

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

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90

**COMMENTS OF SES AMERICOM, INC. AND O3B LIMITED**

SES Americom, Inc. and its affiliate O3b Limited (together, “SES”) welcome the opportunity to submit these comments in response to the Federal Communications Commission’s (“the Commission”) above-captioned Notice of Proposed Rulemaking, which seeks comment on how best to continue the work of the Connect America Fund (“CAF”) Phase II auction and establish a better support system for areas that lack access to critical broadband service.<sup>1</sup>

SES, one of the world’s largest commercial communications satellite operators, is the only company with commercial operations using both geostationary orbit (“GSO”) and non-geostationary orbit (“NGSO”) satellite fleets. SES entities operate more than 50 GSO satellites able to reach 99% of the world’s population, many of them pursuant to Commission authority. Through its wholly-owned subsidiary, O3b, SES also operates a global broadband satellite system of sixteen Ka-band NGSO satellites in Medium Earth Orbit (“MEO”) that makes high-speed, low-latency broadband connectivity available around the globe, including in areas where terrestrial network coverage is limited or non-existent. O3b does not directly serve consumers or end users; instead, it offers middle-mile capacity to telecommunications carriers that use O3b’s satellite

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<sup>1</sup> *Rural Digital Opportunity Fund, Connect America Fund*, Notice of Proposed Rulemaking, WC Docket Nos. 19-126 & 10-90, FCC 19-77 (rel. Aug. 2, 2019) (“NPRM”).

capacity to deliver service to end users. It is these telecommunications carriers that will leverage SES's capacity to provide much-needed connectivity to all Americans.

As the Commission considers additional ways in which to extend service to the millions of U.S. households and small businesses that remain unconnected,<sup>2</sup> it should adopt technology-neutral standards that enable Rural Digital Opportunity Fund ("RDOF") applicants to integrate cost-effective satellite broadband technologies into their networks, including SES's GSO and low-latency NGSO connectivity. This NPRM is a new opportunity for the Commission to ensure that the cost-effectiveness of rural broadband connectivity is maximized by considering the contributions that can be made by next-generation satellite constellations, while maintaining criteria that are consistent with decisions of international standards bodies and with consumer expectations for real-time services.

#### **I. THE NPRM'S PROPOSED LATENCY METRICS DO NOT REFLECT THE ADVANCED CAPABILITIES OF SATELLITE NETWORKS**

Since 2013, the Commission has repeatedly chosen 100 milliseconds ("ms") as the threshold for low latency.<sup>3</sup> In this NPRM, the Commission again proposes to rely on the 100 ms latency standard that it adopted in its previous Connect America Fund auction decision.<sup>4</sup> The Commission's proposed latency metrics fail to consider the actual network requirements for broadband services and could thwart the significant contributions existing and next-generation satellite technologies can make to expand U.S. citizens' broadband access. The Commission's choice of an arbitrary latency baseline instead of a pragmatic one would unfairly penalize satellite

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<sup>2</sup> See *id.* at ¶ 3.

<sup>3</sup> See *id.* at ¶ 23; see also *Connect America Fund*, Report and Order, 28 FCC Rcd 15060 (WCB 2013) ("CAF Phase II Price Cap Service Obligation Order") at 15060, ¶ 2.

<sup>4</sup> See *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949, 5960, ¶ 29 (2016).

operators that currently deliver broadband connectivity and support real-time applications.

SES's unique, multi-orbit system delivers high-speed data services to a variety of customers. For example, SES's O3b MEO NGSO network delivers fiber-like connectivity to enterprise, government, and mobility customers in the most remote, hard-to-reach locations. With round-trip latency in the range of 120-150 ms, O3b is able to support 4G/LTE services and meet customer expectations for typical broadband applications.<sup>5</sup> For instance, in 2017 SES used its MEO constellation's advanced spot beam capabilities in conjunction with Amazon's Project Loon to restore 4G/LTE services to Puerto Rico following hurricane Maria.<sup>6</sup>

SES enables high-speed broadband services through its GSO satellite network across the U.S., serving customers in New York, Maryland, North Carolina, Oklahoma, California, and Alaska. For example, since 2017, SES has partnered with OptimERA to provide GSO C-band capacity to deliver internet connectivity to Unalaska, Alaska.<sup>7</sup> Many critical broadband-enabled applications are not latency-sensitive, such as video streaming, web browsing, social media, and email, which makes GSO connectivity an important option for supporting broadband service, particularly in rural and hard to reach locations.

SES's high-throughput satellite ("HTS") GSO spacecraft combine with the O3b MEO fleet to create the industry's only multi-orbit, multi-band services. With fiber optic speeds and ubiquitous reach, SES can deliver the same services as terrestrial networks, but to locations that

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<sup>5</sup> See O3b, *What is latency and Why Does it Matter*, <https://www.ses.com/blog/what-latency-and-why-does-it-matter> (Feb. 28, 2017).

<sup>6</sup> See SES Networks *Works with Project Loon to Restore Connectivity in Puerto Rico*, <https://www.ses.com/press-release/ses-networks-works-project-loon-restore-connectivity-puerto-rico>; see also SES Networks, *Delivering 4G/LTE Services*, <https://www.ses.com/case-study/delivering-4glte-services> (May 6, 2019).

<sup>7</sup> See, e.g., SES Networks, *Connecting Underserved Regions Case Study*, <https://www.ses.com/case-study/unalaska> (Nov. 29, 2017).

terrestrial networks are unable to reach. For instance, SES recently announced that it will use its multi-orbit satellite system in a partnership with Microsoft Azure to provide private, cloud-scale satellite connectivity from any vessel, airplane, enterprise, energy, or government site in the world.<sup>8</sup> The ubiquitous service that SES's multi-platform satellite network provides is critical for partners such as government, business and ISPs to deliver global connectivity, and could be used to bring new levels of connectivity to rural America. Once the traffic is landed, SES can work with its ISP customers to ensure capacity is efficiently delivered to end users over SES's heterogeneous satellite network and that modern network tools like cloud services and real time communications applications proliferate.

## **II. THE COMMISSION SHOULD NOT IMPOSE ARBITRARY LATENCY STANDARDS THAT DISCOURAGE RDOF APPLICANTS' USE OF SATELLITE SOLUTIONS**

The latency benchmarks proposed in the NPRM are arbitrary and would unjustly penalize satellite operators that provide the same services as terrestrial operators, with no perceivable difference in customers' experiences. Given the importance of expanding broadband access to rural America, the Commission should facilitate all available and effective methods of delivering rural broadband to the U.S. public. If the Commission decides to establish a latency benchmark, it should rely on industry-accepted standards, such as the range that the International Telecommunication Union ("ITU") has recognized as providing high user ratings for real-time applications.<sup>9</sup>

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<sup>8</sup> SES Extends Global Reach of Microsoft Azure ExpressRoute with Multi-orbit Satellite Systems, <https://www.ses.com/press-release/ses-extends-global-reach-microsoft-azure-expressroute-multi-orbit-satellite-systems> (Sept. 9, 2019).

<sup>9</sup> See ITU-T, "International telephone connections and circuits – General Recommendations on the transmission quality for an entire international telephone connection," Recommendation G.114, <https://www.itu.int/rec/T-REC-G.114-200305-I/en>, May 2003 ("Recommendation G.114").

Although the Commission's foundational requirement for Connect America Fund recipients is to provide "sufficiently low latency to enable use of real-time applications, such as VoIP,"<sup>10</sup> the Commission established the 100 ms latency standard based only on a survey of wireline network capabilities, without considering the latency actually needed for real-time applications.<sup>11</sup> Further, an ITU study referenced by the Commission<sup>12</sup> contradicted the establishment of a 100 ms benchmark, as it demonstrated that user satisfaction levels were at or above 90 percent with no significant drop-off for voice calls with a latency up to 200 ms.<sup>13</sup> The Commission, however, dismissed concerns that the 100 ms standard would exclude satellite providers by citing a single set of comments, summarizing those comments as "criticizing satellite latency that cannot be improved by increased data speeds."<sup>14</sup> Nowhere in the decision did the Commission address whether the latency standard adopted was in fact necessary to enable use of VoIP or other real-time applications. Nor did the Commission consider the capabilities of NGSO satellite networks, many of which were yet to be planned or deployed in 2011.

In this NPRM, the Commission proposes yet again to rely on the 100 ms latency standard that it adopted in previous Connect America Fund orders<sup>15</sup> without assessing whether 100 ms is

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<sup>10</sup> See *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17698, ¶ 96 (2011) ("CAF First R&O").

<sup>11</sup> *Id.* at 17698, ¶ 96 & n.146.

<sup>12</sup> *Id.* at 17698, ¶ 96 n. 145, *citing* Recommendation G.114.

<sup>13</sup> Recommendation G.114 at 3, Figure 1/G.114.

<sup>14</sup> CAF First R&O, 26 FCC Rcd at 17698, ¶ 96 n.146, *citing* Letter from John Kuykendall, on behalf of BEK Communications, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 *et al.*, Attach. at 15 (filed Oct. 6, 2011).

<sup>15</sup> See, e.g., *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 5949, 5960, ¶ 29 (2016).

required for real-time applications. Indeed, contrary to the FCC’s established 100 ms latency benchmark, 3GPP and ETSI standards have consistently placed the acceptable latency range for most real-time applications, including voice and video calling, at 150-400 ms.<sup>16</sup> As discussed above, the ITU’s latency specifications in Recommendation G.114 cited by the Commission are also significantly more relaxed than the 100 ms standard. Thus, the 100 ms latency metric proposed in the NPRM fails to reflect the actual requirements of real-time applications and therefore is not consistent with the standard of ensuring that consumers in rural America receive reasonably comparable service.

Time and time again, SES and other satellite operators have demonstrated that satellite networks can successfully deliver broadband that can support real-time applications.<sup>17</sup> More recently, SES has obtained a MEF Carrier Ethernet 2.0 (CE 2.0) certification, demonstrating its capability to deliver the most advanced, high-performance, and secure Ethernet services globally, ensuring that SES customers will have fiber-equivalent connectivity that “consistently

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<sup>16</sup> See, e.g., ETSI TS 122 105 V12.1.0 (2015-01), [https://www.etsi.org/deliver/etsi\\_ts/122100\\_122199/122105/12.01.00\\_60/ts\\_122105v120100p.pdf](https://www.etsi.org/deliver/etsi_ts/122100_122199/122105/12.01.00_60/ts_122105v120100p.pdf) at 28-30 (specifying performance requirements for real-time conversation with an acceptable range up to 400 ms); 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects Service aspects; Services and service capabilities (Release 9), 3GPP TS 22.105 V9.1.0 (2010-09), [https://arib.or.jp/english/html/overview/doc/STD-T63v10\\_10/5\\_Appendix/Rel9/22/22105-910.pdf](https://arib.or.jp/english/html/overview/doc/STD-T63v10_10/5_Appendix/Rel9/22/22105-910.pdf) at 28-29 (same).

<sup>17</sup> See generally *PR/USVI Fund*, Comments of SES S.A. and O3b Limited, Docket Nos. 18-143, 10-90, and 14-58 (filed Jan. 26, 2018); see also *Public Safety and Homeland Security Bureau Seeks Comment on Response Efforts Undertaken during 2017 Hurricane Season*, Comments of SES S.A. and O3b Limited, PS Docket No. 17-344 (filed Jan. 22, 2018); see *Promoting Telehealth for Low-Income Consumers*, Comments of SES Americom, Inc. and O3b Limited, Docket No. 18-213 (filed Sept. 10, 2018) at 1-2; *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, Comments of SES Americom and O3b Limited, Docket No. 18-238 (filed Sept. 17, 2018) at 2.

delivers an unrivalled, ubiquitous quality of digital experience even in the most remote areas on the planet.”<sup>18</sup>

Defining low latency as 100 ms or less would be unjustified and would impede RDOF applicants’ ability to serve rural areas with high-performance broadband using satellite connectivity services. The draft *Uniendo a Puerto Rico and Connect USVI Fund* (“PR/USVI Fund”) Order to be considered at this month’s Commission meeting acknowledges the importance of encouraging participation by satellite providers, noting that varying degrees of latency should be taken into account when weighting service performance.<sup>19</sup> Despite this, the proposals in the NPRM would penalize satellite operators by characterizing bidders offering anything above 100 ms of latency as “high latency.”<sup>20</sup>

The Commission should base its latency threshold on real-world needs for advanced telecommunications applications and, therefore, should adjust the proposed latency benchmark to reflect the actual requirements of broadband network applications. This modification to the proposed metrics will ensure that the Commission does not undermine the reach of quality broadband service by imposing an artificial threshold that ignores the ability of systems with latencies higher than 100 ms to provide real-time broadband applications. Further, adopting a benchmark consistent with the established latency values adopted by international standards

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<sup>18</sup> SES Networks, *How MEF Certification of Satellite-based Service Makes Fibre Quality Connectivity Ubiquitous Worldwide*, <https://www.ses.com/blog/how-mef-certification-satellite-based-service-makes-fibre-quality-connectivity-ubiquitous> (Nov. 22, 2017); *see also* SES Networks, *SES Networks First to Achieve MEF CE 2.0 Services Certification Over Satellite*, <https://www.ses.com/press-release/ses-networks-first-achieve-mef-ce-20-services-certification-over-satellite> (Nov. 7, 2017).

<sup>19</sup> *The Uniendo a Puerto Rico Fund and the Connect USVI Fund*, Draft Report and Order and Order on Reconsideration, WC Docket Nos. 18-143, 10-90, and 14-58 (rel. Sept. 5, 2019) at ¶ 26.

<sup>20</sup> *See* NPRM at ¶ 23.

organizations will enable RDOF applicants to take advantage of the full range of connectivity options, including satellite networks, and to support broadband expansion in hard-to-serve rural areas.

### **III. CONCLUSION**

Enabling the inclusion of satellite connectivity in the RDOF would empower applicants to bring service to the most rural areas of the United States. SES urges the Commission to adopt technology-neutral standards without arbitrary latency requirements to ensure that RDOF applicants have the option to integrate cost-effective and high-performance satellite broadband technologies into their networks.

Respectfully submitted,

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