTN Government; O3b Limited; Orbital Sciences Corporation; Panasonic Avionics Corporation; Row 44, Inc.; TeleCommunication Systems, Inc.; Telesat Canada; TrustComm, Inc.; Ultisat, Inc.; Vencore Inc.; and XTAR, LLC.

[2] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services,* GN Docket No. 14-177, *et al.,* Notice of Inquiry, FCC 14-154 (rel. Oct. 17, 2014).

I. INTRODUCTION AND SUMMARY

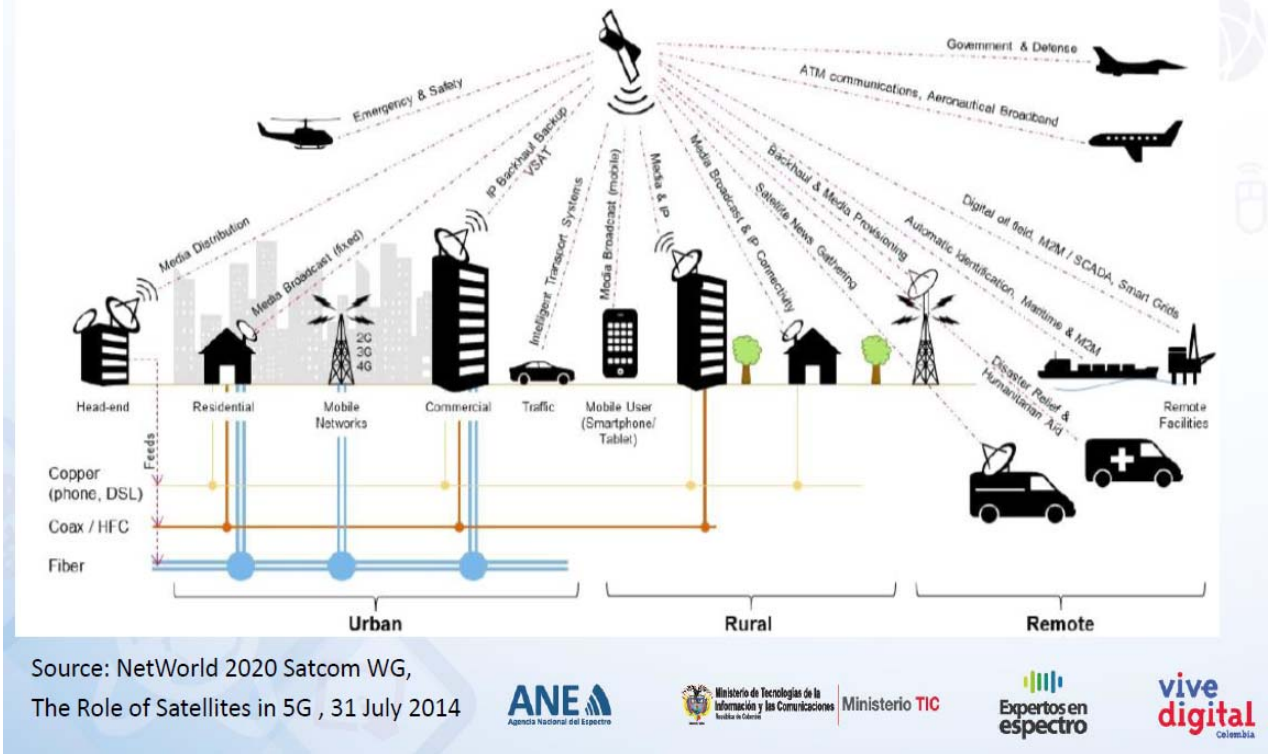
In the NOI, the Federal Communications Commission (the "Commission" or "FCC") seeks to examine the potential for the provision of mobile radio services in bands above 24 GHz. The Commission views this examination as taking place alongside efforts to develop technical standards for Fifth Generation ("5G") mobile services.

The satellite industry has a significant interest in this proceeding. Many innovative satellite services are currently provided and under development in the frequency bands above 24 GHz. Hughes and ViaSat provide a wide range of broadband services in these bands to a rapidly growing customer base, and will launch additional high throughput satellites ("HTS") in 2016. O3b, Inmarsat Global Xpress and Iridium are also launching innovative global broadband satellites operating in these bands to deliver truly critical services in the United States and worldwide. DIRECTV and DISH use this spectrum to provide High-Definition ("HDTV") services to tens of millions of subscribers and are developing the 17/24 GHz BSS band to even further expand their service offerings. Indeed, in light of burgeoning demand for broadband satellite services, satellite operators are now seeking access to additional spectrum above 24 GHz to satisfy existing and anticipated requirements as the Ku- and 20/30 GHz bands are nearing capacity.

The NOI identifies five sets of bands that satellites use or expect to use: the LMDS Bands, the 24 GHz Bands, the V-band (39 GHz and 37/42 GHz), the 60 GHz Bands, and the 70/80 GHz Bands (collectively, the "Identified Satellite Bands"). In these comments, SIA describes the unique, vital, and indispensable role that satellites play in the U.S. communications ecosystem, and documents the nature of the services that the satellite industry provides, and expects to provide, in the Identified Satellite Bands.

II. SATELLITES PLAY A VITAL ROLE IN THE U.S. COMMUNICATIONS ECOSYSTEM.

As illustrated in the figure below, satellites play an essential and under-acknowledged role in the U.S. communications ecosystem and in the promotion of longstanding Commission policy objectives – a role that is only expanding in response to growing demand for unique satellite services and the efforts of industry to meet it. In these circumstances, SIA submits that it is essential that adequate regulatory certainty remain about the ability to use existing satellite spectrum to warrant continued investment in innovations by satellite operators. As consumer demand continues to increase for advanced communications services, including satellite, the FCC should be acting to incentivize satellite operators' continued investment in new services by creating certainty in the use of satellite spectrum. Any effort that reduces certainty would likely have a negative impact on the availability of innovative, cost-effective, important satellite services to U.S. consumers.



Source: NetWorld 2020 Satcom WG,
The Role of Satellites in 5G , 31 July 2014

A. Satellite Services Are Unique and Indispensable

The U.S. satellite industry continues to grow robustly. Revenues have grown steadily since 2008 to nearly $86 billion in 2013, over half of which is derived from consumer services such as satellite television and broadband. Given this increase in essential satellite-based consumer services, SIA expects that 2014 revenue figures, when they become available, will reflect significant additional growth.

These figures demonstrate wide, and growing, market demand for the many and essential services satellite providers offer. Satellites distribute point-to-multipoint video and other high-bandwidth services more efficiently and cost effectively than any other technology. Direct-to-home ("DTH") satellite service and other advanced video services, including in bands above 24 GHz, are an important source of competition in the residential broadband and subscription video markets in areas that otherwise would be unserved or, at best, limited to a cable monopoly, a telco monopoly, or a cable-telco duopoly.

High throughput satellites are bringing broadband connectivity to rural and remote areas, thereby advancing the nation's broadband objectives. Innovative, advanced satellite services and technologies are being introduced that make broadband available on ships, on aircraft and on motor vehicles.

Satellites can also connect with users located nearly anywhere in the world and are extremely reliable given that they are unaffected by natural disasters, such as hurricanes and earthquakes, that can knock out terrestrial infrastructure. The reach, resilience, and reliability of satellites are unmatched by terrestrial networks, making satellite systems essential for day-to-day commercial and government operations, including the provision of consumer, public safety, and national security communications services in urban, suburban, rural and remote locations. As a result, satellites provide mission-critical voice and data services to industry, relief organizations, national security agencies, and the U.S. military. Critically for the Commission's present objectives, these characteristics enable satellite services to extend terrestrial mobile broadband networks by providing middle-mile backhaul links – including for tomorrow's 5G networks.

Spectrum certainty is important to both the terrestrial communications industry and the satellite industry. But spectrum certainty is more fundamental to the latter because a single satellite takes multiple years to design and construct, and once a spacecraft is launched, its design is locked in for the life of the satellite, which can run 15-20 years. Given these time frames, the satellite industry needs spectrum certainty to be able to attract and retain investment, and to have the confidence to invest in new facilities and technologies in response to customer demand.

B. Satellite Services Drive Competition and Innovation

In the United States, satellite delivery of news and entertainment that began as an innovative means of reaching populations unserved by terrestrial services resulted in increased competition in established markets. The result has been and continues to be vastly improved offerings and access to more cost-effective services for consumers all across America. Satellite direct-to-home ("DTH") service offering all-digital video and audio quickly became the first and most important source of competition for cable operators, and has since expanded with the introduction of additional frequency bands for DTH above 24 GHz, including the 20/30 GHz band and most recently the 17/24 GHz band.[3]

Satellite-delivered broadband is following a similar trajectory, reaching areas not served – and which may never be served – by terrestrial options and providing a competitive alternative in areas served by DSL, cable or wireless broadband. U.S. consumers of broadband services can choose from multiple 20/30 GHz band satellite service providers that can offer a wide range of applications that are comparable to terrestrial wireline and wireless broadband offerings. Satellite customers are able to download movies and music, conduct video

[3] *See, e.g.,* Press Release, "4K Ultra HD Gets a Lift with Successful DIRECTV Satellite Launch" (Dec. 6, 2014), available at http://www.directvpresscenter.com/press/?p=cdbf853a-a54b-45eb-86a5-51b1c72599b9 .

conferences, make and receive Voice over Internet Protocol ("VoIP") phone calls, browse web pages, engage in social media, and check e-mails.[4]

U.S. geostationary satellite networks in the 20/30 GHz band deployed by Hughes, ViaSat, and Inmarsat support a panoply of feature rich broadband offerings and are experiencing rapid growth in subscriptions. In fact, given the growth in market demand for such services, several companies are actively constructing additional, more advanced, high throughput and high capacity 20/30 GHz band satellites to expand their services. Hughes Networks Systems' broadband offerings will soon include the Jupiter 2 (EchoStar XIX) satellite, which "will have more than 150 Gbit/s throughput" and "next-generation architecture," and "more than 120 spot beams" that provide "high quality Internet coverage across the U.S."[5] With its next 20/30 GHz band satellite, ViaSat will also introduce higher capacity and seven times the current geographic coverage of ViaSat-1. A "first of its kind" design, ViaSat-2 will double the bandwidth economics of ViaSat-1 and will have coverage of the U.S., Central America, the Caribbean, and the main aeronautical and maritime routes over the Atlantic.[6]

There are some broadband applications that only satellite can deliver, such as providing broadband connectivity to airplanes in flight and to cruise and other ships traversing the oceans. ViaSat is already providing 20/30 GHz band aeronautical service over U.S. territory using ViaSat-1 and will be expanding this service across the Atlantic Ocean and beyond with ViaSat-2. In addition, Inmarsat has just launched the first of its Global Xpress satellites to provide mobile satellite services to all parts of the world, including all ocean regions, using the 20/30 GHz FSS frequencies. Inmarsat expects to launch two more Global Xpress satellites in 2015.

Unique broadband offerings are also on the horizon for non-geostationary satellite providers operating in the 20/30 GHz band. For example, O3b's twelve-satellite constellation of medium Earth orbit satellites have high throughput, low latency, steerable 20/30 GHz band beams that offer middle mile, broadband connections to last mile internet service providers as well as to private networks for enterprises, offshore industries and the U.S. government. O3b's

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[4] See http://www.hughesnet.com/index.cfm?page=Plans-Pricing; http://www.exede.com/internet-packages-pricing/service-availability?zip=20536.

[5] Jeffrey Hill, Hughes Drops Big News at SATELLITE 2013 with SSL Jupiter 2 Deal, Satellite Today, Mar. 21, 2013, http://www.satellitetoday.com/telecom/2013/03/21/hughes-drops-big-news-atsatellite-2013-with-ssl-jupiter-2-deal/.

[6] Peter B. de Selding, ViaSat-2's 'First of its Kind' Design Will Enable Broad Geographic Reach, May 17, 2013, http://spacenews.com/35369viasat-2s-first-of-its-kind-design-will-enable-broad-geographic-reach/#sthash.VeVmmVT9.dpufhttp://spacenews.com/35369viasat-2s-first-of-its-kind-design-will-enable-broad-geographic-reach/ .

service brings fiber-like speeds where fiber has not been, or cannot be deployed[7] – such as providing broadband connectivity that will follow a ship in motion. Beginning later this year, another non-geostationary satellite operator, Iridium, expects to launch its next-generation low-Earth orbit satellite constellation (Iridium NEXT), which promises to bring exceptional broadband capabilities to nearly any location in the world, and an affordable hosted payload platform supporting satellite-based innovation across a number of applications.

Satellite operators and satellite equipment manufacturers are also continuing to innovate while providing seamless communications and broadband services to many communications providers, government agencies, and consumers. New designs for smaller or flat panel antennas, led by manufacturers like Kymeta and AvL, are enabling ground-breaking satellite applications, like low-drag phased-array antennas for planes offering in-flight connectivity, in-motion antennas for avionics, auto-tracking satellite antennas that operate while a vehicle is moving, and flat thin satellite antennas that can replace large radomes on vessels. Together with satellite spot beam technologies, these innovations generate higher efficiencies and lower costs in 20/30 GHz band satellite service delivery. Much smaller antennas delivering higher bandwidths are expected to meet ever-expanding customer demand for delivery of broadband connectivity on high-speed trains, buses and other means of public transportation, and for passenger vehicles as well.[8] Spot-beam technology advances are boosting bandwidth availability and expanding markets for 20/30 GHz band satellite services. High capacity frequency re-use strategies rely on even smaller spot beams, which also boost gain to permit use of smaller ground antennas.[9] The range of market segments benefiting from 20/30 GHz band satellite service innovations continues to expand, from consumer broadband to avionics to oil and gas and beyond.[10]

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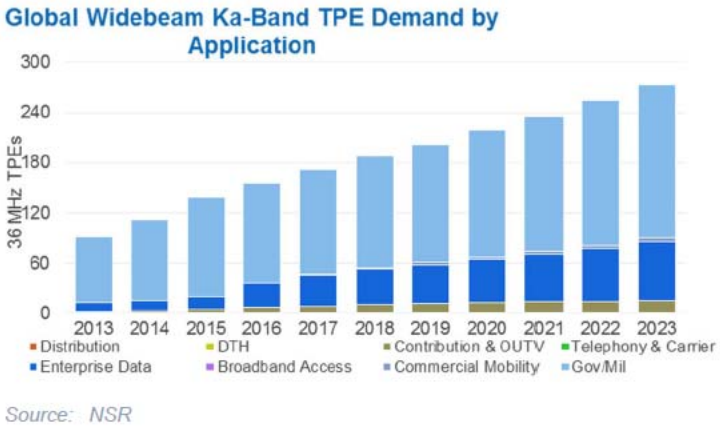
[7] For example, O3b's Hawaii gateway allows O3b to provide broadband connectivity to areas of the Pacific that lack access to fiber connections, including three Pacific island nations and to U.S. territory American Samoa.

[8] *See* Carol Patton, Innovations in Satellite Antennas Attracting New Markets & Opportunities, October 31, 2014, http://www.satellitetoday.com/publications/2014/10/31/innovations-in-satellite-antennas-attracting-new-markets-opportunities/; Peter B. de Selding, News from the High-Throughput Satellites London Roundtable Terminal Maker Sees Ka-band Sales Boom, December 9, 2013, http://spacenews.com/38559news-from-the-high-throughput-satellites-london-roundtable-terminal/; Winegard receives ViaSat approval for WV750A Ka-band VSAT system, October 30, 2014, http://www.oilcomm.com/press_release/winegard-receives-viasat-approval-wv750a-ka-band-vsat-system/.

[9] David Alexander, Intel: Interest In Spot Beam Capabilities Of Ka-Band Systems, January 2012 edition, http://www.milsatmagazine.com/story.php?number=1772881294.

[10] *See, e.g.,* Graham Warwick, Ka-Band Opens New Possibilities For Aircraft Connectivity (Broadband satellite communications bring new data connectivity options to aircraft), Apr 7, 2014, http://aviationweek.com/space/ka-band-opens-new-possibilities-aircraft-connectivity.

Commercial development of the frequencies above 24 GHz is not limited to the United States. In fact, most operators are engaged in international provision of services. For example, a significant number of commercial satellite operators around the world have launched 20/30 GHz band satellite systems, and additional systems are in development. Appendix 1, which is attached to these comments, shows both the existing and planned satellites in the 20/30 GHz band that are under construction.[11] The chart below shows projected demand for 20/30 GHz band wideband transponder equivalents through 2023. As the tables in Appendix 1 and the chart below demonstrate, the 20/30 GHz band is critical for HTS services worldwide.



Global Widebeam Ka-Band TPE & Demand by Application, 2013-2023 (Widebeam Ka demand in 36 MHz transponder equivalents (TPEs)) Northern Sky Research 2014

III. THE SATELLITE INDUSTRY HEAVILY USES THE IDENTIFIED SATELLITE BANDS TODAY AND WILL NEED THESE BANDS EVEN MORE TOMORROW.

SIA describes below the satellite industry's present and projected use of the Identified Satellite Bands.

A. 20/30 GHz Band Frequencies

1. The Middle LMDS Band (29.1-29.25 GHz)

Iridium uses the 29.1 to 29.25 GHz band for feeder links between its satellite constellation and multiple gateway earth stations. The feeder links are an essential component of Iridium's network, which provides voice and data coverage anywhere in the world. Commercial subscribers use Iridium for basic communications, smartphone access, and

[11] The data in Appendix 1 was compiled from information on satellite operator websites, third party consultant reports and analyst reports; it is not intended to be an exhaustive list. It is, however, indicative of the extensive investments which have been made in developing 20/30 GHz band satellite systems to date and the further substantial investments already committed or planned for new 20/30 GHz band satellite systems.

advanced machine-to-machine applications that facilitate economic activity in areas unserved by terrestrial networks. The U.S. government relies on Iridium for mission-critical military and intelligence communications and other national security needs, while first responders and relief workers use Iridium services to coordinate disaster response efforts in the United States and abroad. Feeder links in the 29.1-29.25 GHz band will also support Iridium NEXT, the company's second generation satellite constellation.

2. The Lower LMDS Band (27.5-28.35 GHz)

Today, the 20/30 GHz band is the principal band above 24 GHz that is used by the satellite industry to provide broadband services, DTH services, and MSS services. To support current and near term demand, both geostationary and non-geostationary satellite operators have had to expand into the 27.5-28.35 GHz segment ("Lower LMDS band"), in which the Fixed Satellite Service ("FSS") is currently a secondary allocation in the United States. ViaSat, Inmarsat Global Xpress and O3b currently use this spectrum to support their high throughput broadband satellites. In addition, Hughes has filed an application to add these bands to its Jupiter 2 (EchoStar XIX) broadband satellite.

B. 24 GHz Band (24.25-24.45 GHz and 25.05-25.25 GHz)

The 25.05-25.25 GHz portion of the 24 GHz band is part of the feeder link allocation for the 17/24 GHz BSS. This band was made available for satellite use in the United States relatively recently (service rules were adopted in 2007), and satellite demand for this spectrum was established as far back as 1997. DIRECTV was one of the first companies to be licensed to operate in this spectrum, and its just-launched DIRECTV-14 satellite includes a 17/24 GHz band payload that will be used to offer new UltraHD/4K television service to its more than 20 million subscribers. DIRECTV will be launching a second such satellite this year. DISH has proposed to use the 17/24 GHz BSS bands to feed video and other bandwidth-intensive content to terrestrial cell towers operating in lower frequency bands.

C. V-band (39 GHz and 37/42 GHz)

The 39.5-40 GHz and 37.5-38.6 GHz bands are allocated for non-Federal FSS gateway earth station downlinks, and for high density fixed services. The 42-42.5 GHz band is allocated for BSS downlinks to ubiquitous terminals, though radioastronomy in the upper adjacent band must be protected.

The FCC has invested significant time and effort, based on the need for additional satellite spectrum to support innovative services, to make the V-band available for satellite services, both domestically and internationally, and satellite manufacturers are developing

satellite components that can be used in the V-band. However, the Commission's 2010 Third Further NPRM dealing with sharing between FSS and FS in the 39 GHz and 37 GHz bands remains open,[12] as is its proposal to delete the BSS allocation from the 42-42.5 GHz band out of concern with the potential for interference into adjacent radioastronomy bands.[13] As 20/30 GHz band satellite spectrum becomes increasingly saturated in the near-term, V-band is the natural migration for expansion of both geostationary and non-geostationary satellite services.

D. 60 GHz and 70/80 GHz Bands

The 60 GHz band is used for inter-satellite cross-links given the poor atmospheric propagation characteristics in this band. The 70/80 GHz bands are lightly used but have great potential for satellite expansion. These bands may be particularly well-suited to a wide range of satellite uses, including public safety and U.S. government applications. SIA urges the Commission to preserve flexibility for future satellite access to these bands.

IV. THE COMMISSION SHOULD ENSURE THAT ADEQUATE SPECTRUM IS AVAILABLE FOR EXISTING AND FUTURE SATELLITE SPECTRUM REQUIREMENTS AS IT EXAMINES THE POSSIBLE PROVISION OF MOBILE RADIO SERVICES IN BANDS ABOVE 24 GHz.

The Commission recognizes in the NOI that "most of the candidate bands above 24 GHz are already shared and, most likely, will continue to be shared by other services,"[14] and thus concludes that it is important to ascertain the compatibility of the potential new terrestrial mobile service and these other services (which include various satellite services). SIA agrees that it is imperative for the Commission to consider the trade-offs in increased shared usage of spectrum and also ensure the compatibility of satellite services and any new terrestrial mobile services the Commission may consider authorizing.

In particular, SIA urges that the Commission carefully consider the impact that sharing requirements would have on the availability of spectrum for incumbent services, recognizing that shared use can have a direct impact on both current and future services provided in that band by existing users. Even a Commission proposal to allow sharing would affect the types of services available and the financing available for new and upgraded systems in existing services.

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[12] *In the Matter of 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*, Third Notice of Proposed Rulemaking, 25 FCC Rcd 15663, FCC 10-186 (rel. Nov. 1, 2010).

[13] *See id.*

[14] NOI, ¶ 46.

SIA urges the Commission to proceed judiciously in considering the potential for the provision of mobile radio services in bands above 24 GHz, and, in particular, the Identified Satellite Bands. Due consideration should be given to satellite's important and critical role as part of the U.S. and worldwide communications ecosystem. Since the Commission's consideration of these issues is at an early stage, it would be premature to make any decisions concerning licensing regimes for possible mobile services in the bands above 24 GHz.[15]

A comprehensive spectrum policy is required that takes into account the growth requirements and the need for innovation for all services – whether terrestrial or space-based. The FCC, therefore, should ensure that the satellite industry has access to sufficient spectrum to meet its current and future customer capacity and service demands, both in the bands in which it currently operates and in bands in which it has plans to operate to expand services.

CONCLUSION

In these comments, SIA has described the many innovative satellite services that are provided and are under development in bands above 24 GHz, including broadband and HDTV services that are relied upon by consumers, industry, relief organizations, and federal, state, and local governments. SIA has shown that spectrum certainty is essential for creating the conditions in which investment in satellite facilities and technologies will continue to thrive and satellites can remain responsive to customer demand. SIA urges the Commission to keep these satellite services and these factors in mind as it examines the potential for the provision of mobile radio services in bands above 24 GHz.

Respectfully submitted,

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January 15, 2015

[15] *See* NOI, ¶¶ 88-102.

APPENDIX 1

Table 1. Launched 20/30 GHz band Satellite Systems (68 Systems, 22 in the US)

Provider	Satellite Name	Provides US Coverage
ABS	ABS 2	No
ABS	ABS 7	No
Arabsat	Arabsat 5A	No
Arabsat	Arabsat 5C	No
Arabsat	Arabsat 6E	No
Arabsat	BADR-5	No
Avanti	Hylas 1	No
Avanti	Hylas 2	No
Avanti	Artemis	No
DBSD	D.1	Yes
DIRECTV	Spaceway 1	Yes
DIRECTV	Spaceway 2	Yes
Eutelsat	Eutelsat 3B	No
DIRECTV	DIRECTV 8	Yes
DIRECTV	DIRECTV 9S	Yes
DIRECTV	DIRECTV 10	Yes
DIRECTV	DIRECTV 11	Yes
DIRECTV	DIRECTV 12	Yes
DIRECTV	DIRECTV 14 (launched Dec 2014)	Yes
Eutelsat	Eutelsat 7A	No
Eutelsat	Eutelsat 7B (W3D)	No
Eutelsat	Eutelsat 16A (W3C)	No
Eutelsat	Eutelsat 25B	No
Eutelsat	Hot Bird 6/Eutelsat 8 West C	No
French Space Agency (CNES) & Italian Space Agency (ASI)	Athena-Fidus	No
Gazprom Space System	Yamal 601	No
Hispasat	Amazonas 3	Yes
Hispasat	Hispasat-1E	No
Hispasat	Spainsat	No
Hughes	Echostar 9	Yes
Hughes	Echostar 17/Jupiter 1	Yes
Hughes	Spaceway-3	Yes
Inmarsat	Inmarsat-5 F1	No
Inmarsat	Alphasat	No
ViaSat	Galaxy 28	Yes
Intelsat	Intelsat 20 (IAS 28)	No
Iridium	Iridium LEO (66 satellites)	Yes
ISRO	G-Sat 14	No
JAXA / NICT	Winds	No
JSAT	Superbird-B2	No

Measat	Measat-5	No
Ministry of Science and Technology of Venezuela	Venesat 1	No
NigComSat	NigComSat 1R	No
Nilesat	Nilesat 201	No
O3b Limited	O3b MEO (12 satellites)	Yes
RSCC	Express AM-5	No
SES	AMC-15	Yes
SES	AMC-16	Yes
SES	Astra-1H	No
SES	Astra-1L	No
SES	Astra-2E	No
SES	Astra-2F	No
SES	Astra-2G	No
SES	Astra-3B	No
SES	Astra-5B	No
SES	Sirius 4 (Astra-4A)	No
SpaceCom	Amos 3	Yes
SpaceCom	Amos 4	No
Telesat	Anik F2	Yes
Telesat	Anik F3	Yes
Telesat	Nimiq 4	Yes
Turksat	Turksat 4A	No
Turksat	Turksat 4B	No
ViaSat	ViaSat-1	No
ViaSat	Wildblue-1	No
Yahsat	Yahsat 1A	No
Yahsat	Yahsat 1B	No
Yahsat	Al Yah 3	No

Table 2. To-Be-Launched 20/30 GHz band Satellite Systems (34 Systems, 7 in the US)

Provider/Operational Date	Satellite Name	To Provide US Coverage
Arabsat (2015)	BADR-7	No
Avanti (2016)	Hylas 3	No
Avanti (2017)	Hylas 4	No
ChinaSat (2017)	ChinaSat 16	No
DIRECTV	DIRECTV 15	Yes
Eutelsat (2015)	Eutelsat 36C	No
Eutelsat (2016)	Eutelsat 65 West A	No
HisdeSAT (TBA)	HisNorSat	No
Hispasat (TBA)	Amazonas 5	No
Hispasat (2015)	Hispasat AG1	No
Hispasat (2016)	Hispasat 1F	No
Hughes (2016)	Echostar 19/Jupiter 2	Yes
Inmarsat & Hellas (TBA)	EuropaSat/Hellas Sat 3	No
Inmarsat (2015 & 2016)	Inmarsat-5 F2, F3 & F4	Yes
Insat (2016)	GSat 11	No
Intelsat (2015 & 2016)	Epic (2 satellites)	Yes
JSAT (2016)	JCSat 16	No
JSAT (2015)	Superbird 8	No
KT Sat (TBA)	Koreasat-7	No
NBN Co. (2015)	NBN-1	No
NBN Co. (2015)	NBN-2	No
NewSat (2016)	Jabiru 1	No
NewSat (TBA)	Jabiru 3	No
NewSat (TBA)	Jabiru 4	TBA
NewSat (TBA)	Jabiru 5	Yes
RSCC (2015)	Express AM6	No
SES (2017)	SES-12	No
Solaris Mobile	EchoStar XXI	No
Spacecom (2015)	Amos 6	No
Star One (2016)	Star One D1	No
Telebras (2016)	Telebras Ka (SGDC-1)	No
Telenor (2015)	Thor-7	No
ViaSat (2016)	ViaSat-2	Yes