

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

*In the Matter of*

**2020 COMMUNICATIONS MARKETPLACE REPORT**

GN Docket No. 20-60

**COMMENTS OF SPACE EXPLORATION HOLDINGS, LLC**

Space Exploration Holdings, LLC (“SpaceX”) files these comments in response to the Commission’s request for input on the state of competition in the communications marketplace for its biennial report to Congress.<sup>1</sup> The Commission has long recognized the critical role that satellites play in the nation’s communications landscape. “Satellite technology is used to provide communication services throughout the United States and the world and is particularly important for communication in remote areas that are unserved or underserved by terrestrial communication facilities. Satellites also provide connectivity for first responders in emergencies and natural disasters.”<sup>2</sup> As licensee of a non-geostationary orbit (“NGSO”) Fixed-Satellite Service (“FSS”) constellation designed to deliver broadband services direct to customers, SpaceX focuses here on competition in and deployment of fixed broadband services.

The Commission authorized SpaceX in 2018 to deploy and operate the Starlink NGSO system of more than 4,000 satellites using Ku- and Ka-band spectrum.<sup>3</sup> Over the last 12 months, SpaceX has launched 360 Starlink satellites and in the process has become the operator of the

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<sup>1</sup> See Public Notice, “Office of Economics and Analytics Seeks Comment on the State of Competition in the Communications Marketplace,” DA 20-199 (Feb. 27, 2020) (“Report PN”).

<sup>2</sup> *Comprehensive Review of Licensing and Operating Rules for Satellite Services*, 28 FCC Rcd. 12403, ¶ 2 (2013).

<sup>3</sup> See *Space Exploration Holdings, LLC*, 33 FCC Rcd. 3391, ¶ 11 (2018). SpaceX has since been granted two modifications of that license to better optimize its system’s characteristics. See *Space Exploration Holdings, LLC*, 34 FCC Rcd. 2526 (IB 2019); *Space Exploration Holdings, LLC*, 34 FCC Rcd. 12307 (IB 2019).

world's largest satellite fleet. At its current launch cadence, SpaceX anticipates that before the end of 2020 it will begin offering commercial service in the northern United States and southern Canada, and then will rapidly expand to near global coverage of the populated world in 2021. With performance that far surpasses that of traditional satellite Internet services, Starlink will deliver high-speed, low-latency broadband service direct to customers in rural and other locations where access has been unreliable, expensive, or completely unavailable.

The Commission requests comment on “whether laws, regulations, regulatory practices, or demonstrated marketplace practices pose a barrier to facilities-based competitive entry into the marketplace for the provision of fixed services, or to the competitive expansion of existing facilities-based service providers.”<sup>4</sup> SpaceX discusses below two areas in which Commission action and inaction inhibit competitive entry and expansion: (1) rules for NGSO systems that unintentionally but systematically work against U.S. licensees and in favor of non-U.S. systems; and (2) rules for Ka-band earth stations that impose unnecessarily onerous limitations on site availability. Addressing these concerns would remove unnecessary barriers and encourage competition to the benefit of all Americans.

**A. THE COMMISSION SHOULD REVISE RULES THAT UNINTENTIONALLY BUT SYSTEMATICALLY UNDERMINE U.S. NGSO LICENSEES**

The Commission's rules enable non-U.S. licensed NGSO satellite systems to participate in processing rounds alongside those NGSO applicants seeking a Commission license.<sup>5</sup> Such equitable treatment is, generally speaking, both pro-competitive and consistent with the United States' trade obligations. But that competition is undermined when the Commission's rules systematically give non-U.S. licensed NGSO systems *more favorable* treatment than is given to

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<sup>4</sup> Report PN at 3.

<sup>5</sup> See 47 C.F.R. § 25.137(c).

U.S.-licensed systems. Unfortunately – but almost certainly unintentionally – several Commission rules have exactly that effect. Those rules should be revised to level the playing field and thereby remove a potential impediment to licensing more U.S. operators that will equate to more robust competition among NGSO systems.

This favorable treatment starts as soon as a non-U.S. operator applies for access to the U.S. market. American NGSO operators seeking a U.S. license through a processing round must pay an application filing fee of \$471,575, while non-U.S. licensees that participate in the same processing round pay no filing fee whatsoever. Similarly, U.S. licensees must pay an annual regulatory fee of \$154,875 per NGSO system while non-U.S. licensees who serve the U.S. market pay no regulatory fee at all – though the Commission appears poised to close this loophole.<sup>6</sup> Moreover, these fees have steadily increased over the years, imposing an ever-higher burden on U.S. licensees. These fees of several hundred thousand dollars can be – and frequently are – easily sidestepped by operators who choose to be licensed in other countries but still seek access to the U.S. market and its consumers, which also has the effect of removing a significant deterrent against speculative processing round applications. The trend toward foreign licensing is evident in the data cited in the Commission’s recent regulatory fees proceeding, finding that nearly half of all satellite authorizations granted by the Commission between 2014 and 2018 (30 of 62) went to non-U.S.-licensed space station operators.<sup>7</sup> Indeed, in the first Ku/Ka-band NGSO processing round, more than half of the applicants (7 of 12) sought access to the U.S. market for a foreign system

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<sup>6</sup> The Commission recently released a draft order that would “level the playing field among space stations by assessing a regulatory fee on non-U.S. licensed space stations with United States market access.” *See Assessment and Collection of Regulatory Fees for Fiscal Year 2020*, Draft Report and Order and Notice of Proposed Rulemaking, FCC CIRC-2005-04 (rel. Apr. 22, 2020).

<sup>7</sup> *See Assessment and Collection of Regulatory Fees for Fiscal Year 2019*, 34 FCC Rcd. 8189, ¶ 65 n.155 (2019).

rather than applying for a U.S. license.<sup>8</sup> The Commission just initiated a second processing round in which two of the three initial participants are non-U.S. licensees.<sup>9</sup>

The favorable treatment does not end with the submission of an application – it extends throughout operation, even to the detriment of space safety. Non-U.S. licensees often avoid having to comply with the Commission’s rules for orbital debris mitigation. While the Commission’s rules require applicants for a U.S. license to provide extensive information on orbital debris issues, non-U.S. licensees applying to serve the U.S. market can avoid that requirement by arguing that “debris mitigation plans for the space station(s) for which U.S. market access is requested are subject to direct and effective regulatory oversight by the national licensing authority.”<sup>10</sup> As a result, many non-U.S. licensed systems gain access to the U.S. market without ever providing the Commission and other operators with crucial information about their operations and the potential impact of their systems on space safety. By its very nature, space defies geographic and political boundaries, such that solutions to address the space environment will be ineffective if applied to U.S. commercial satellite operators alone. As more NGSO system operators deploy an ever-larger number of satellites, transparency will become even more important. Yet the Commission will not have the information needed to make an informed decision and enforce the rules it has deemed necessary to ensure that space remains a safe environment for all. Worse, the Commission’s efforts to maintain a safe orbital environment will have little effect if its rules encourage operators to become licensed overseas where orbital debris rules are less demanding.

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<sup>8</sup> See applications accepted for filing in: Public Notice, 31 FCC Rcd. 7666 (IB 2016); Public Notice, 32 FCC Rcd. 4180 (IB 2017); and Public Notice, Rep. No. SAT-01259 (IB Aug. 11, 2017).

<sup>9</sup> See Public Notice, DA 20-325 (IB Mar. 24, 2020).

<sup>10</sup> 47 C.F.R. § 25.114(d)(14)(v).

The Commission need not tolerate such an outcome. As it found in its recent order updating the orbital debris mitigation rules, the allure of the U.S. market provides a formidable incentive for non-U.S. systems to conform to the Commission’s requirements.

Given the interest by many satellite operators in serving the U.S. market, this provides means for our regulations to have a broader reach than if the regulations were just to apply to operators seeking a U.S. license, and helps to ensure that non-U.S. licensees do not gain competitive advantage by following less rigorous debris mitigation practices than U.S.-licensed satellites.<sup>11</sup>

The Commission should not hesitate to use this leverage to achieve a safer operating environment for all who would make productive use of space.

In addition, several non-U.S. NGSO FSS operators are apparently coordinating to extend their favorable treatment to ensure they get first choice of shared spectrum in the United States. These operators have argued for an interpretation of the Commission’s rules for sharing spectrum in the absence of coordination that would grant them a consistent advantage over U.S. licensees. Specifically, they contend that an NGSO FSS operator should have first choice of shared spectrum under Section 25.261 based on the date the first satellite in its system is launched, even without a single earth station in the United States. They make this claim notwithstanding the express statement in the rule that its scope extends only to NGSO FSS operators with an earth station “anywhere in the world under a Commission license, or in the United States under a grant of U.S. market access.”<sup>12</sup> Under their flawed interpretation of the rule, non-U.S. operators would always be capable of operating first because they could launch under their foreign authorizations issued outside of and prior to any U.S. processing round. An operator could claim to be first to operate in the United States based on a satellite that was launched before it even applied to operate in

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<sup>11</sup> *Mitigation of Orbital Debris in the New Space Age*, FCC 20-54, ¶ 27 (rel. Apr. 24, 2020).

<sup>12</sup> 47 C.F.R. § 25.261(a).

United States,<sup>13</sup> before it even applied for a U.S. earth station license, and without ever actually providing service to U.S. customers.

These are just a few examples of the disparate treatment of U.S. operators under the Commission's rules, and this unequal treatment has real costs for American consumers. Operators seeking to avoid paying their fair share for the benefits they receive from the Commission will simply seek licensing in other countries. This leaves U.S. licensees to bear an unfair economic burden while depriving them of protections the Commission has deemed necessary in the interest of all those wishing to operate in space. Similarly, orbital debris mitigation rules that are selectively applied only to U.S. licensees will encourage satellite operators to forum shop internationally, leading to the undesirable outcome of systems with the worst safety profiles seeking licenses in countries with the loosest rules. Granting favorable treatment to foreign operators could also have a deleterious effect on U.S.-based manufacturing. SpaceX, for example, designs and manufactures all its own satellites in the United States. Moreover, the U.S. has a significant national security interest in maintaining oversight of providers that offer service to American consumers, including ensuring network equipment is secure. Those interests could be undermined if operators choose to license elsewhere with more favorable regulatory conditions. None of these results serve the public interest, and all of them can be ameliorated by leveling the playing field for U.S.-licensed and non-U.S. licensed satellite systems.

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<sup>13</sup> In fact, Kepler is explicitly claiming it is first to be capable of operation based on a launch that took place 10 months before it received its authorization to operate in the U.S. *See* Letter from Nickolas G. Spina to Marlene H. Dortch, IBFS File No. SAT-LOI-20160428-00041, at 1 (May 13, 2019) (claiming first launch on January 19, 2018).

## **B. THE COMMISSION SHOULD REBALANCE UNDULY BURDENSOME RESTRICTIONS ON KA-BAND GATEWAY EARTH STATION SITING**

The Commission has designated the 27.5-28.35 GHz band for use by the Upper Microwave Flexible Use Service (“UMFUS”) on a primary basis, with a secondary designation for FSS. However, Section 25.136(a)(4) of the Commission’s rules defines four elements that, if met, permit an earth station licensee to operate without providing additional interference protection to terrestrial UMFUS systems operating in the band.<sup>14</sup> The rule was designed “to provide FSS licensees with substantial opportunities to expand their limited use of the 28 GHz band to deploy earth stations that do not have to protect terrestrial services” while “not unduly hinder[ing] terrestrial deployment in the band.”<sup>15</sup> Unfortunately, SpaceX has found that the rule makes deployment of the earth stations unnecessarily difficult, potentially slowing deployment of service to Americans in the most remote regions on the country.

Under Section 25.136, to obtain an earth station license for operations in the 28 GHz band, FSS operators must comply with *each* of the following restrictions:

1. Satellite carriers may in the aggregate deploy earth stations in no more than three locations in a county.
2. The permitted interference zone<sup>16</sup> around an FSS earth station, *along with similar zones for any other FSS earth stations in the UMFUS licensed area*, may not cover more than a specified number of people in the license area where the earth station is located.
3. The FSS interference zone may not contain any major event venue, arterial street, interstate or U.S. highway, urban mass transit route, passenger railroad, or cruise ship port.

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<sup>14</sup> See 47 C.F.R. § 25.146(a)(4).

<sup>15</sup> *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, 31 FCC Rcd. 8014, ¶¶ 55, 56 (2016) (“*Spectrum Frontiers R&O*”).

<sup>16</sup> For this purpose, the “permitted interference zone” of an earth station is defined as the “area in which the earth station generates a power flux density (PFD), at 10 meters above ground level, of no more than -77.6 dBm/m<sup>2</sup>/MHz.” See 47 C.F.R. § 25.136 (a)(4)(ii).

4. If a UMFUS operator has facilities “constructed and in operation” within the interference zone of a proposed earth station site, the FSS operator must successfully complete coordination.

Instead of providing the opportunities the Commission envisioned *ex ante*, SpaceX has found that in reality, these restrictions pose significant practical barriers to identifying appropriate sites for gateway deployment. A very limited subset of U.S. candidate sites have the fiber connectivity and power resources necessary to support a gateway yet can still satisfy the siting limitations imposed in Section 25.136(a)(4).

The Commission recognizes that satellite gateway earth stations need ready access to long-haul, high data-rate Internet facilities.<sup>17</sup> In adopting the site restrictions for Ka-band gateways, the Commission cited a study showing the availability of long-haul Internet routes across the United States.<sup>18</sup> However, that report confirmed the high correlation between fiber and transportation corridors, finding that “a significant fraction of all the physical links are co-located with roadway infrastructure,” while “an even higher percentage are co-located with some combination of roadways *and* railway infrastructure.”<sup>19</sup> Indeed, the report also includes a graph summarizing the fraction of long-haul fiber optic links co-located with highway and railway infrastructure which approaches 1:1 – i.e., an extremely high level of correlation.<sup>20</sup> SpaceX has found that locating fiber access points that are not directly adjacent to highways or railroads is especially difficult in rural areas, presenting obstacles that risk slowing deployment to consumers in remote areas and could ultimately result in higher prices for rural customers as well by artificially suppressing competition. Ironically,

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<sup>17</sup> *Spectrum Frontiers R&O* ¶ 92.

<sup>18</sup> *Id.* ¶ 92 (citing R. Durairajan, P. Barford, J. Sommers and W. Willinger, *InterTubes: A Study of the US Long-haul Fiber-optic Infrastructure*, in Proceedings of ACM SIGCOMM (2015), <http://www.sigcomm.org/node/3852> (“InterTubes Report”).

<sup>19</sup> InterTubes Report at 570 (emphasis in original).

<sup>20</sup> *Id.*

such rural areas are the ones least likely to attract UMFUS deployment – meaning that the siting restrictions may be impeding earth station deployment to preserve terrestrial opportunities that are unlikely to be used.

The International Bureau has called for comment on the appropriate methodology for implementing the Ka-band earth station siting rules,<sup>21</sup> and several satellite operators have submitted suggestions for ways to create greater flexibility within the applicable restrictions and also to streamline application processing. However, there is only so much that implementation choices can do to ameliorate the unnecessarily burdensome limitations on site selection in the rule. As licensees gain greater experience with deployment in this band, the Commission should take the opportunity to learn from these experiences and refine its siting rules to ensure that they continue to strike an appropriate balance between the needs of FSS and UMFUS systems.

### **CONCLUSION**

A new generation of NGSO satellites promises to inject a healthy dose of competition into the market for fixed broadband services. The Commission can break down barriers to facilities-based competitive entry and encourage more deployment by new operators by revising its rules to (1) level the playing field for U.S.-licensed and foreign systems alike, and (2) rebalance unduly burdensome restrictions on Ka-band gateway earth station siting. SpaceX urges the Commission to pursue these improvements expeditiously for the benefit of the public interest.

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<sup>21</sup> See Public Notice, “International Bureau Seeks Comment on Implementing Earth Station Siting Methodologies,” 32 FCC Rcd. 5044 (IB 2017).

Respectfully submitted,

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