

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Actions to Accelerate Adoption and Accessibility of Broadband-enabled Health Care Solutions and Advanced Technologies	)	GN Docket 16-46
	)	
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 37.5-40.0 GHz Bands	)	IB Docket No. 15-256
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	

**REPLY COMMENTS OF THE SATELLITE INDUSTRY ASSOCIATION**

The Satellite Industry Association<sup>1</sup> (SIA) submits these reply comments in the Commission’s above-captioned public notice regarding broadband-enabled health care solutions.

**I. INTRODUCTION AND SUMMARY**

The record in this proceeding demonstrates the substantial societal value of broadband-enabled health care solutions. Because of their unique capacity for ubiquitous, reliable, and high bandwidth broadband connectivity, satellite communications are and will remain essential to

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<sup>1</sup> 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; DataPath, Inc; DigitalGlobe 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. For more information on SIA, see [www.sia.org](http://www.sia.org).

telehealth applications. Satellite communications support a wide range of broadband enabled health services in the United States and around the world, including services delivering health care in hospitals, at homes, in challenging or remote environments, and in the wake of disasters when other communications platforms have been crippled. As the Commission makes policy decisions in these and other proceedings, it should bear in mind the critical role of satellite communications in delivering these life-saving services.

## **II. SATELLITE BROADBAND IS A KEY ENABLER OF TELEHEALTH SOLUTIONS**

Comments filed in response to the public notice provide evidence that broadband-enabled health services are key to improving quality of life for all Americans, whether in the most populous urban areas, remote rural communities, or anywhere in between. Commenters offered a wide range of digital health or telehealth applications.

- Nokia submitted a report of a working group of the Broadband Commission for Sustainable Development that identifies examples of digital health including “connecting remote, rural and underserved communities with referral centers and expert care, training healthcare providers (e.g., by eLearning and mLearning), improving quality of care through digital solutions for diagnosis, clinical decision support systems, supportive supervision or monitoring patient compliance with treatment, optimizing resource allocation and lowering healthcare costs through more efficient care coordination (e.g., with electronic medical records), improving data management for surveillance, reporting, accountability and monitoring, and facilitating communications between health workers, specialists and patients.”<sup>2</sup>
- The American Telemedicine Association identified a different list of “the leading remote health services in common use today,” including: Teleradiology, Remote cardiac and other diagnostic monitoring, Neurophysiologic monitoring, Consumers receiving a direct consult from independent, video-based and/or audio-based online health sites, Remote intensivist services for ICUs, Remote telemental health consultations, Multi-purpose clinical services provided through

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<sup>2</sup> Broadband Commission for Sustainable Development, *Digital Health: A Call for Government Leadership and Cooperation between ICT and Health 4* (February 2017) attached to Comments of Nokia, GN Docket No. 16-46 (filed May 24, 2017).

institutional networks, Remote patient monitoring for chronic diseases, Remote neurology services for stroke, Remote patient care at walk-in clinics.”<sup>3</sup>

- The National Public Safety Telecommunications Council (“NPSTC”) submitted information addressing Emergency Medical Services (“EMS”) use of telemedicine applications. As NPSTC explains, EMS often serves as an integral life-saving link with a hospital during the time a patient is cared for in the field and then transported to an emergency department.<sup>4</sup> EMS telemedicine applications can include: “Sending of video or pictures of patients, scene environment (e.g., crashed vehicle, home setting), specific injuries, or other physical assessment signs; Two-way conferencing among field providers, patients, and medical control or consulting staff, Sending of diagnostic still or video images (e.g., ultrasound, eye/ear/nose/throat scopes), electronic stethoscope sounds, and multi-vital sign monitoring devices); and Remotely monitoring, and perhaps adjusting, home or other remote patient diagnostic and treatment devices.”<sup>5</sup>

Although these broadband-enabled health applications are diverse, they are unified by the fact that, regardless of where they are provided, whether at home, in a medical facility, or out in the field, telehealth solutions always depend upon a reliable and secure broadband connection of sufficient speed and capacity to support the services. However, different applications will have different broadband demands. Supporting the wide range of broadband-enabled solutions at use in a given hospital might require substantial instantaneous capacity. A first responder or disaster relief worker providing emergency medical services out in the field may have less capacity demand on an individual basis, but a critical need for reliable mobile connectivity. Notably, few contemporary telehealth solutions are highly-latency sensitive, and while there may be some future applications requiring near-zero latency, these will be the exception rather than the rule for

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<sup>3</sup> Comments of American Telemedicine Association at 2-4, GN Docket No. 16-46 (filed May 24, 2017).

<sup>4</sup> Comments of National Public Safety Telecommunications Council at 4-5, GN Docket No. 16-46 (filed May 24, 2017).

<sup>5</sup> National Public Safety Telecommunications Council, *EMS Telemedicine Report 1* (Feb. 24, 2016) attached to Comments of National Public Safety Telecommunications Council, GN Docket No. 16-46 (filed May 24, 2017).

broadband-enabled health services. Importantly, however, any health-related service must have stable underlying connectivity of the highest resiliency and security.

The satellite broadband services of today and tomorrow are critical to realizing the full potential of broadband-enabled health applications and each of the telehealth solutions cited above are enabled today by satellite connectivity. Satellite services clearly have all the necessary characteristics to support telehealth applications, with sufficient capability and performance to be the primary option for connectivity as a direct competitor with other platforms, as well as stable, always-on connectivity necessary for safety of life and mission-critical backup operations.

Satellite broadband systems offer global coverage, able to provide ubiquitous service in the most populous urban regions as well as the most rural and remote communities, and even Americans abroad. Satellite broadband provides enhanced network resiliency, given that the vast majority of the infrastructure is located between 435-23,600 miles above the earth, making it especially reliable in times of natural and manmade disasters. And with high throughput geostationary earth orbit (GEO) systems, lower latency medium earth orbit (MEO) systems, and current and future low earth orbit (LEO) systems, the satellite industry offers the versatility and diversity to meet any demand, whether the priority is high capacity, reliable mobility, low latency, or all of the above. Upcoming systems will only improve upon this versatility with even higher performance constellations in the works.

### **III. SATELLITE OPERATORS SUPPORT DIVERSE TELEHEALTH SOLUTIONS.**

The satellite industry already supports a wide range of telehealth solutions in various environments around the United States and the world, and satellite operators have plans to continue innovating and expanding their offerings in this space. Various commenters noted ways satellite communications enable innovative health services. Tanana Chiefs Conference noted that satellite-enabled telemedicine has allowed them “to dramatically improve access to

care, accelerate diagnosis and treatment, avoid unnecessary medivacs and expand local treatment options” in 30 communities.<sup>6</sup> Tanana Chiefs Conference says that connectivity enables its doctors to manage patient records in real time, which “has greatly improved medication management, reduced hospital re-admittance, increased patient safety and brings a sense of security for all who manage the patients' care.”<sup>7</sup> In a White Paper on “Enabling Healthcare Connectivity in the United States through Satellite Broadband,” SIA member, Hughes, demonstrated how satellite networks facilitate access to broadband-enabled healthcare solutions throughout the United States through ubiquitous, cost-efficient, reliable coverage. The Hughes White Paper highlighted services satellite operators are uniquely well-suited to deliver to healthcare providers, including managed cloud access, electronic records sharing, patient portal management, billing and compliance, in hospitals and services in support of senior care, such as remote monitoring, early detection screenings, and video conferencing doctor’s appointments.<sup>8</sup>

SIA’s members are proud to deliver services supporting diverse health applications in the United States. For example, ViaSat, has supported telehealth proof of concept programs focused on veterans in rural areas. The first concept, covering rural Louisiana, Arkansas, and Texas is designed to connect widely dispersed veterans to the telemedical services that they need. For example, in Louisiana, the Volunteers of America (VoA) began the Rural Vets Outreach program.<sup>9</sup> Another supports veterans with mental health issues, like post-traumatic stress

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<sup>6</sup> Comments of Tanana Chiefs Conference at 1, GN Docket No. 16-46 (filed May 24, 2017).

<sup>7</sup> *Id.*

<sup>8</sup> Hughes, *Enabling Healthcare Connectivity in the United States through Satellite Broadband* 4-5 (May 2017), *attached to* Letter from Jennifer A. Manner, Senior Vice President, Regulatory Affairs, Hughes Network Systems, LLC to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 16-46 (filed May 24, 2017).

<sup>9</sup> ViaSat, Inc., Veterans in Rural Areas Get Connected to VA Services with New Tele Mental Health Service, <https://www.viasat.com/news/veterans-rural-areas-get-connected-va-services-new-tele-mental-health-service> (last visited June 4, 2017).

disorder (PTSD)<sup>10</sup> through satellite broadband technology allowing use of Clinical Video Telehealth (CVT) for home appointments for direct connection with doctors. The programs, combined with high-speed data connections, can bring treatments to veterans in their homes, reducing barriers to obtaining services.

Beyond connecting Americans at home with their healthcare providers, SIA's members enable critical and life-saving health applications globally, including supporting our troops abroad and relief organizations that rely on American aid workers. Mobile and portable satellite communications are often the only connectivity options available in the critical hours and days immediately after a major disaster. While ground-based terrestrial facilities might be incapacitated for any number of reasons, relief, public safety, and military personnel rely upon satellite communications to save lives and re-establish order. This includes emergency medical services workers, who use mobile and portable satellite connectivity to help organize their response, collect and disseminate information about affected populations, and establish connectivity and temporary clinics.

Due to their ubiquity, resiliency, and versatility, satellite communications often are key to delivering telehealth, telemedicine and e-health applications to remote communities around the world. As the only joint MEO and GEO satellite operator in the world,<sup>11</sup> SES and O3b use satellite technologies and services to provide these solutions in difficult to reach areas with limited internet access. O3b successfully provided its MEO satellite connectivity with the USS

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<sup>10</sup> The Rural Connection, Office of Rural Connection, Veterans Affairs Administration, "Connecting Mississippi's Rural Veterans to Mental Health Care via Telehealth," [https://www.ruralhealth.va.gov/docs/news/ORH\\_Newsletter\\_Fall2016\\_FINAL.pdf](https://www.ruralhealth.va.gov/docs/news/ORH_Newsletter_Fall2016_FINAL.pdf).

<sup>11</sup> SES S.A., *SES Acquisition of O3b to Deliver Transformational Satellite Connectivity to the U.S. Government*, (August 19, 2016), <https://www.ses.com/blog/ses-acquisition-o3b-deliver-transformational-satellite-connectivity-us-government>. SES S.A., the largest communications satellite operator in the world, completed acquisition of O3b Networks on August 1, 2016).

Fort Worth combat ship for a short-term operation.<sup>12</sup> During the operation, a crewman became ill while the ship was traversing the Pacific Ocean. The USS Fort Worth contacted doctors on shore who were able to evaluate and treat the patient using a real-time video conference application via O3b's high throughput, low latency connection.

SES's new government product, the Rapid Response Vehicle (RRV), is the world's first mobile platform to offer collaborative communications technologies over multiple orbits and frequencies, including Ku-, Ka-, and Military X- and Ka-bands, across SES's GEO fleet and fiber-like Ka-band delivered over O3b's MEO constellation. This versatility enables the RRV to provide high-speed connectivity and global communications services tailored to a broad range of commercial, civil, humanitarian and defense missions around the world.<sup>13</sup> The RRV can deploy to areas lacking sufficient connectivity and quickly launch SATMED telemedicine service.

Satellite operators often partner with international organizations, non-profit groups, or government programs to deliver telehealth services to populations in need. SES has collaborated with the Luxembourg government to develop SATMED, an IT enabled cloud infrastructure providing fast and reliable connectivity around the globe which also facilitates data exchanges between professionals and medical frameworks.<sup>14</sup> The first deployment of SATMED in Benin provided a remote consultation and monitoring tool to establish effective childbirth healthcare

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<sup>12</sup> O3b Limited, *O3b Network Successfully Participates in U.S. 7<sup>th</sup> Fleet Trident Warrior Exercises*, (June 22, 2015), <http://www.o3bnetworks.com/o3b-networks-successfully-participates-in-u-s-7th-fleet-trident-warrior-2015-exercises/>.

<sup>13</sup> SES S.A., *Rapid Response Vehicle - for Defence, Security and Humanitarian Missions*, (April 19, 2017), <https://www.ses.com/newsroom/rapid-response-vehicle-defence-security-and-humanitarian-missions>.

<sup>14</sup> SES S.A., *SES Partners for E-Medicine Platform SATMED*, (May 27, 2014), <https://www.satmed.com/news-2014-05-27.php>.

communications between a maternity hospital and two other hospitals in the region.<sup>15</sup> In Benin, this platform provides the only effective communication link between the three units, since the routes are often inaccessible due to flooding during the rainy season. SATMED has since expanded to provide services to other developing countries in Africa and Asia.

Another initiative launched in Benin used Inmarsat's mobile satellite service ("MSS") connectivity to bring remote healthcare for the benefit of over 1300 children and their families. Charity SOS Children's Villages Benin worked with clinics in the Abomey and Dassa-Zoumé regions, gathering patients' medical information on smart tablets, and sending it in real time via satellite mobile broadband data service to a secure server allowing urban doctors to monitor and evaluate the villagers' health and to bring medical attention to individuals sooner than otherwise would be possible.

Currently, Inmarsat is partnering with InStrat Global Health Solutions and others, with some funding from the UK Space Agency, on a project bringing training videos and medical service applications to medical workers in Nigeria. The training focuses on maternal, newborn, and child health, and provides access to vital information that can save lives. Using Inmarsat's mobile satellite broadband services allows this important content to be delivered directly to medical workers on the front lines in remote communities that would have no other way to access this information. The Inmarsat BGAN technology being deployed in communities to deliver this training also will support additional information system applications, such as health database management, identity registration, and insurance claim tracking, improving disease surveillance capabilities and improving health.

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<sup>15</sup> SES S.A., *Health Platform in Benin to Improve Treatment of Infectious Tropical Disease*, (June 4, 2015), <https://www.satmed.com/news-2015-06-04.php>



Satellite systems are also essential in the wake of natural and manmade disasters to restore connectivity that supports health as well as other relief efforts when other communications means are damaged or not available. For many years, Iridium has worked with the International Telecommunication Union providing assistance to the ITU emergency relief teams deployed around the world in the areas where natural disaster strikes, donating satellite phones to provide critical communications during recovery efforts. To mention a few—Iridium phones were used by the ITU emergency relief teams during the Asian tsunami in 2004, Pakistani earthquake in 2005, Zimbabwe floods in 2009, Haitian earthquake in 2010, Japanese earthquake in 2011, Hurricane Sandy in 2012, and the Ecuadorean earthquake of 2015.

Inmarsat also partners closely with relief organizations, including over 15 years of partnership with Télécoms Sans Frontières (TSF), and support for Médecins du Monde (MdM) and Médecins Sans Frontières. Inmarsat services support relief efforts in the immediate aftermath of every major disaster in recent memory, including the 2014 Typhoon Hagupit that struck the Philippines, 2015's Tropical Cyclone Pam that roared across Vanuatu, and 2015's Hurricane Matthew that pounded Haiti. Satellite communications remain essential even after the initial response efforts have completed. In Nepal, for example, TSF working in collaboration with Médecins du Monde (MdM), put in place a mobile data collection system utilizing Inmarsat's connectivity to allow medical professionals to accelerate the detection of disease outbreaks at field level. This system, which equipped medics with a smartphone-based data collection application and supported daily reporting from remote locations via Inmarsat BGAN

communications service remained active many months after the 2015 earthquake in that country.<sup>16</sup>

#### **IV. POLICY RECOMMENDATIONS TO PROMOTE SATELLITE-ENABLED HEALTH APPLICATIONS**

The examples noted above highlight the role that satellites are currently playing in delivering broadband-based health services into hard-to-reach areas. Moreover, future satellite systems will have increased speeds, greater capacities, and lower latencies, making them ideally suited for telehealth as part of 5G connectivity. To achieve the full potential of satellite broadband connectivity and the telehealth benefits derived from these services, the Commission needs to ensure sufficient spectrum is allocated for satellites, individually-licensed satellite earth stations, and user terminals. Further, the Commission should pursue a balanced approach to making additional spectrum available for future growth.

In addition to ensuring adequate spectrum availability for both satellite broadband end user terminals and connected gateway operations, the Commission should also reduce regulatory barriers to facilitate deployment of satellite broadband earth stations supporting broadband-enabled health solutions. In order to deliver on the broadband-enabled health future, satellite systems will require both satellite user terminals and gateways. Satellite earth stations will need to be deployed at hospitals, clinics, homes, disaster sites, and elsewhere to support telehealth operations. Additionally, high throughput satellite broadband systems have extremely large system capacity due to efficient spectral reuse and require the ability to connect to enterprise-level broadband facilities. As the Commission crafts rules for current and future satellite

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<sup>16</sup> Inmarsat, *Inmarsat enables emergency mHealth in Nepal*, <http://www.inmarsat.com/news/inmarsat-enables-emergency-mhealth-in-nepal/> (Aug. 6, 2015).

services, it should avoid unnecessarily onerous regulatory restrictions on earth stations that might limit broadband connectivity choice for health care providers and patients.

Several commenters remarked on the importance of the Commission's Rural Health Care Program in promoting availability and adoption of broadband-enabled health solutions.<sup>17</sup> As commenters correctly note, the Rural Healthcare Program is "making a significant difference in the ability and capacity of healthcare providers to serve the needs of and underserved rural communities,"<sup>18</sup> but modifications or expansions to the program could increase its benefits. As the Commission considers improvements to this and other Universal Service Fund (USF) programs, it should bear in mind the key role of satellite broadband connectivity in achieving its public interest goals, and ensure that satellite broadband services are capable of competing for access to USF funding.

Finally, SIA calls upon the Commission to ensure any decisions taken related to broadband services are technology neutral in nature and that any workshops, consultations, or other processes designed to advance telehealth services include all stakeholders, including the satellite community. As we build a more connected society, one that ensures health care is smarter, faster, and more readily available, it is important to not tip the scale in favor of one technology over another. To do so would limit choice and increase gaps in coverage.

## **V. CONCLUSION**

The record compiled in this proceeding illustrates the growing importance of telehealth services in promoting quality of life across the United States. SIA's membership is proud of the critical role that satellite communications play today and will continue to play tomorrow as a key

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<sup>17</sup> *See, e.g.*, Comments of Tanana Chiefs Conference; Comments of Kenaitze Indian Tribe; Joint Comments of Parkview Health and Franciscan Alliance.

<sup>18</sup> Joint Comments of Parkview Health and Franciscan Alliance at 1.

enabler of these services. As the Commission considers further policy activities to promote the development broadband-enabled health services, SIA urges it to bear in mind that robust satellite communications are essential to achieving this goal.

Respectfully submitted,

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