

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of )
Single Network Future: Supplemental Coverage ) GN Docket No. 23-65
from Space )
Space Innovation ) IB Docket No. 22-271

NOTICE OF PROPOSED RULEMAKING

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By the Commission: Chairwoman Rosenworcel and Commissioners Carr, Starks, and Simington issuing
separate statements

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## I. INTRODUCTION

1. In this item, we take a global leadership role in facilitating the integration of satellite and terrestrial networks by proposing a new regulatory framework for Supplemental Coverage from Space (SCS). Through this novel approach, satellite operators collaborating with terrestrial service providers would be able to obtain Commission authorization to operate space stations on currently licensed, flexible-use spectrum allocated to terrestrial services, thus expanding coverage to the terrestrial licensee’s subscribers, especially in remote, unserved, and underserved areas. This framework could enable innovation and investment in nascent satellite and terrestrial interoperable technologies and cross-industry stakeholder partnerships to flourish in the United States, and play a key role towards fulfilling other Commission goals in the public interest. These goals include facilitating ubiquitous wireless coverage across the nation; expanding the availability of emergency communications to consumers and the geographic range of first responders to provide emergency services; and promoting competition in the provision of wireless services to consumers, among others.

2. We anticipate that our proposed SCS approach will incentivize creative partnerships between terrestrial network and space station operators and will provide additional tools to close wireless coverage gaps, while retaining high service quality among our nation’s 4G and 5G terrestrial networks, protecting spectrum usage rights, and avoiding harmful interference. Moreover, by carefully examining potential regulatory changes required to facilitate provision of emerging global services through tailored business arrangements in the context of a rulemaking proceeding, rather than relying exclusively on an ad-hoc waiver approach, we aim to foster widespread stakeholder interest through clear rules generally applicable to all, thus yielding a robust record for Commission consideration of long-term solutions in the public interest.

## II. BACKGROUND

### A. Market Developments and Terrestrial/Satellite Partnership Efforts

3. As technologies with advanced capabilities evolve and wireless customers’ demand for seamless connectivity grows, even in remote locations currently lacking wireless coverage, stakeholders are seeking ways to leverage satellite communications to provide expanded coverage to consumer handsets. Recent news reports have highlighted interest in this evolving market with partnerships between satellite service<sup>1</sup> providers and terrestrial wireless service<sup>2</sup> providers to facilitate this type of enhanced capability. According to these reports, in addition to increased consumer demand, other factors driving this trend include lower satellite bandwidth prices and the “broad acceptance of the [3rd Generation Partnership Project (3GPP)] wireless standard.”<sup>3</sup>

<sup>1</sup> We use the term “satellite service” to mean “space radiocommunications.” See ITU Radio Regulations Article 1.8 (defining space radiocommunications as “[a]ny radio communications involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space.”).

<sup>2</sup> We use the term “terrestrial wireless service,” “terrestrial service,” or “wireless service” to mean fixed and mobile services. See ITU Radio Regulations Article 1.7, 1.20, and 1.24.

<sup>3</sup> See, e.g., Jeffrey Hill, *Satellite, Cellular ‘Convergence’ Takes Center Stage at Mobile World Congress Las Vegas*, (Oct. 3, 2022), <https://www.satellitetoday.com/5g/2022/10/03/satellite-cellular-convergence-takes-center-stage-at-mobile-world-congress-las-vegas/>.

4. *Use of Current Satellite-Allocated Spectrum to Serve Commercial Handsets.* Some recently announced collaborations rely on the use of spectrum currently allocated to satellite services to provide expanded service options to subscribers using smartphones, as distinct from specially-provisioned satellite phones.<sup>4</sup> For example, in November 2022, Globalstar and Apple jointly announced a proprietary service using Globalstar’s licensed satellite spectrum to provide emergency messaging for Apple’s iPhone 14 and 14 Pro devices when no cellular or Wi-Fi service is available.<sup>5</sup> According to Apple, its iPhone 14 communicates with the existing Globalstar satellite network for emergency purposes,<sup>6</sup> and this technology has already been used to enable emergency services in at least one instance.<sup>7</sup> Bullitt, a UK-based smartphone maker, announced plans to leverage 3GPP-based 5G technology standards, specifically the 2022 3GPP Release 17 specifications, in its ongoing efforts to connect its smartphones directly to satellites on spectrum allocated to satellite services.<sup>8</sup> Iridium, a satellite communications provider, and chip maker Qualcomm recently announced their partnership and plans to connect smartphones with Iridium’s satellite constellation with a product called Snapdragon Satellite, enabling emergency messaging in late 2023.<sup>9</sup> Other established satellite service providers, such as EchoStar and Viasat, have also indicated that they would be interested “in operating satellites that may connect to phones.”<sup>10</sup> Similar collaborative efforts are underway by other operators, as well.

5. 3GPP’s Release 17 standards were the first to include input from non-terrestrial network (NTN) groups and to address satellite’s role in the development of 5G systems worldwide. Its specifications will support New Radio (NR) based satellite access deployed in the Frequency Range 1 bands<sup>11</sup> serving handsets as well as NB-IoT (narrowband Internet of Things) and LTE-M based access for

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<sup>4</sup> In these scenarios, satellite operators are authorized under part 25 of the Commission’s rules to use spectrum currently allocated for mobile-satellite service to provide such service (space-to-Earth) to smartphones.

<sup>5</sup> See Press Release, Apple, *Emergency SOS via Satellite Available Today on the iPhone 14 Lineup in the US and Canada* (Nov. 15, 2022), <https://www.apple.com/newsroom/2022/11/emergency-sos-via-satellite-available-today-on-iphone-14-lineup/>; Mitchell Clark, *Satellite-to-Phone Companies are Thrilled About SpaceX and T-Mobile, Actually*, (Aug. 27, 2022), <https://www.theverge.com/2022/8/27/23324128/t-mobile-spacex-satellite-to-phone-technology-ast-lynk-industry-reactions-apple> (Satellite-to-Phone Companies Aug. 27, 2022 Article).

<sup>6</sup> See Rachel Jewett, *Apple to Debut iPhone with Emergency Messaging Enabled by Globalstar Satellites*, (Sept. 7, 2022), <https://www.satellitetoday.com/telecom/2022/09/07/apple-to-debut-iphone-with-emergency-messaging-enabled-by-globalstar-satellites/>.

<sup>7</sup> See Emily Mae Czachor, *iPhone Emergency Feature Helps Rescue 2 After Canyon Plunge in California*, (Dec. 15, 2022), <https://www.cbsnews.com/news/iphone-emergency-sos-satellite-car-crash-canyon/>.

<sup>8</sup> See Mike Dano, *In the Race to Space, Bullitt Eschews Proprietary Approaches*, (Nov. 2, 2022), <https://www.lightreading.com/satellite/in-race-to-space-bullitt-eschews-proprietary-approaches/d/d-id/781489>.

<sup>9</sup> See Press Release, Qualcomm, *Qualcomm Introduces Snapdragon Satellite, The World’s First Satellite-Based Solution Capable of Supporting Two-Way Messaging for Premium Smartphones and Beyond* (Jan. 5, 2023), <https://www.qualcomm.com/news/releases/2023/01/qualcomm-introduces-snapdragon-satellite-the-world-s-first-sate>; Jason Rainbow, *Iridium and Qualcomm to Bring Satellite Connectivity to Smartphones this Year*, (Jan. 5, 2023), <https://spacenews.com/iridium-and-qualcomm-to-bring-satellite-connectivity-to-smartphones-this-year/>. The companies claim that potential uses include emergency SOS services, SMS texts, and other low-bandwidth messaging applications in areas outside terrestrial networks and where Iridium’s global constellation is licensed to operate.

<sup>10</sup> See Mike Dano, *Viasat, EchoStar and Iridium Hint at Cellular-to-Satellite Interest*, (Nov. 9, 2022), <https://www.lightreading.com/satellite/viasat-echostar-and-iridium-hint-at-cellular-to-satellite-interest/d/d-id/781663/>.

<sup>11</sup> Frequency Range 1 bands refers to bands below 24 GHz. Release 17 identified two bands with existing MSS allocations for 5G NTN provision: band 255 (1525 MHz – 1559 MHz and 1626.5 MHz – 1660.5 MHz) and band 256 (1980 MHz – 2010 MHz and 2170 MHz – 2200 MHz). See Munira Jaffar & Nicolas Chuberre, *NTN & Satellite* (continued....)

eMTC (enhanced machine-type communication) using satellites.<sup>12</sup> In addition, 3GPP Releases 17 and 18 include extension of NTN to Frequency Range 2, including operation in the Ku-band. Satellite companies, such as EchoStar, have long encouraged 3GPP to incorporate satellite components.<sup>13</sup> These companies recognize that satellites can be an important means to provide connectivity to underserved and unserved areas.

6. *Efforts to Use Spectrum Currently Allocated to Terrestrial Services to Directly Serve Handsets and Other End-user Devices from Satellites.* A growing number of satellite companies are seeking to partner with mobile service providers to provide mobile-satellite services through interoperable technologies. Such an approach proposes to rely on satellite operators using spectrum currently allocated for terrestrial mobile service that is exclusively-licensed to terrestrial service providers and subject to an existing terrestrial service regulatory framework, and therefore requires further Commission action to enable satellite use.

7. In August 2022, Space Exploration Technologies Corporation (SpaceX) announced that the second generation of its Starlink satellites will be able to connect T-Mobile's subscribers in rural and remote locations to fill coverage gaps in T-Mobile's terrestrial network by providing a text messaging service anticipated to be available in late 2023.<sup>14</sup> Specifically, SpaceX and T-Mobile are proposing a partnership whereby SpaceX would use a block of T-Mobile's mid-band Personal Communications Services (PCS) spectrum held over a nationwide footprint.<sup>15</sup> If authorized, SpaceX's Starlink, a constellation of satellites in low Earth orbit (LEO), would enable the provision of service in areas outside the reach of T-Mobile's current network. On February 7, 2023, SpaceX filed an application with the Commission detailing its proposed partnered service, including a request for authorization for SpaceX to use T-Mobile's PCS G block spectrum for "direct-to-cellular" operations.<sup>16</sup> The application includes

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in *Rel-17 & 18*, (July 1, 2022), <https://www.3gpp.org/news-events/partner-news/ntn-rel17> (NTN & Satellite July 1, 2022 Article). Frequency Range 2 bands refers to bands above 24 GHz, specifically 24.25 GHz to 52.6 GHz.

<sup>12</sup> See NTN & Satellite July 1, 2022 Article, *supra* note 11. The authors suggest that terrestrial/satellite partnerships "will enable the full integration of satellite in the 3GPP ecosystem and define a global standard for future satellite networks. This will address the challenges of reachability and service continuity in unserved/underserved areas, enhance reliability through connectivity between various access technologies, and improve network resilience and dependability in responding to natural and man-made disasters." *Id.*

<sup>13</sup> See The Hughes Team, *Upcoming 3GPP Release 17 to Include Satellite in Global 5G Standard*, (June 22, 2021), <https://www.hughes.com/resources/insights/5g/upcoming-3gpp-release-17-include-satellite-global-5g-standard>; see also Press Release, EchoStar, *EchoStar Begins Construction of Global S-band Network* (Feb. 1, 2023), <https://ir.echostar.com/news-releases/news-release-details/echostar-begins-construction-global-s-band-network> (announcing EchoStar's agreement with Astro Digital for the construction of a global S-band MSS network to deliver global IoT, machine-to-machine (M2M) and other data services through a constellation intended "to serve as a foundation for EchoStar to engineer 5G New Radio (NR) based NTN capabilities according to 3GPP release 17 specifications"); Skylo Team, *MediaTek and Skylo Collaborate on Next-Gen 3GPP NTN Satellite Solutions on Smartphones and Wearables*, (Feb. 14, 2023), <https://www.skylo.tech/newsroom/mediatek-and-skylo-collaborate-on-next-gen-3gpp-ntn-satellite-solutions-on-smartphones-and-wearables> (announcing the continuing partnership between Skylo, an NTN service provider, and chipset manufacturer MediaTek, to work toward the integration of "cellular and satellite connectivity into the same device").

<sup>14</sup> See *T-Mobile Takes Coverage Above and Beyond with SpaceX*, (Aug. 25, 2022), <https://www.t-mobile.com/news/un-carrier/t-mobile-takes-coverage-above-and-beyond-with-spacex> (T-Mobile Aug. 25, 2022 Article); Rachel Jewett, *Elon Musk Announces SpaceX Starlink Cellular Partnership with T-Mobile*, (Aug. 25, 2022), <https://www.satellitetoday.com/telecom/2022/08/25/elon-musk-announces-spacex-starlink-cellular-partnership-with-t-mobile/> (SpaceX Aug. 25, 2022 Article).

<sup>15</sup> SpaceX Aug. 25, 2022 Article, *supra* note 14.

<sup>16</sup> See Space Exploration Holdings, LLC Application for Modification of Authorization for the SpaceX Gen2 NGSO Satellite System to Add a Direct-to-Cellular System, IBFS File No. SAT-MOD-20230207-00021 Call Sign S3069

(continued....)

several requests for waiver of various Commission rules in part 25 and the United States Table of Frequency Allocations (U.S. Table) to implement the proposed service.<sup>17</sup> The parties also filed a notification of a spectrum manager lease arrangement between themselves that requests, if associated waivers are granted, authority for SpaceX to operate from a space-based radiofrequency communications system on broadband PCS spectrum licensed to T-Mobile's operating subsidiaries in the contiguous United States (CONUS), parts of Alaska, Hawaii, and Puerto Rico.<sup>18</sup>

8. For the past few years, other companies have been exploring this type of satellite-terrestrial collaboration. Outside of the United States, Lynk Global (Lynk) has partnered with a number of mobile network operators (MNOs) around the world to enable their customers to send texts using Lynk's satellite network.<sup>19</sup> Lynk operates with mobile devices using frequencies already used for terrestrial mobile service.<sup>20</sup> Like the SpaceX/T-Mobile proposal, Lynk has emphasized the public safety importance of this type of service during emergencies and natural disasters, such as hurricanes, wildfires, flooding, or earthquakes, which often cause the destruction of or damage to terrestrial mobile network equipment and resulting service outages. Lynk has launched several satellites and is in the process of launching additional satellites for its network and, as discussed in more detail below, has received Commission authority to test communications between satellites and mobile devices, and conditional authority to deploy and operate its 10-satellite system for service to locations outside the United States.<sup>21</sup>

9. AST SpaceMobile (AST) is also engaged in this trend and deployed its test BlueWalker 3 satellite in November 2022, indicating its plans to develop a global network to provide service directly from its satellites to smartphones.<sup>22</sup> BlueWalker 3 is AST's second test satellite, and AST plans to begin deploying its operational BlueBird satellites in late 2023. Like Lynk, AST has partnered with several MNOs for its planned service, including AT&T and Vodafone, and the partnerships are described as being capable of bringing service to remote and "off-grid" locations.<sup>23</sup> AST has filed applications for market access to the United States, but following several amendments, its current request is limited to

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(filed Feb. 7, 2023) (SpaceX and T-Mobile Application). The SpaceX and T-Mobile Application requests authority to modify an existing SpaceX authorization for its second-generation NGSO FSS license. *See infra* para. 15.

<sup>17</sup> SpaceX and T-Mobile Application.

<sup>18</sup> *See* ULS File Nos. 0010303032, 0010303146, 0010303124, and 0010303084 (filed Dec. 6, 2022, and amended Feb. 7, 2023).

<sup>19</sup> Lynk claims that, in early 2020, it was the first company to send a text message to an unmodified cell phone from space. *See* Satellite-to-Phone Companies Aug. 27, 2022 Article, *supra* note 5.

<sup>20</sup> *Lynk Global, Inc., Application to Deploy and Operate Space Stations Filed Under the FCC Streamlined Small Space Station Authorization Process*, 47 CFR § 25.122, IBFS File No. SAT-LOA-20210511-00064 Call Sign S3087, Order and Authorization, DA 22-969, 2022 WL 4358414, at \*1 (IB Sept. 16, 2022) (*Lynk Order*).

<sup>21</sup> *See infra* paras. 12-13.

<sup>22</sup> *See* Michael Sheetz, *AST SpaceMobile Hits Key Milestone Toward Satellite-to-Smartphone 5G Service*, (Nov. 14, 2022), <https://www.cnbc.com/2022/11/14/ast-spacemobile-deploys-bluewalker-3-satellite-antenna.html>.

<sup>23</sup> *Id.*; *see also* *Vodafone's Collaboration with AST SpaceMobile and What it Means for Customers*, (Feb. 16, 2022), <https://www.vodafone.com/news/technology/vodafone-ast-space-mobile-collaboration> (reporting that initial phase of AST's partnership with Vodafone is planned to cover "the 49 largest countries in the equatorial regions, including a number of markets where [Vodafone] operates in Africa, subject to regulatory approval."); Sue Marek, *AT&T CEO Says Company is Ahead in Satellite-to-Cellular Connectivity*, (Oct. 6, 2022), <https://www.fiercewireless.com/wireless/att-ceo-says-company-ahead-satellite-cellular-connectivity> (reporting that AT&T is also partnering with AST to ultimately provide connectivity in dead zones in the United States); Scott Moritz, *AT&T CEO Says His Satellite Service Has Lead on Musk's*, (Oct. 5, 2022), <https://www.bloomberg.com/news/articles/2022-10-05/at-t-ceo-says-his-satellite-phone-service-has-lead-over-musk-s>.

frequencies for feeder links only, with no current request for direct-to-handset market access.<sup>24</sup> Other satellite companies have indicated interest in using terrestrial spectrum for satellites to communicate with Internet of Things (IoT) devices. Lacuna Space plans to offer communication to IoT devices with satellites that will communicate using the LoRaWAN protocol designed to connect IoT devices to terrestrial networks using 902-928 MHz terrestrial spectrum, and has announced collaborations with equipment manufacturers and other providers in this effort.<sup>25</sup> The company has successfully launched some satellites licensed by another administration, but has not yet applied for U.S. market access.<sup>26</sup>

#### **B. FCC Actions to Facilitate Satellite and Terrestrial Collaborations**

10. The Commission has granted a number of experimental licenses and other satellite authorizations to facilitate innovation and investment and to support the development of collaborations between satellite service providers and terrestrial wireless providers that will better serve consumers, particularly in underserved and remote locations and in emergency situations. These Commission actions enable companies to test interoperability between satellites and mobile services in various bands, as well as encourage innovation in the provision of satellite services to smartphones and other end-user devices.

11. *Experimental Authorizations.* In 2017, the Commission's International Bureau (IB) and Office of Engineering and Technology (OET) granted Higher Ground LLC (Higher Ground) a waiver of the Table of Frequency Allocations and the fixed-satellite service (FSS) coordination rules for the company to use satellites in the 6 GHz band (allocated for the FSS and Fixed Service) to provide a commercially available text messaging service using a sleeve that attaches to smartphones.<sup>27</sup> This grant followed Higher Ground's initial operations under experimental licenses dating back to 2014.<sup>28</sup> In 2021 and 2022, OET granted Totum Labs, Inc. (Totum) two experimental licenses: one for a satellite communicating with a single earth station in San Diego, CA, and the other for satellite communications with the San Diego earth station as well as "mobile station locations."<sup>29</sup> These experimental licenses allow Totum to test satellite communication and tracking of IoT devices in the 2400-2483.5 MHz band using spread spectrum waveforms.<sup>30</sup> In 2021 and 2022, OET granted several experimental licenses allowing Lynk to test communications between satellites and "mobile station locations" in the 800 MHz

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<sup>24</sup> See AST & Science LLC, Application for Fixed Satellite Service Mobile Satellite Service, IBFS File Nos. SAT-PDR-20200413-00034 (filed Apr. 13, 2020), SAT-APL-20200727-00088 (filed July 27, 2020), SAT-APL-20201028-00126 (filed Oct. 28, 2020), Call Sign S3065.

<sup>25</sup> See Lacuna.Space, *Omnispace and Lacuna Announce Collaboration to Deliver Global LoRaWAN® IoT Service*, (Mar. 9, 2021), <https://lacuna.space/omnispace-and-lacuna-announce-collaboration-to-deliver-global-lorawan-iot-service/>; Lacuna.Space, *Lacuna and Semtech Expand LoRaWAN® Coverage through IoT to Satellite Connectivity*, (Jan. 11, 2022), <https://lacuna.space/lacuna-and-semtech-expand-lorawan-coverage-through-iot-to-satellite-connectivity/>.

<sup>26</sup> Lacuna.Space, *First Successful LacunaSat Launch in 2021!*, (Mar. 22, 2021), <https://lacuna.space/first-successful-lacunasat-launch-in-2021/#:~:text=22%20March%202021,onboard%20the%20Soyuz%2D2%20launcher>.

<sup>27</sup> See *Higher Ground Application for Blanket Earth Station License*, IBFS File No. SES-LIC-20150616-00357 Call Sign E150095, Order and Authorization, 32 FCC Rcd 728 (Jan. 18, 2017) (*Higher Ground Waiver Order*). Higher Ground is required to prevent the devices from transmitting where they may cause interference to the microwave links in the band. *Id.*

<sup>28</sup> *Higher Ground Waiver Order*, 32 FCC Rcd at 731 n.8.

<sup>29</sup> See ELS File No. 0391-EX-CN-2020 (granted Jan. 14, 2021); ELS File No. 0044-EX-CM-2022 (granted May 12, 2022). The relevant satellites are operated by Loft Orbital Solutions, Inc. pursuant to a satellite license conditional grant from IB in May 2021. See Loft Orbital Solutions, Inc., Application for Earth Exploration Satellite Service Other, IBFS File No. SAT-LOA-20200907-00105 (granted May 24, 2021).

<sup>30</sup> See ELS File No. 0391-EX-CN-2020; ELS File No. 0044-EX-CM-2022.

band.<sup>31</sup> In 2022, OET also granted an experimental license to AST for earth stations to communicate with a satellite licensed by Papua New Guinea and to be registered with the International Telecommunication Union (ITU) by Spain.<sup>32</sup> AST's experimental license will allow testing that will inform its plan to provide 4G and 5G broadband connectivity in unserved and underserved areas.<sup>33</sup> OET has also granted experimental licenses to Omnispace LLC for testing communications with its Medium Earth Orbit satellite in the 2 GHz S band.<sup>34</sup> Various parties continue to file experimental license applications to test space-based communications with points on Earth, and the Commission will continue to process them accordingly.

12. *Lynk Order.* In 2021, Lynk filed an application for authority to operate a non-geostationary satellite orbit (NGSO)<sup>35</sup> satellite system that would enable text message communications at locations outside the United States, and in countries where Lynk has obtained agreements with MNOs and the requisite local regulatory authority to provide service.<sup>36</sup> In its application, Lynk sought: (1) authority to deploy ten NGSO mobile-satellite service (MSS) and FSS satellites as part of a "cellular-based satellite communications network" that will provide connectivity by operating on most cellular frequencies used globally in the 617-960 MHz band in international markets only; and (2) feeder link and telemetry, tracking, and command (TT&C) operations in the Ka-band both domestically and outside of the United States, with the S-band serving as backup for emergency TT&C.<sup>37</sup>

13. On September 16, 2022, IB granted, with conditions, Lynk's application to construct, deploy, and operate NGSO satellites in low-Earth orbit (LEO).<sup>38</sup> In granting the application, IB found it in the public interest to begin making Lynk's services accessible, with the goal of providing connectivity in remote areas during emergencies, contingent upon obtaining appropriate approval in the relevant jurisdictions and the completion of coordination with other operators.<sup>39</sup> In limiting its approval to transmissions with earth stations outside of the United States, IB specifically noted that its decision was without prejudice to action on any applications to provide similar service in the United States.<sup>40</sup> Given the limited scope of Lynk's authority to provide service outside of the United States and grant conditions imposed to ensure operations do not cause harmful interference, IB found that it was unnecessary to deny or defer action on the Lynk application until the Commission could conduct a rulemaking or related

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<sup>31</sup> See ELS File No. 0931-EX-CN-2020 (granted May 17, 2021); ELS File No. 0162-EX-CN-2021 (granted Mar. 19, 2021); ELS File No. 0656-EX-CN-2021 (granted Nov. 19, 2021). In May 2022, OET granted licenses to Lynk for additional satellites that were expected to launch in late 2022 and early 2023. See ELS File No. 0117-EX-CN-2021 (granted May 25, 2022); ELS File No. 0113-EX-CN-2022 (granted May 25, 2022). Lynk deployed and began operating the first satellite, Lynk Tower 1, in April 2022 pursuant to experimental authority. See ELS File No. 0656-EX-CN-2021 (granted Nov. 19, 2021); Letter from Shawn Marcum, Director of Legal and Regulatory Affairs to Lynk, to Marlene H. Dortch, Secretary, FCC, at 1 (Apr. 12, 2022).

<sup>32</sup> See ELS File No. 1059-EX-CN-2020 (granted June 2, 2022). This license was modified in early 2023 to add a mobile station location in Hana, Hawaii. See ELS File No. 0208-EX-CN-2022 (granted Feb. 9, 2023).

<sup>33</sup> See Narrative attached to AST & Science LLC application for ELS File No. 1059-EX-CN-2020 (granted June 2, 2022).

<sup>34</sup> See, e.g., ELS File No. 0018-EX-CN-2023 (granted Feb. 14, 2023), which modifies ELS File No. 1343-EX-CN-2022 (granted Jan. 9, 2023) to add two station locations in Brewster, Washington, and Tysons, Virginia, to the already authorized location in Gainesville, Georgia.

<sup>35</sup> See 47 CFR § 25.103.

<sup>36</sup> See Lynk Global, Inc., IBFS File No. SAT-LOA-20210511-00064, Narrative at 2 (Lynk Application).

<sup>37</sup> *Id.*

<sup>38</sup> See generally *Lynk Order*.

<sup>39</sup> See *id.* at 3-4, para. 7.

<sup>40</sup> *Id.* at 7, para. 15.

proceeding to determine whether the Commission should adopt rules of general applicability to permit use of terrestrial wireless frequencies for satellite communications and how such services should be regulated.<sup>41</sup>

14. *AST Applications.* AST has pending applications with the Commission requesting U.S. market access for gateway links in the V-band for its SpaceMobile satellite system, which would be comprised of 243 LEO satellites.<sup>42</sup> Although AST requests authority to operate in the United States, it clarifies that it is not seeking to operate on terrestrial frequencies independent of a terrestrial licensee partner,<sup>43</sup> and intends to seek specific authority to operate on terrestrial spectrum through future lease arrangements with a terrestrial partner.<sup>44</sup> Further, AST states that it is not seeking changes to the Table of Frequency Allocations or waivers related to terrestrial frequencies allocated to parts 24 and 27 of the Commission's rules.<sup>45</sup> AST contends that its SpaceMobile system will enable terrestrial licensee partners to extend coverage to areas where terrestrial service is otherwise unavailable due to financial or environmental challenges to further access to broadband cellular connectivity.<sup>46</sup>

15. *SpaceX NGSO Gen2 Starlink Order.* The Commission recently authorized SpaceX's efforts to develop and expand its Starlink satellite network.<sup>47</sup> On December 1, 2022, the Commission granted SpaceX authority to construct, deploy, and operate up to 7,500 NGSO satellites, using frequencies in the Ku- and Ka-bands to provide FSS, as part of its "second-generation" Starlink constellation (Gen2 Starlink), subject to certain conditions.<sup>48</sup> We note that the Gen2 Starlink Order does not authorize SpaceX to use frequencies allocated only for terrestrial operations.<sup>49</sup>

### C. Current U.S. and International Allocations of Bands Subject to Notice Proposal

16. The Table of Frequency Allocations (Table) is comprised of the International Table of Frequency Allocations (International Table) and the United States Table of Frequency Allocations (U.S. Table).<sup>50</sup> Our rules require the use of frequencies and frequency bands to be in accordance with the U.S.

<sup>41</sup> *Id.* at 5-7, paras. 11-12, 16.

<sup>42</sup> See AST & Science LLC, Amendment to Petition for Declaratory Ruling, IBFS File No. SAT-APL-20201028-00126 Call Sign S3065 (filed Oct. 28, 2020), amending IBFS File Nos. SAT-PDR-20200413-00034 and SAT-APL-20200727-00088.

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> On March 28, 2018, the Commission granted SpaceX authority to deploy and operate its first-generation NGSO satellite system comprising 4,425 satellites operating in the Ku- and Ka-bands for provision of FSS (Gen1 Starlink). Subsequently, the Commission granted three license modifications for the Gen1 Starlink system, and a number of requests for Special Temporary Authority (STA) for LEOP and payload testing operations, and to adjust earth station elevation angles. See *In the Matter of Space Exploration Holdings, LLC Request for Orbital Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System*, IBFS File Nos. SAT-LOA-20200526-00055 and SAT-AMD-20210818-00105 Call Sign S3069, Order and Authorization, FCC 22-91, 2022 WL 17413767, at \*3 (Dec. 1, 2022) (*SpaceX Gen2 Order*), appeals pending sub nom. *Int'l Dark Sky Ass'n v. FCC*, No. 22-1337 (D.C. Cir. filed Dec. 30, 2022), *Dish Network Corp. v. FCC*, No. 23-1001 (D.C. Cir. filed Jan. 3, 2023).

<sup>48</sup> See *SpaceX Gen2 Order* at para. 1.

<sup>49</sup> As discussed above, SpaceX recently filed an application to modify its Gen2 Starlink authorization. See *supra* para. 7.

<sup>50</sup> The International Table is described in 47 CFR § 2.104 and the U.S. Table is described in 47 CFR § 2.105. The International Telecommunication Union (ITU) has divided the world into three geographic Regions (Region 1, Region 2, and Region 3). As a member administration, the United States is included in Region 2. See *List of ITU Member States*, [https://www.itu.int/en/ITU-R/terrestrial/fmd/Pages/administrations\\_members.aspx](https://www.itu.int/en/ITU-R/terrestrial/fmd/Pages/administrations_members.aspx) (last visited Feb. (continued....))



Table,<sup>51</sup> and where such use is inconsistent with the International Table, operations must be on a non-interference basis, meaning they cannot cause harmful interference to nor claim protection from harmful interference caused by other services that operate in accordance with ITU Radio Regulations in other countries.<sup>52</sup> A proposed SCS system involving space and earth station transmissions on spectrum bands allocated only for fixed and/or mobile service would require that the U.S. Table be modified to enable Earth-to-space and space-to-Earth operations in the relevant bands.

17. Below we describe the current state of allocations, both in the U.S. Table and the International Table, for select bands currently allocated and assigned for terrestrial mobile service and containing licensee(s) meeting certain entry criteria proposed in this Notice, for possible use in the provision of SCS to close terrestrial network coverage gaps.<sup>53</sup> We note that there are coordination requirements within the National Radio Quiet Zone in each of the six bands.<sup>54</sup>

18. *600 MHz Band.* The 600 MHz band consists of seven paired five-megahertz blocks at 614-698 MHz, with each block having five megahertz in the uplink band (663-698 MHz) and five megahertz in the downlink band (617-652 MHz).<sup>55</sup> In the U.S. Table, the band has no federal allocation and is allocated on a primary basis for non-federal fixed and mobile services.<sup>56</sup> Internationally, in Region 2, the band is allocated on a primary basis to broadcasting and on a secondary basis for fixed and mobile services, but international country footnotes elevate the fixed and mobile allocation to primary status in the United States and certain other countries in Region 2 for International Mobile Telecommunications (IMT).<sup>57</sup> In Region 3, the band is allocated on a primary basis to broadcasting, fixed, and mobile operations.<sup>58</sup> We note that some LPTV/translator TV stations remain in the band, but are permitted to operate only on a secondary basis to flexible-use wireless operations.<sup>59</sup> In addition to the LPTV/translator stations, there are also wireless microphones and white space devices operating on a license-by-rule basis.<sup>60</sup> In Region 1, the band is allocated to broadcasting on a primary basis.<sup>61</sup>

(Continued from previous page)

15, 2023); *see also* 47 CFR §§ 2.104(b), 2.105(a). The U.S. Table is subdivided into the Federal Table of Frequency Allocations, displaying allocations for Federal use, and the non-Federal Table of Frequency Allocations, displaying the allocations for non-Federal use that the FCC administers. The U.S. Table applies to the use of radio frequencies in those areas subject to the jurisdiction of the United States.

<sup>51</sup> 47 CFR § 2.102(a).

<sup>52</sup> *Id.* § 2.102(b); ITU Radio Regulations Article 4.4, Edition of 2020 (stating that non-conforming uses “shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the [ITU] Constitution, the Convention and these Regulations.”).

<sup>53</sup> We note that, in some cases, only a portion (e.g., block) of a given band might contain licensees able to meet the proposed entry criteria to be eligible for licensing to provide SCS.

<sup>54</sup> *See* 47 CFR § 1.924.

<sup>55</sup> *See id.* § 2.106.

<sup>56</sup> *Id.*; *see also* 47 CFR § 2.105(c) (describing the categories of services and noting that stations of a secondary status shall not cause harmful interference to stations of a primary status and cannot claim protection from harmful interference from stations of a primary service).

<sup>57</sup> *See* 47 CFR § 2.106 nn.5.293 & 5.308A.

<sup>58</sup> *Id.*

<sup>59</sup> *Id.* § 2.106 n.NG33.

<sup>60</sup> *Id.* § 2.106 n.NG115.

<sup>61</sup> We note that spectrum use in the 470-960 MHz band in Region 1 will be reviewed by WRC-23 agenda item 1.5 in accordance with Resolution 235 (WRC-15). In particular, the review will consider the spectrum requirements of the broadcasting and mobile, except aeronautical mobile, service in 470-960 MHz.

19. *700 MHz Band.* The 700 MHz service is divided into two sub-bands: the Lower 700 MHz Service (698-746 MHz) and the Upper 700 MHz (746-758 MHz, 775-788 MHz, and 805-806 MHz).<sup>62</sup> The Lower 700 MHz Band is divided into eight 6 megahertz blocks—three paired sets (A, B, and C blocks) and two unpaired blocks (D and C blocks).<sup>63</sup> The Upper 700 MHz Band is divided into 4 blocks: A and B blocks (paired 1 megahertz blocks), C block (paired 11 megahertz blocks), and D block (paired 10 megahertz blocks, with two spectrum bands devoted to public safety operations (758-775 MHz and 788-805 MHz).<sup>64</sup> These sub-bands are allocated on a primary basis for fixed, mobile, and broadcasting, both in the U.S. and International Tables, as part of larger allocations at 698-763 MHz and 775-793 MHz.<sup>65</sup> There are no federal or secondary allocations for the band.<sup>66</sup> In Region 1, the band is allocated to broadcasting and mobile except aeronautical on a co-primary basis.<sup>67</sup>

20. *800 MHz Cellular Band.* The 800 MHz Cellular Radiotelephone Service (824-849 MHz and 869-894 MHz) provided the original foundation for the commercial wireless industry, with rules dating back to 1981.<sup>68</sup> It is divided into two 25 megahertz blocks.<sup>69</sup> Today, this band has been updated to mirror most of the flexible use rules found in other commercial bands, and is now used in modern LTE networks.<sup>70</sup> The band is allocated for non-federal fixed and land mobile use on a co-primary basis in the U.S. Table, with no federal allocation. Internationally, most of the band is allocated for fixed, mobile, and broadcasting in Regions 2 and 3, but the uppermost portion of the band (890-894 MHz) has different allocations in Regions 2 and 3: in Region 2, the band is allocated for fixed and mobile (except aeronautical) use on a primary basis and for radiolocation on a secondary basis; in Region 3, it is allocated for fixed, mobile, and broadcasting use on a co-primary basis and for radiolocation on a secondary basis. In Region 1, the band is allocated to broadcasting and mobile except aeronautical on a co-primary basis.<sup>71</sup>

21. *Broadband PCS.* Broadband PCS consists of paired blocks, with the lower blocks between 1850-1915 MHz and the upper blocks between 1930-1995 MHz. The A, B, and C blocks are 15

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<sup>62</sup> See FCC, *Revised 700 MHz Band Plan for Commercial Services*, <https://www.fcc.gov/sites/default/files/wireless/auctions/data/bandplans/700MHzBandPlan.pdf> (last visited Jan. 23, 2023).

<sup>63</sup> *Id.*

<sup>64</sup> *Id.*

<sup>65</sup> See 47 CFR § 2.106.

<sup>66</sup> *Id.* Pursuant to section 27.303 of our rules, operators must submit information about certain operations in the 776-787 MHz band to a public safety coordinator to ensure non-interference with operations in the public safety spectrum, which sits within the Upper 700 MHz band. *Id.* § 27.303.

<sup>67</sup> *Id.* § 2.106 n.NG57.

<sup>68</sup> See *Amendment of Parts 1 and 22 of the Commission's Rules with Regard to the Cellular Service, Including Changes in Licensing of Unserved Area; Amendment of the Commission's Rules with Regard to Relocation of Part 24 to Part 27 et al.*, WT Docket No. 12-40 et al., Second Report and Order, Report and Order, and Second Further Notice of Proposed Rulemaking, 32 FCC Rcd 2518, 2521 at para. 3 (2017) (*800 MHz Second R&O*).

<sup>69</sup> The 800 MHz Cellular band was originally divided into two sets of two 10 megahertz blocks (Block A and Block B). *An Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems*, CC Docket No. 79-318, Report and Order, 86 F.C.C.2d 469 (1981). Later, 10 more megahertz of spectrum was added and divided between Block A and Block B, with the bands being reconfigured to take advantage of this new spectrum. *Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems et al.*, GEN Docket No. 84-1231 et al., Report and Order, 2 FCC Rcd 1825, 1828 at paras. 25-26 (1986).

<sup>70</sup> *800 MHz Second R&O*, 32 FCC Rcd at 2521, para. 3.

<sup>71</sup> 47 CFR § 2.106 n.NG57.

megahertz wide, and the D, E, F, and G<sup>72</sup> blocks are 5 megahertz wide.<sup>73</sup> The band is currently allocated on a primary basis for non-federal fixed and mobile use in the U.S. Table as part of a larger 1850-2000 MHz block.<sup>74</sup> Internationally, the 1930-1970 MHz portion of the band has a secondary mobile-satellite service (Earth-to-space) allocation in Region 2, and the 1980-1995 portion of the band has a primary mobile-satellite service (Earth-to-space) allocation across all regions.<sup>75</sup> Further, in Region 1, the band is allocated to the fixed and mobile services on a co-primary basis, and the ITU has identified much of this band for IMT in all three Regions.<sup>76</sup> There are no federal or secondary allocations for the band,<sup>77</sup> but stations authorized under part 74 of our rules are permitted to operate on a secondary basis in the band.<sup>78</sup>

22. *AWS-H Block.* The Commission's Advanced Wireless Service (AWS) refers to a series of bands licensed under part 27 of our rules.<sup>79</sup> AWS includes the AWS-H Block, a set of paired 5 megahertz sub-bands at 1915-1920 MHz and 1995-2000 MHz.<sup>80</sup> Both sub-bands are allocated in the U.S. Table for non-federal fixed and mobile use on a primary basis, with no federal allocations.<sup>81</sup> Internationally, the lower sub-band's allocation mirrors that of the United States, but the 1995-2000 MHz band is also allocated internationally for mobile-satellite service (Earth-to-space) operations.<sup>82</sup>

23. *WCS.* The 2.3 GHz Wireless Communications Service (WCS) band spans 2305-2320 MHz and 2345-2360 MHz and consists of 2 paired five-megahertz blocks (A and B) and 2 unpaired five-megahertz blocks (C and D).<sup>83</sup> The two segments of the 2.3 GHz WCS band straddle the Satellite Digital Audio Radio Service (SDARS), which is located at 2320-2345 MHz.<sup>84</sup> The Lower A Block (2305-2310 MHz) is allocated for non-federal fixed, mobile (except aeronautical), and radiolocation on a primary basis.<sup>85</sup> In addition to a prohibition on airborne operations at 2305-2310 MHz, licensees near NASA's Goldstone, CA facility are subject to a coordination requirement.<sup>86</sup> The Lower A Block is also allocated for amateur use on a secondary basis.<sup>87</sup> The remainder of the band is allocated for non-federal fixed,

<sup>72</sup> This spectrum block is the subject of the recent part 25 modification application, waiver request and leasing application jointly filed by SpaceX and T-Mobile. *See* SpaceX and T-Mobile Application.

<sup>73</sup> *See FCC Broadband PCS Band Plan*, <https://www.fcc.gov/sites/default/files/wireless/auctions/data/bandplans/pcsband.pdf> (last visited Jan. 23, 2023).

<sup>74</sup> *See* 47 CFR § 2.106.

<sup>75</sup> *Id.*

<sup>76</sup> *See id.* § 2.106 nn.5.384A, 5.388 & 5.388A.

<sup>77</sup> *Id.*

<sup>78</sup> *Id.* § 2.106 n.NG159.

<sup>79</sup> 47 CFR part 27.

<sup>80</sup> *See, H Block Band Plan*, available at <https://www.fcc.gov/sites/default/files/wireless/auctions/data/bandplans/HBlockBandPlan.pdf> (last visited: March 13, 2023).

<sup>81</sup> 47 CFR § 2.106.

<sup>82</sup> *Id.*

<sup>83</sup> *See Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band*, WT Docket No. 07-293, Order on Reconsideration, 27 FCC Rcd 13651, 13654-55 (2012).

<sup>84</sup> *Id.*

<sup>85</sup> *See* 47 CFR § 2.106. Note that, pursuant to n.US97, space-to-Earth operations are currently prohibited.

<sup>86</sup> *Id.*

<sup>87</sup> *See id.* § 2.106.

mobile, broadcasting-satellite (sound), and radiolocation use on a primary basis, and federal aeronautical telemetry/telecommand operations are permitted on a secondary basis.<sup>88</sup> However, to protect adjacent SDARS operations, mobile operations are prohibited in the C Block (2315-2320 MHz) and D Block (2345-2350 MHz).<sup>89</sup> Internationally, for Regions 2 and 3, the WCS band is allocated for fixed, mobile, and radiolocation uses on a primary basis, and amateur uses on a secondary basis.<sup>90</sup> In Region 1, the band is allocated to the fixed and mobile service on a co-primary basis, and radiolocation and amateur use on a secondary basis. Further, the ITU has identified much of this band for IMT in all three Regions.<sup>91</sup>

### III. DISCUSSION

24. The Commission has a longstanding commitment to ensuring that the country's scarce and valuable spectrum resource is put to its highest and best use. Technological innovation and creative applications can pave the way for new spectrum use cases that promote spectrum efficiencies and serve the public interest. In this Notice of Proposed Rulemaking (Notice), we propose a novel framework for SCS<sup>92</sup> that would provide coverage to a terrestrial mobile service licensee's subscribers operating in underserved and/or unserved areas within a terrestrial mobile service licensee's license area, only through a collaboration between an existing NGSO operator and a terrestrial mobile service licensee, involving transmissions between space stations and mobile end-user devices on spectrum that is currently allocated and licensed exclusively on a terrestrial basis.<sup>93</sup> Specifically, given the complexity of this undertaking, and particularly due to technical considerations, we confine our initial proposal to spectrum and locations where (1) there is only a single terrestrial entity that holds, either directly or indirectly, all co-channel licenses for the relevant frequencies in a given geographically independent area (GIA),<sup>94</sup> such as CONUS; and (2) there are no primary, non-flexible-use legacy incumbent operations (whether federal or non-federal) in the band.<sup>95</sup> As discussed below, we also seek comment on potentially extending our proposed framework to a range of alternative licensing scenarios that do not currently meet our proposed entry criteria, including instances where multiple co-channel terrestrial licensees are authorized in a given GIA.

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<sup>88</sup> *Id.*

<sup>89</sup> *See id.* § 27.50(a) (limiting operations in the C and D blocks of the band to fixed use only).

<sup>90</sup> *See id.* § 2.106.

<sup>91</sup> *Id.* § 2.106 n.NG72.

<sup>92</sup> Commenters generally support the Commission's initiation of a rulemaking on this issue. *See, e.g.,* Letter from Alison Minea, Vice President and Associate General Counsel, DISH Network Corporation, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, at 1 (filed Mar. 8, 2023) and Letter from Alison Minea, Vice President and Associate General Counsel, DISH Network Corporation, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, at 1 (filed Mar. 9, 2023) (expressing support for the initiation of a rulemaking to explore a new regulatory framework to facilitate the integration of satellite and terrestrial networks); Letter from Robert Vitanza, Assistant Vice President, Senior Legal Counsel, AT&T Services, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, IB Docket No. 22-271, at 1 (filed Mar. 9, 2023) (AT&T *Ex Parte* Letter) (expressing support for efforts to allow terrestrial mobile networks to integrate SCS through collaboration with a satellite operator); Letter from Jameson Dempsey, Principal, Satellite Policy, SpaceX, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, IB Docket No. 22-271, at 1 (filed Mar. 8, 2023) (SpaceX *Ex Parte* Letter) (expressing support for the draft Notice that would enable satellite connectivity over licensed terrestrial mobile spectrum for SCS).

<sup>93</sup> We note that our proposed framework does not make proposals regarding, or seek comment on, the issue of satellite service to airborne devices, e.g., handsets in any type of aircraft, from commercial airlines to unmanned aircraft systems, nor does it address transmissions originating from high altitude platforms.

<sup>94</sup> *See infra* paras. 44-46.

<sup>95</sup> We do not propose to treat non-flexible-use secondary licensees as incumbents, given that these licensees may not cause interference and must accept all interference. We therefore propose to include within the SCS framework bands that have at least one block in a given GIA where a single terrestrial licensee holds all co-channel licenses, even where that band might contain such secondary licensees.

This proposed framework would be subject to the United States' international treaty obligations, including those under the auspices of the ITU.<sup>96</sup>

**A. Adding a Co-Primary Mobile-Satellite Service Allocation to Certain Bands Allocated to Terrestrial Services**

25. We propose to modify the U.S. Table to authorize mobile-satellite service (space-to-Earth and Earth-to-space) operations in certain terrestrial bands that have no primary, federal or non-federal satellite allocations to permit supplemental coverage from space to the subscribers of the relevant terrestrial networks using those bands. Adding such allocations as co-primary to certain terrestrial “flexible-use” bands<sup>97</sup> would enhance the Commission’s efforts to provide ubiquitous coverage across the United States, including in areas that are currently unserved or underserved. Our proposal could also create significant public safety benefits, including rural service and emergency coverage in areas that terrestrial networks do not reach. In addition, we believe that our proposal to permit use of these flexible-use bands for supplemental coverage from space to close coverage gaps in terrestrial service would serve the public interest by enabling more intensive spectrum use and would be consistent with our goals to allocate increasingly scarce spectrum resources in the most efficient and effective manner possible. As discussed further below,<sup>98</sup> any proposed allocation would remain subject to the United States’ international obligations under treaties, bilateral or multilateral agreements, the International Table, and other instruments of the ITU.

**1. Addition of Mobile-Satellite Service Allocation**

26. *Mobile Satellite Footnote Allocation.* We propose to add the following non-federal footnote<sup>99</sup> to the U.S. Table authorizing mobile-satellite service operations on a co-primary basis<sup>100</sup> with existing allocations in a number of terrestrial flexible-use bands. Specifically, we propose to add the footnote allocation in bands where we are aware of at least one block of the band with an incumbent terrestrial licensee that holds all co-channel licenses throughout a GIA, sufficient to satisfy our proposed entry criteria.

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<sup>96</sup> For example, Article I of the ITU Radio Regulations provides definitions of “space station” and “earth station” that are repeated in our Part 25 rules. Under those definitions, the provision of SCS capabilities would involve the use of space stations and earth stations authorized under part 25 of the Commission’s rules. When a handset is intended for communications with a space station, it becomes an earth station subject to rules governing earth stations. ITU Radio Regulations § 1.63 (“*earth station*: A station located either on the Earth’s surface or within the major portion of the Earth’s atmosphere and intended for communication: with one or more space stations; or with one or more stations of the same kind by means of one or more reflecting satellites or other objects in space.”); ITU Radio Regulations § 1.64 (“*space station*: A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth’s atmosphere.”). See also 47 CFR § 25.103.

<sup>97</sup> The term “flexible-use spectrum” or “flexible-use bands,” refers to services or spectrum bands for which the Commission’s rules do not prescribe specific uses or applications. See *Spectrum Rules and Policies for the Operation of Unmanned Aircraft Systems*, WT Docket 22-232, Notice of Proposed Rulemaking, 2023 WL 120684, \*40, para. 111 n.247 (2023).

<sup>98</sup> See *infra* Section III.C.

<sup>99</sup> Non-federal footnotes consist of the letters “NG” followed by one or more digits and denote a stipulation applicable only to non-Federal operations. They only appear in the non-federal portion of the U.S. Table. 47 CFR § 2.105(d)(5)(iii).

<sup>100</sup> Where there is no international MSS allocation in a band, proposed SCS operations discussed below would be on a co-primary basis domestically, but assignment of such SCS authorizations will be expressly conditioned not to cause harmful interference to, or claim protection from harmful interference caused by, a station operating in accordance with the provisions of the ITU Radio Regulations internationally. See ITU Radio Regulations Article 4.4, Edition of 2020. We note that the 1980-1995 MHz segment of the PCS band has an existing primary MSS (Earth-to-space) allocation across all regions. See 47 CFR § 2.106.

NG33A The bands 614-652 MHz and 663-758 MHz, 775 MHz-788 MHz, and 805-806 MHz, 824-849 MHz and 869-894 MHz, 1850-1920 MHz and 1930-2000 MHz, and 2305-2320 MHz and 2345-2360 MHz are allocated to the mobile-satellite service (MSS) on a co-primary basis. MSS operations in these frequency bands are subject to the Commission's rules for Supplemental Coverage from Space set forth in part 25 of this chapter.

This footnote allocation—which would indicate that bidirectional mobile-satellite service operations (space-to-Earth and Earth-to-space) apply to the provision of SCS—would be added for the entire spectrum range of each listed band. Under this proposal, the footnote would be used in each relevant band in lieu of adding a mobile-satellite service listing (i.e., a “direct table entry”). As discussed below, this proposed allocation would not directly authorize bidirectional mobile-satellite service, and any SCS operations would be subject to compliance with our licensing rules and the relevant band's service rules that might limit use of a spectrum block to uplink or downlink. We seek comment on this approach, including on whether the footnote should be more restrictive and specifically authorize transmission in one direction (space-to-Earth or Earth-to-space) in certain terrestrial bands where our technical rules currently include such a limitation, or where other factors such as adjacent band compatibility would necessitate such a restriction. We also seek comment on whether the proposed footnote allocation should be on a secondary basis as opposed to a co-primary basis.

27. We clarify that some spectrum blocks within a proposed band for the new MSS allocation may not currently meet the proposed entry criteria and licensing requirements discussed further below, but note that evolving technologies, issuance of new licenses, and future secondary market transactions may result over time in an increased number of entities and spectrum blocks eligible to provide SCS under our proposed framework. Thus, we believe it would be administratively efficient to apply a footnote allocation, tied to meeting specific entry criteria and licensing rules, that would minimize the need for future allocation rulemakings as eligibility under the framework is subsequently achieved. We emphasize that, despite the proposed broader allocation, we propose to license operations under our initial SCS framework only for spectrum blocks where applicants can meet our entry criteria and licensing requirements. We seek comment on this proposal, including its costs and benefits. Further, we intend to direct the Wireless Telecommunications Bureau (WTB) and IB<sup>101</sup> to jointly maintain and periodically update a Commission web page providing a list of entities, GIAs, and spectrum bands/blocks that meet our entry criteria if adopted and that become authorized to provide SCS.

28. In the interest of exploring a wide variety of approaches, we also seek comment on adding direct allocations to the U.S. Table for the mobile-satellite service on a co-primary basis in the applicable bands and creating an associated footnote that would limit such use to SCS operations. Are there any benefits to this approach as opposed to employing the more narrowly tailored footnote allocation approach proposed above? If we add direct allocations, is a designation of co-primary use sufficient?

29. The flexible-use terrestrial bands for which we propose at this time to add a non-federal mobile-satellite service footnote allocation are:

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<sup>101</sup> In January 2023, the Commission released an order approving the reorganization of the International Bureau into: (1) a Space Bureau to handle policy and licensing matters related to satellite communications and other in-space activities under the Commission's jurisdiction; and (2) an Office of International Affairs to handle issues involving foreign and international regulatory authorities, as well as international telecommunications and submarine cable licensing. See *Establishment of the Space Bureau and the Office of International Affairs and Reorganization of the Consumer and Governmental Affairs Bureau and the Office of the Managing Director*, MD Docket No. 23-12, FCC 23-1 (2023). The reorganization will not become effective until the appropriate clearance has been obtained, and the order has been published in the Federal Register. See *id.* at para. 25. Post-reorganization, IB will cease to exist, and the Space Bureau would handle, along with WTB, the proposed web page updates as well as the evaluation and coordination of the processing of any SCS applications.

- 600 MHz: 614-652 MHz and 663-698 MHz;<sup>102</sup>
- 700 MHz: 698-758 MHz, 775 MHz-788 MHz, and 805-806 MHz;
- 800 MHz: 824-849 MHz and 869-894 MHz;
- Broadband PCS: 1850-1915 MHz and 1930-1995 MHz;
- AWS-H Block: 1915-1920 MHz and 1995-2000 MHz; and
- WCS: 2305-2320 MHz and 2345-2360 MHz

We believe these flexible-use terrestrial bands can benefit from provision of SCS because commercial wireless services have been deployed on these bands and because the bands include at least one spectrum block with an existing licensee that holds rights sufficient to provide the basis for a satellite applicant to satisfy our proposed entry criteria. We seek comment on the inclusion of each band (or block within a band) in our proposed framework. We also seek comment generally on this approach and any alternative methods of selecting bands that may be better suited to achieving the Commission's goals as set forth in this Notice, or any additional bands that commenters believe should be included in our proposal, for example, certain bands dedicated to public safety use.<sup>103</sup> As stated, these bands were selected because of the presence today of an existing licensee with exclusive rights to a frequency block throughout an entire GIA. However, in light of our proposed entry criteria, which would require an applicant for SCS operation to show evidence of a pending lease application with such a terrestrial entity, is this an appropriate basis upon which to limit the bands to which the new allocation would be applied, or should some other method be used?

30. *Use of Fixed Devices within MSS.* The primary focus of this proceeding is to foster collaborative efforts to enable satellites to fill mobile service coverage gaps on terrestrial spectrum, and for that reason we propose to add a mobile-satellite service footnote allocation to these terrestrial bands. We note, however, that the Commission has previously adopted a flexible-use approach to many of these bands, with current allocations allowing terrestrial service to fixed or mobile devices. Accordingly, we seek comment on whether we should adopt a footnote allocation that would permit mobile satellite use to communicate with fixed, as well as mobile, devices.<sup>104</sup> Would permitting fixed devices to be used within the MSS allocation be consistent with our past flexible-use approach and our goals in this proceeding, for example, by enabling a wider array of IoT devices<sup>105</sup> and customer premises equipment (CPE) to operate in unserved areas? Are there any technical concerns with enabling mobile supplemental satellite operations to communicate with fixed devices in these bands?

31. *Fixed-Satellite Service.* In addition, we note that current satellite services offer some flexibility of use and operation. For example, in certain cases, FSS operators are permitted to provide service to earth stations in motion (ESIM). Similarly, a single satellite constellation can be licensed to provide both FSS and MSS. Thus, we seek comment on whether we should expressly include an allocation for the proposed bands authorizing FSS operations in an SCS context or whether, as proposed, we should only adopt an MSS allocation for those bands. Given the goal of allowing SCS to seamlessly complement terrestrial operations in these bands, what allocation and service rule changes would facilitate this goal without unnecessarily disrupting reliable terrestrial services? We seek comment on the

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<sup>102</sup> As discussed below, we exclude from this allocation the 600 MHz duplex gap at 652-663 MHz. *See infra* para 34, note 108.

<sup>103</sup> *See infra* para. 35.

<sup>104</sup> *See* 47 CFR § 2.106 n.US320 (permitting links with "earth stations at fixed locations" in certain mobile-satellite service bands).

<sup>105</sup> As noted, on February 7, 2023, T-Mobile/SpaceX jointly requested various types of Commission relief to provide a satellite service on terrestrial spectrum that is intended to service consumer handsets and also IoT devices. *See* SpaceX and T-Mobile Application. We note that certain IoT devices may be attached to fixed equipment to monitor utilities or critical infrastructure.

implications of our allocation proposal and whether a different allocation/service rules approach might better serve our goal. What are the costs and benefits of each approach?

32. *Bi-Directional Allocation.* As discussed, we propose a bi-directional footnote allocation to the U.S. Table, and applicants seeking authorization for specific frequencies would be required to comply with our current service rules in conjunction with the implementation of SCS to expand terrestrial coverage. Accordingly, we do not find it necessary to specify in the mobile-satellite service footnote allocation those bands that may be used for uplink or downlink operations, or those bands that may utilize Time-Division Duplexing (TDD) or Frequency-Division Duplexing (FDD) operations.<sup>106</sup> In certain instances, technical practicalities as reflected in applicable service rules may limit use of certain frequencies to uplink only or downlink only,<sup>107</sup> and prospective licensees would need to configure SCS operations to comply with these restrictions. Further, adjacent band compatibility requirements may also result in the need for additional restrictions. We seek comment on this approach, including associated costs and benefits.

## 2. Further Discussion of Bands Proposed for Supplemental Coverage from Space

33. As a threshold matter, SCS operators would be required to protect adjacent band and cross-border operations to the same extent required today under current rules for terrestrial use. In this proceeding, we seek to facilitate SCS through operations that are fully capable of complying with current technical rules and restrictions intended to prevent harmful interference. We do not seek to modify current, long-standing and carefully considered protection requirements. We seek comment on this approach below in the technical section of this Notice, and on whether there are alternatives to ensure that any SCS offerings in these terrestrially allocated bands preserve the spectrum landscape to prevent harmful interference. We also seek comment on whether new adjacent band and cross-border operation protections are required to prevent harmful interference.

34. We propose to allow SCS in the 600 MHz band, excluding the duplex gap,<sup>108</sup> which is allocated on a primary basis for non-federal fixed and mobile operations. We note, however, that radio astronomy operations exist immediately below the 600 MHz band on TV channel 37 (608-614 MHz)<sup>109</sup> and could be susceptible to interference from satellite downlink operations unless the SCS operator fully coordinates with the geographically distributed radio astronomy operations. Below, we separately discuss and seek comment on the potential impact of SCS on radio astronomy.<sup>110</sup> In addition, the 600 MHz band

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<sup>106</sup> Time-Division Duplexing is a radio communications technique where uplink and downlink communications are duplexed by time, such that they share the same channel to communicate back and forth in orthogonal time slots. Frequency-Division Duplexing is a radio communication technique where uplink and downlink communications are duplexed by frequency, such that transmissions are sent on separate designated frequencies (e.g., base station frequencies for downlink versus mobile station frequencies for uplink).

<sup>107</sup> Below we seek comment on expansion of our proposed framework to areas other than an entire GIA, including considerations of how to avoid co-channel interference where multiple licensees exist in a given area where SCS is sought by one or many such licensees. *See infra* Section D.

<sup>108</sup> The duplex gap (which comprises 11 megahertz between the uplink and downlink sections of the 600 MHz band) hosts licensed and unlicensed wireless microphone operations. *See generally Promoting Spectrum Access for Wireless Microphone Operations; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket Nos. 14-166 and 12-268, Report and Order, 30 FCC Rcd 8739 (2015); *Promoting Spectrum Access for Wireless Microphone Operations; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket Nos. 14-166 and 12-268, Order on Reconsideration and Further Notice of Proposed Rulemaking, 32 FCC Rcd 6077, 6080-81, para. 4 (2017).

<sup>109</sup> *See* 47 CFR § 2.106 n.US74; 47 CFR § 27.1321.

<sup>110</sup> *See infra* paras. 123-126.



service rules specify particular frequencies for uplink (663-698 MHz) and downlink (617-652 MHz).<sup>111</sup> Under our proposal, SCS operations would need to be similarly configured to comply with part 27 service rules, notwithstanding the footnote allocating a full frequency range in a band for bi-directional operations.

35. We propose to authorize SCS in the 700 MHz band, which is allocated on a primary basis for fixed, mobile, and broadcasting operations, and in the Broadband PCS band, which is allocated on a primary basis for non-federal fixed and mobile use. While neither the 700 MHz band nor the Broadband PCS band hosts federal allocations, the immediately adjacent 1780-1850 MHz band hosts Federal fixed, mobile, and space operation allocations and extensive Federal uses, and the near adjacent 2025-2110 MHz band hosts Federal fixed, mobile, space operation, space research, and Earth exploration-satellite allocations and numerous Federal uses. We further note that substantial commercial wireless operations exist in each these bands and there are no non-flexible-use legacy incumbent operations but, as with the 600 MHz band, we recognize that licensees may be limited in the selection of uplink and downlink frequencies to satisfy band-specific service rule requirements. We seek comment on the extent to which satellite and terrestrial partners can provide SCS in these bands while complying with applicable terrestrial service rules designed to prevent harmful interference. In addition, we seek comment on whether to include within the SCS framework 700 MHz spectrum that is not currently licensed for commercial use to serve consumer handsets, but that is used to provide public safety benefits. For example, as some commenters suggest,<sup>112</sup> should we include 700 MHz public safety spectrum licensed to FirstNet on a nationwide basis?<sup>113</sup> What are the costs and benefits, including any statutory, technical or regulatory challenges, of applying the SCS framework to FirstNet's 700 MHz public safety spectrum? Could inclusion of FirstNet's 700 MHz spectrum within the SCS framework provide broadband connectivity to first responders without increasing the potential for harmful interference? What specific changes to our rules would be needed to incorporate this spectrum into the proposed SCS framework?

36. We also propose to authorize SCS in the AWS-H block, which hosts terrestrial fixed and mobile allocations. As discussed above, although we propose a bi-directional footnote allocation to the U.S. Table, applicants seeking authorization for specific frequencies would be required to comply with our current service rules with regard to their network design, which may conflict with certain international allocations.<sup>114</sup> For example, we note that, as with other bands, our AWS service rules specify frequencies available for uplink and downlink.<sup>115</sup> Although the 1995-2000 MHz portion of the AWS-H block is specified for downlink operations in our service rules,<sup>116</sup> this band hosts an allocation in the International

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<sup>111</sup> See 47 CFR § 27.11(k).

<sup>112</sup> See Letter from Tim Bransford and Denise Wood, Morgan, Lewis & Bockius LLP, Counsel to AST SpaceMobile, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, at 6-7 (filed Mar. 3, 2023) (AST Mar. 3 *Ex Parte* Letter); Letter from Tim Bransford and Denise Wood, Morgan, Lewis & Bockius LLP, Counsel to AST SpaceMobile, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, IB Docket No. 22-271, at 2 (filed Mar. 8, 2023); Letter from Tim Bransford and Denise Wood, Morgan, Lewis & Bockius LLP, Counsel to AST SpaceMobile, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, IB Docket No. 22-271, at 1-2 (filed Mar. 9, 2023); AT&T *Ex Parte* Letter at 1-2.

<sup>113</sup> The 700 MHz band is allocated for public safety use on 758-775 MHz and 788-805 MHz, with the 758-769 MHz and 788-799 MHz segments licensed to FirstNet. See, e.g., *Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012*, WT Docket No. 06-150, Report and Order, 27 FCC Rcd 10953 (2012) (discussing the reallocation of the 700 MHz D Block for public safety use, the nature of the FirstNet license, and the broadband and narrowband nature of this spectrum); see also 47 CFR § 90.532.

<sup>114</sup> See *supra* para. 32.

<sup>115</sup> See 47 CFR § 27.50(d).

<sup>116</sup> *Id.*

Table for mobile satellite uplink operations.<sup>117</sup> We seek comment on the impact this would have on the deployment of SCS in the AWS-H block.

37. Further, we propose to authorize SCS in the WCS band, which hosts both terrestrial fixed and mobile, as well as satellite broadcasting allocations. The operations in the band are subject to a variety of restrictions to protect adjacent-band operations,<sup>118</sup> including limiting some portions of the band to fixed operations only.<sup>119</sup> The near adjacent 2200-2290 MHz band hosts Federal fixed, mobile, space operation, space research, and Earth exploration-satellite allocations and extensive Federal uses. The adjacent 2360-2395 MHz band hosts Federal mobile (2360-2395 MHz) and radiolocation (2360-2390 MHz) allocations and numerous Federal uses. We seek comment on how to ensure compliance with our service rules for any SCS offering in this band.

38. Finally, we propose to authorize SCS in the 800 MHz Cellular Radiotelephone Service, which is allocated on a primary basis for fixed and land mobile, and which does not have a federal allocation. We recognize, however, that this band was the first established wideband mobile phone band dating back to the 1980s, and therefore existing legacy licensing rules might complicate the provision of SCS intended by terrestrial and satellite partners to provide service in otherwise *unserved* areas in a given GIA. Specifically, unlike most flexible use bands, the 800 MHz cellular service continues to employ a licensing mechanism whereby a licensee's licensed area is essentially the composite of service areas where service in fact *can be* provided, known as a Cellular Geographic Service Area (CGSA). Unlike most commercial spectrum bands, unserved areas beyond the 800 MHz cellular licensee's coverage remain unlicensed in the Commission's spectrum inventory. Provided that an unserved area in a market is at least 50 contiguous square miles in size,<sup>120</sup> an unserved area is available to any applicant through site-based filings that specify the location of base station transmitter(s), either for the current licensee to expand its licensed area or for new entrants seeking to serve the area, and licensees are required to construct new base stations in these areas within one year of grant.<sup>121</sup> Moreover, applications for unserved areas are placed on Public Notice, and competing mutually exclusive applications for an area are accepted and are resolved through competitive bidding under Section 309 of the Act.<sup>122</sup> Cellular licensees also may operate outside of their CGSA on a secondary basis, but such operations receive no interference protection.<sup>123</sup>

39. In sum, the current 800 MHz cellular licensing scheme may present unique challenges for the provision of SCS, which is premised on satellite downlinks covering unserved areas within a terrestrial licensee's authorized service area. Under our proposal, SCS would not be authorized to operate in the 800 MHz cellular service until the terrestrial licensee expands its CGSA to include such adjacent unserved areas, reaches a lease arrangement with a satellite operator to include the newly licensed area, and, with the satellite operator, obtains part 25 authorizations as required under our proposed SCS entry criteria and licensing requirements. The entry of a new 800 MHz co-channel terrestrial licensee entitled to protection from SCS operations in a GIA substantially held by a terrestrial licensee collaborating with a satellite operator would likely present significant technical challenges. We seek comment on how to account for these scenarios and create regulatory flexibility to facilitate SCS where possible. Should we

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<sup>117</sup> See 47 CFR § 2.106.

<sup>118</sup> See *id.* § 27.50(a) (specifying power level, duty cycle, and bandwidth for devices in order to protect SDARs, and prohibiting aeronautical mobile operations to protect NASA operations in Goldstone, CA).

<sup>119</sup> *Id.* (limiting operations in the C and D blocks of the band to fixed use only).

<sup>120</sup> See *id.* §§ 22.911, 22.949.

<sup>121</sup> See *id.* § 22.946.

<sup>122</sup> See 47 U.S.C. § 309(j).

<sup>123</sup> See 47 CFR § 22.912.

permit SCS leasing arrangements with 800 MHz cellular terrestrial partners only where there is less than 50 contiguous square miles of unserved area remaining in a GIA? Alternatively, should SCS operations be permitted in unserved areas within a GIA that are adjacent to a terrestrial partner's licensed area, but only on a secondary basis, similar to current cellular licensees' expansions? Should we permit a cellular licensee to expand its CGSA by using the coverage provided by SCS? We seek comment on all aspects of this issue, including the costs and benefits of any proposed alternatives.

40. *Testing and Future Bands.* To inform our review of the overall record, commenters should indicate the flexible-use bands in which they are currently, or are interested in, testing SCS capabilities.<sup>124</sup> We seek comment on the status of such testing and prospective timelines for each proposed band. We also ask commenters to identify the type of communication contemplated, e.g., voice, SOS/emergency communications, texting, service to IoT devices, 4G/5G broadband, as well as the type of technology or infrastructure needed to support such use.

41. In addition, we seek detailed comment regarding whether there are other flexible-use terrestrial bands, besides those proposed in this Notice, that may be of interest for future SCS operations. What specific additional bands should we consider? Are there bands that might be particularly suited to providing SCS to terrestrial devices beyond consumer handsets, for example, potential SCS to a wider range of IoT devices? For each band, what type of allocation is needed and what, if any, limitations should be established to complement terrestrial operations without causing harmful interference? We ask commenters to identify the types of other operations contemplated, the desired bands, and the technology and infrastructure needed to support such use.

#### **B. Closing Terrestrial Service Area Coverage Gaps Through Supplemental Coverage from Space**

42. We see the potential for achieving significant public interest benefits by facilitating satellite coverage to close terrestrial service coverage gaps using spectrum currently allocated for terrestrial service. We strive to realize these public interest benefits as rapidly as possible, while minimizing the risk of harmful interference. To avoid technical complexities that could arise where SCS is introduced in areas where multiple co-channel terrestrial licensees are present on a particular spectrum block, we propose as an initial step to adopt rules that authorize SCS only in cases where a single terrestrial licensee holds all co-channel licenses on the relevant band in a GIA. Likewise, we propose initially to limit our SCS framework to NGSO operators with an existing part 25 license or an existing part 25 grant of market access (for non-U.S. licensed satellite operators) (together, "authorization"), because such satellite operators are likely to rapidly deploy these space stations after receiving any needed modification to their existing authorizations to implement SCS. We believe that proposing this initial step, while seeking comment on potential expansion of the framework, presents the fewest practical and technical complexities and provides the most efficient path for enabling SCS in the near-term.

43. We recognize, however, that even as we propose to accelerate SCS operations that present less technically complex interference protection scenarios, we do not wish to discourage or delay the development of other innovative solutions for supplemental satellite coverage.<sup>125</sup> We note that, during the pendency of this proceeding, we will continue to consider filings made by interested parties, for example, requests for rule waiver, special temporary authority, and experimental authorization, relating to supplemental satellite coverage proposals, including those that do not meet the initial criteria we propose for SCS. In addition, any action on such applications would be subject to the outcome of this proceeding. We believe that proposing a measured approach permits rapid consideration of innovative solutions in the

<sup>124</sup> See, e.g., AST Mar. 3 *Ex Parte* Letter at 6 (AST states that it is currently testing SCS capabilities on FirstNet spectrum pursuant to a grant of experimental authority issued by OET under call sign WL2XRE).

<sup>125</sup> See Letter from Angela Simpson, Senior Vice President & General Counsel, Competitive Carriers Association, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, IB Docket No. 22-271, at 1-2 (Mar. 9, 2023) (CCA *Ex Parte* Letter); AT&T *Ex Parte* Letter at 1; AST Mar. 3 *Ex Parte* Letter.

dynamic satellite-terrestrial marketplace, while also developing a robust record to consider policies and rules that may ultimately permit expansion to new or other types of satellite entrants collaborating with terrestrial licensees authorized on additional spectrum blocks that do not meet our proposed SCS framework.

### 1. Geographically Independent Area

44. Introducing satellite operations in flexible-use terrestrial spectrum presents novel challenges for managing potential co-channel interference in adjacent markets. For example, in terrestrial wireless services, the Commission typically requires co-channel terrestrial licensees in adjacent markets to comply with a field strength limit at the common boundary of their geographically licensed markets, while permitting such licensees to negotiate a mutually agreeable alternative limit.<sup>126</sup> In proposing to permit satellite operation on spectrum bands currently allocated for terrestrial-only use, we note that our typical field strength limit at the wireless terrestrial service area boundary may not fully reflect the impact of a satellite-transmitted signal on adjacent market areas. This concern stems from differences in interference metrics and mechanics between satellite and terrestrial-based networks, as well as the increased potential for harmful interference caused by satellite signals that may have a larger footprint into an adjacent service area than a terrestrial network's limited operations near service area borders. We note that modeling the field strength at a service area boundary from a static terrestrial base station, while considering terrain losses, antenna tilt, tower height, etc., is a relatively straightforward, verifiable task. Moreover, the strength of a terrestrial transmission into an adjacent market typically drops off quickly the further the signal travels into that market. In contrast, signals from a satellite are subject to free space propagation, have substantially larger footprints, arrive from varying angles, and could change in a dynamic fashion depending on orbital mechanics. Accordingly, a co-channel satellite transmission into an adjacent market is not as likely to drop off in strength as a terrestrial transmission, and is less affected by terrain-based mitigation factors commonly experienced by terrestrial systems. Further, given the inherent constant movement of NGSO satellites, which can affect signal strengths as measured at a given point, the satellite operator may have difficulty ensuring that a signal strength limit applicable to terrestrial networks is not periodically exceeded over time. Finally, we note that an undesired satellite signal into unauthorized markets can also impact terrestrial service in those markets by increasing the noise floor.

45. Therefore, to minimize the possibility for interference between geographically adjacent markets, we propose, as an initial step in this proceeding, to limit the provision of supplemental coverage from space to instances where a single terrestrial licensee holds all co-channel licenses in the relevant band throughout one of six GIAs.<sup>127</sup> The proposed GIAs are: (1) CONUS; (2) Alaska; (3) Hawaii; (4) American Samoa; (5) Puerto Rico/U.S. Virgin Islands; and (6) Guam/Northern Mariana Islands. Notably, there are no Commission licensed land areas adjacent to each proposed GIA, and there is a significant geographic separation between GIAs. By applying these proposed criteria to satellite use of terrestrial spectrum, we seek to ensure that collaborating satellite and terrestrial licensees may provide SCS without the presence in each GIA of co-channel terrestrial licensees requiring interference protection.<sup>128</sup> We seek comment on this proposal, including the associated costs and benefits.

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<sup>126</sup> See, e.g., 47 CFR §§ 24.236, 27.55.

<sup>127</sup> Although we would require a single licensee to hold all relevant co-channel licenses throughout a GIA under our proposed framework, we note that each GIA, depending on the subject band, may consist of a range of different geographic area licenses, e.g., Regional Economic Area Groupings, Economic Area Groupings, Partial Economic Areas, Component Economic Areas, Cellular Market Areas, etc.

<sup>128</sup> We recognize that there may be instances where a single licensee holds all relevant co-channel licenses in a GIA, but has entered into lease arrangements. Although we propose that such a licensee would still qualify to participate in the proposed SCS framework because it holds all relevant co-channel licenses in the GIA, we discuss further below the issue of protections to be afforded to its lessees in this circumstance. See *infra* paras. 111-112.

46. Our initial proposal is intentionally limited in scope in order to enable prompt action, while reducing technical challenges. We recognize, however, that stakeholders may explore solutions to provide SCS in other circumstances, such as in bands with existing non-flexible-use legacy incumbents, whether federal or non-federal. Further, a satellite operator may want to collaborate with multiple terrestrial licensees that collectively hold all co-channel licenses in a GIA. Alternatively, it is possible terrestrial and satellite collaborators may be interested in offering SCS in an area where the terrestrial licensee does not hold all co-channel licenses for the relevant spectrum block throughout the entire GIA, meaning their license areas are adjacent to those of unaffiliated and non-participating licensees that require additional interference protection. Below, we seek comment on a range of possible scenarios involving various licensee configurations and geographic combinations.<sup>129</sup>

## 2. Assigning New Mobile-Satellite Service Rights for Supplemental Coverage from Space

47. Supplementing terrestrial service with coverage from space requires the granting of transmission rights involving two distinct links—the transmission link from a space station to a terrestrial device (downlink/space-to-Earth) and the transmission link from a terrestrial device to a space station (uplink/Earth-to-space), along with the right to receive such transmissions. In the terrestrial licensing context, rights for both links vest in a single licensee; for satellite operations, licenses will typically include both the transmit and receive frequencies for the facilities involved, whether a space station or earth station, and the rights for operations of any such facilities can be held by two different licensees, one for the space station and one for the earth station.

48. *Space Station Operations.* Space stations are licensed through the Commission’s part 25 licensing framework. Terrestrial licensees operating on exclusively held, flexible-use spectrum do not currently have the right to transmit from space stations (or to consent to having a satellite entity make such a transmission on its behalf), except to the extent our rules provide for operations within a particular frequency band in all allocated services. To effectuate SCS in certain flexible-use bands allocated solely for terrestrial use, we propose to authorize mobile satellite operations (downlink/space-to-Earth and uplink/Earth-to-space) in these bands (when newly allocated for such use) by allowing an NGSO satellite operator with an existing part 25 authorization to apply to modify such authorization where that entity meets certain prerequisites, or “entry criteria.” Specifically, we propose that such a licensee may apply to modify its part 25 authorization only if it has: (1) an application on file with the Commission to lease the exclusive-use spectrum throughout an entire GIA, allocated for MSS provision of SCS, of a terrestrial licensee that holds all co-channel licenses, either directly or indirectly, throughout the GIA; (2) a current part 25 space station license or part 25 grant of market access for NGSO satellite operation sufficient to cover the leased GIA; and (3) proof of an application on file from the satellite operator’s terrestrial partner for a part 25 blanket earth station license covering all of its subscribers’ terrestrial devices that will be transmitting and receiving from the space station in conjunction with the provision of SCS. Are these the correct entry criteria to serve as prerequisites for the provision of SCS? We seek specific comment on these criteria and whether other criteria would be better suited to facilitate SCS. Given the required nexus of one satellite operator collaborating with one terrestrial licensee, as discussed further below, our proposed framework precludes the possibility of the filing of mutually exclusive applications that would implicate the competitive bidding provisions of section 309(j)(1) of the Act.<sup>130</sup>

49. Under our proposed framework, meeting certain entry criteria would allow an entity to apply to modify its existing satellite authorization. We propose that this modification application (using FCC Form 312, Main Form and Schedule S) include a comprehensive proposal for each space station in the applicant’s SCS system, together with applicable certifications regarding related pending SCS applications. We further propose that applications that are acceptable for filing be placed on public notice

<sup>129</sup> See *infra* Section D.

<sup>130</sup> 47 U.S.C. § 309(j)(1); see *infra* para. 60.

to provide interested parties an opportunity to file pleadings in response to the application. We clarify that *all* related SCS applications—modification application or request for modification of a grant of market access, lease application, and blanket earth station application—must first be granted before a satellite and terrestrial operator can provide supplemental coverage from space. As discussed in detail below, we seek comment on our proposed approach, including the associated costs and benefits. Is there specific technical or other information that should be requested from applicants seeking a modification of a space station authorization to provide SCS? Are these the correct licensing requirements to apply for authorization to provide SCS or would other, or additional, criteria be more appropriate? Commenters are requested to provide specific support for any alternative approaches.

50. We intend to direct WTB and IB to evaluate and coordinate simultaneous processing of all applications required to be filed under our proposed entry criteria if adopted. We note that the bands we initially include in the proposed framework do not conform to the International Table.<sup>131</sup> Given this non-conformance, we propose to modify section 25.112(a)(3) of our rules to permit the filing of applications notwithstanding the non-conformance.<sup>132</sup> We seek comment on this approach, including the associated costs and benefits.

51. We seek comment as to whether an SCS framework should permit the filing of applications from licensees holding authorizations for geostationary satellite orbit (GSO)<sup>133</sup> operation. Is the provision of SCS feasible from a space station in geostationary orbit and, if so, are the considerations to facilitate such capabilities different than for NGSO systems? What are those differences and how should we address them in our policy framework and rules? What benefits and limitations are presented by providing SCS via NGSO versus GSO space stations? Further, we seek comment on what part 25 rule amendments are necessary to reflect our proposed eligibility limitations placed on applicants seeking authority to provide SCS. For example, should we amend Commission rule sections 25.156, 25.157, or 25.158, or other relevant rules, to reflect our proposed entry criteria, or should we adopt a new rule section?<sup>134</sup>

52. We expect that satellite operators, working in collaboration with terrestrial licensees, will be able to deploy SCS to rapidly fill coverage gaps that are challenging and costly for the terrestrial licensee to serve. We recognize that our existing regulatory terrestrial licensing framework protects exclusive-use spectrum rights, which typically are acquired through competitive bidding or secondary market transactions. We believe it would not serve the public interest to propose to allow, absent a

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<sup>131</sup> We note that any such use would be on a non-interference basis only, and “shall not cause harmful interference to, claim protection from harmful interference caused by a station operating in accordance with the provisions of the [ITU] Constitution, the Convention and these Regulations.” ITU Radio Regulations Article 4.4, Edition of 2020.

<sup>132</sup> Pursuant to current section 25.112 of the Commission’s rules, with some exemptions, an application requesting authority to operate a satellite in a frequency band that is not allocated internationally for such operation under the ITU Radio Regulations is deemed unacceptable for filing regardless of whether a waiver of the Table of Frequency Allocations is requested. *See* 47 CFR § 25.112(a)(3), (b). In an effort to expedite the processing of satellite and earth station applications, the Commission has proposed to streamline the acceptability for filing of satellite applications by removing section 25.112(a)(3) in its entirety and providing guidance on waiver requests for satellite operations not in conformance with the International Table so as to be accepted for filing. *See Expediting Initial Processing of Satellite and Earth Station Applications*, IB Docket No. 22-411, *Space Innovation*, IB Docket No. 22-271, Notice of Proposed Rulemaking, FCC 22-95 (Dec. 22, 2022). In that NPRM, the Commission also sought comment on other revisions to part 25 of its rules intended to facilitate acceptability for the filing of satellite applications. To the extent the Commission takes action to remove section 25.112(a)(3) in IB Docket No. 22-411 before the Commission takes action on SCS proposed herein, the proposal here to modify Section 25.112(a)(3) will be moot.

<sup>133</sup> *See* 47 CFR § 25.103. A geostationary-orbit satellite is a geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth’s equator and remains approximately fixed relative to the Earth.

<sup>134</sup> *See id.* §§ 25.156, 25.157, 25.158.

collaboration with a terrestrial licensee, a satellite operator to apply for, and be granted, an independent part 25 co-channel authorization to use spectrum for SCS that is already exclusively licensed to a terrestrial licensee.<sup>135</sup> Instead, we believe a part 25 license, necessarily coupled with a lease between a terrestrial licensee and satellite operator, is a readily available means for authorizing SCS on a terrestrial licensee's exclusive-use spectrum. Under our proposed framework, a lease arrangement would also serve as a means of expressing a terrestrial licensee's consent to the satellite operator's use of the terrestrial licensee's exclusively held spectrum usage rights.

53. Our proposal to authorize SCS via the combination of a lease coupled with a part 25 authorization for transmissions to and from a terrestrial device and a space station seeks to leverage the Commission's long-established leasing regime under part 1 of our rules consistent with section 310(d) of the Communications Act of 1934, as amended. We note that our secondary markets rules provide for flexibility in leasing arrangements.<sup>136</sup> In a spectrum manager lease arrangement, the licensee retains both *de facto* and *de jure* control of the license.<sup>137</sup> In a *de facto* spectrum lease arrangement, the licensee retains *de jure* control of its license, while *de facto* control of the leased spectrum is transferred to the lessee.<sup>138</sup> As the Commission explained when it adopted the *de facto* leasing rule, "[t]he lease does not involve a complete and permanent transfer of control, and the licensee retains *de jure* control of the license as well as some degree of actual control, such that it retains some responsibility to the Commission for operations on spectrum encompassed within its license."<sup>139</sup> Thus, we propose to require the satellite operator's use of a terrestrial licensee's exclusive-use spectrum to be subject to a lease arrangement with that terrestrial licensee, coupled with the satellite operator's part 25 authorization. We seek comment on this proposal, including any associated costs and benefits. Given the collaboration required by our proposed entry criteria, are there specific legal considerations that need to be addressed if transmission rights to and from a terrestrial device are assigned to more than one entity? For example, which entity would be the responsible party if there are instances of harmful interference from a satellite transmission or from a terrestrial device (licensed as an earth station) transmission? In such cases, would both licensees—earth station and space station—be jointly liable or only one of the licensees?

54. In the alternative, we seek comment on a similar entry criterion where the satellite operator, in lieu of a leasing arrangement pursuant to part 1 of the Commission's rules, has an operating agreement with a terrestrial licensee holding all necessary geographic area co-channel licenses. Unlike the Commission's part 1 leasing regime, which requires the parties to seek Commission approval of a leasing arrangement, by filing an FCC Form 608 containing a description of the underlying lease, among other things, the Commission does not review or approve satellite operating agreements. We note that such operating agreements are typical in the satellite context for use of spectrum allocated and licensed for space radiocommunication services, and seek comment on whether such agreements would be an appropriate alternative to leasing arrangements, provided the parties are able to comply with section 310(d) of the Act.<sup>140</sup> Would other contractual arrangements be preferable for achieving the Commission's goals in this context? What are the costs and benefits of any alternative approaches?

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<sup>135</sup> See *id.* § 1.934(e)(1) (providing that the Commission may dismiss applications that request spectrum which is unavailable because "[i]t was previously assigned to another licensee on an exclusive basis").

<sup>136</sup> *Id.* § 1.9003.

<sup>137</sup> *Id.*

<sup>138</sup> *Id.*

<sup>139</sup> *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, WT Docket No. 00-230, Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 20604, 20664, para. 136 (2003) (*Secondary Markets R&O*).

<sup>140</sup> 47 U.S.C. § 310(d).

55. We also seek comment on other approaches for satellite operators to seek such authority particularly related to the timing for acquiring such rights. For example, should we permit an existing satellite operator with a part 25 space station authorization to apply to modify its authorization without first having identified a terrestrial licensee partner, provided we condition any future satellite operation to provide SCS on reaching a subsequent lease or other contractual arrangement with a terrestrial licensee? Would such a process encourage investment and enable rapid provisioning of services when a lease or other contractual arrangement is in place, or increase interest in providing SCS? Alternatively, would it potentially result in an uneven playing field or adversely impact negotiating incentives among interested parties, as a terrestrial licensee's choice of satellite operator partner would necessarily be limited?

56. *New Satellite Entrants.* Further, although we limit our initial proposal to modifications of existing NGSO satellite authorizations, we seek comment in the alternative on other approaches that might permit new satellite entrants to participate in this framework. Should we modify our proposed framework to include new satellite entrants seeking to provide SCS in collaboration with a terrestrial partner? Allowing new satellite entrants would allow interested terrestrial operators to apply for an NGSO space station constellation authorization to provide SCS and enhance existing network coverage. Would such an approach increase flexibility, foster increased stakeholder interest in providing SCS, and facilitate near-term deployments to close terrestrial coverage gaps in the public interest? Are there sufficient economic incentives for new entrants seeking to offer SCS in collaboration with a terrestrial partner? What are the costs and benefits of permitting new entrants to participate in the provision of SCS?

57. If we determine that new satellite entrants should be permitted in an SCS framework, what changes would be necessary to our current part 25 authorization processes? We note that our current part 25 rules for authorizing new NGSO systems typically involve a processing round procedure where applicants for licenses or petitioners for U.S. market access are considered in groups based on frequencies requested and filing date.<sup>141</sup> Pursuant to the Commission's rules, a license application for "NGSO-like"<sup>142</sup> satellite operation that satisfies the acceptability for filing requirements<sup>143</sup> is reviewed to determine whether it is a "competing application" or a "lead application."<sup>144</sup> Lead applications are placed on public notice, which initiates a processing round, establishes a cut-off date for competing NGSO-like satellite system applications, and provides interested parties an opportunity to file pleadings in response to the application.<sup>145</sup> The Commission reviews each application in the processing round and all the pleadings filed in response to each application.<sup>146</sup> Based upon this review and consideration of such other matters as it may officially notice, the Commission will grant all the applications for which the Commission finds that (1) the applicant is legally, technically, and otherwise qualified; (2) the proposed facilities and operations comply with all applicable rules, regulations, and policies; and (3) grant of the application will serve the public interest, convenience and necessity.<sup>147</sup> The Commission will deny the other applications.<sup>148</sup> In the event that there is insufficient spectrum in the frequency band to

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<sup>141</sup> See 47 CFR §§ 25.137, 25.157.

<sup>142</sup> The term "NGSO-like satellite operation" is defined as: "(1) Operation of any NGSO satellite system; and (2) Operation of a GSO [geostationary satellite orbit] MSS [mobile-satellite service] satellite to communicate with earth stations with non-directional antennas." *Id.* § 25.157(a).

<sup>143</sup> *Id.* § 25.112.

<sup>144</sup> A competing application is one filed in response to a public notice initiating a processing round; any other application is a lead application. See *id.* §§ 25.156(d)(1), 25.157(c).

<sup>145</sup> *Id.* § 25.157(c)(2). Competing applications are also placed on public notice to provide interested parties an opportunity to file pleadings in response to the application. *Id.* § 25.157(c)(1).

<sup>146</sup> *Id.* § 25.157(d).

<sup>147</sup> *Id.* § 25.156(a).



accommodate all qualified applicants in a processing round, the Commission will typically divide the available spectrum equally among the licensees whose applications were granted.<sup>149</sup>

58. In contrast to the existing part 25 satellite licensing procedures involving processing rounds and opportunities for segmented or shared spectrum bands, the proposed SCS framework would facilitate direct access by an existing satellite operator to a specific terrestrial spectrum band through the combination of a part 25 authorization (for both space and earth stations) and a lease arrangement with a terrestrial licensee. This proposed framework contemplates a one-to-one relationship between parties to jointly operate in an exclusive band, thus precluding the filing of competing applications. Therefore, existing satellite authorization processes may not be well suited for authorizing new entrants seeking to offer SCS. What changes to existing part 25 rules would be necessary to facilitate the receipt and processing of applications for new entrants seeking to provide SCS in collaboration with a terrestrial partner, consistent with our proposed entry criteria that precludes the filing of mutually exclusive applications? For example, do processing rounds serve a meaningful purpose where our proposed framework requires a nexus between a single satellite operator and a single terrestrial licensee, or would adherence to the existing processing rounds procedure create unnecessary complexity without concomitant benefit?

59. *Terrestrial End-User Device Limitation.* At this time, we envision SCS as an enhancement to the provision of existing terrestrial service. This targeted offering directly to the terrestrial licensee-partner's subscribers will facilitate the Commission's immediate goal of closing coverage gaps in terrestrial service, particularly to consumer handsets. For this reason, the proposed framework does not contemplate authorizing a standalone satellite service to specially provisioned satellite-only devices using terrestrial spectrum.<sup>150</sup> Rather, we propose to limit a satellite operator's modified part 25 authorization to build, deploy, and operate a space station to transmit and receive in the terrestrial band for purposes of communications with the terrestrial wireless licensees' subscribers' end user devices that are to be licensed as earth stations for purposes of SCS as described below. We seek comment on this proposal, including the associated costs and benefits. Are any changes to our proposed framework necessary depending on the type of terrestrial device to be served, i.e., consumer handset or IoT device?

60. *Section 309(j)(1) and the ORBIT Act.* We propose to accept applications for SCS authority only where a satellite operator has partnered, through a lease arrangement, with a terrestrial operator holding exclusive-use co-channel spectrum rights in an entire GIA. Our proposed framework precludes the possibility of the filing of mutually exclusive applications and thus would not require competitive bidding under section 309(j)(1) of the Act.<sup>151</sup> We also note that the ORBIT Act expressly prohibits the Commission from "assign[ing] by competitive bidding orbital locations or spectrum used for the provision of international or global satellite communications services."<sup>152</sup> As we do not propose to specifically limit traffic carried by SCS to domestic communications, we believe the ORBIT Act would

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<sup>148</sup> See *id.* § 25.157(d).

<sup>149</sup> *Id.* § 25.157(e)(1).

<sup>150</sup> Considered below is the development of terrestrial devices that may use mobile satellite spectrum as well as separate terrestrial frequencies. See *infra* paras. 149-150.

<sup>151</sup> 47 U.S.C. § 309(j)(1). The Act requires the Commission to consider whether it would be in the public interest "to use engineering solutions, negotiation, threshold qualifications, service regulations, and other means in order to avoid mutual exclusivity in application and licensing proceedings." *Id.* § 309(j)(6)(E); see *M2Z Networks, Inc. v. FCC*, 558 F.3d 554, 563-64 (D.C. Cir. 2009).

<sup>152</sup> 47 U.S.C. § 765(f).

preclude assignment of part 25 licenses for the provision of SCS by competitive bidding.<sup>153</sup> We seek comment on this analysis.

61. *Earth station operations.* In addition to authorizing space station operations, we must also consider the appropriate method for authorizing terrestrial devices communicating with a space station. In this respect, the terrestrial devices would be operating as earth stations in a space radiocommunication service.<sup>154</sup> As discussed below, we propose that a terrestrial licensee seeking to collaborate with a satellite operator to offer SCS must apply for and obtain a blanket earth station license for all of its subscribers' terrestrial devices that will be transmitting to space stations for SCS operations, and we seek comment on this approach and any other approaches that will be consistent with our statutory and international obligations.<sup>155</sup> We also seek comment below on how we can streamline earth station licensing processes and forms for SCS blanket earth station applications to eliminate any undue burden.<sup>156</sup>

62. Our current part 25 rules require an applicant to seek prior authorization before transmitting from an earth station in the United States to FCC-authorized space stations.<sup>157</sup> The earth stations are licensed on either an individual or blanket-license basis. Under a blanket license, earth stations may be deployed anywhere within the geographic area specified in the license without site-specific coordination.<sup>158</sup> An application for transmitting earth station authority must be filed on FCC Form 312, Main Form and include a Schedule B.<sup>159</sup> Earth station applicants must include any certifications, showings, or other information required by section 25.115.<sup>160</sup> If the Commission finds a license application acceptable for filing, it will be placed on public notice.<sup>161</sup> After consideration of any petitions or comments filed on an application, the Commission will grant the application if doing so will serve the public interest, convenience, and necessity.<sup>162</sup>

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<sup>153</sup> See *Northpoint Tech., Ltd. v. FCC*, 412 F.3d 145 (D.C. Cir. 2005).

<sup>154</sup> Under Article I of the ITU Radio Regulations and our rules, an "earth station" is any station located on the earth intended for communications with a "space station." See *supra* para. 24 & n.96. Both the Communications Act (*e.g.*, section 301) and the ITU Radio Regulations (*e.g.*, Art. 18) obligate us to control the use of spectrum and license any transmitting station for the use allowed under the license. See 47 U.S.C. §§ 301, 303; ITU Radio Regulations (R.R.), Art. 18.1. For terrestrial services, operations of all transmitting stations, base stations and mobile stations, are typically authorized in a single license for the terrestrial use allowed under that license; for satellite services, stations in space and on earth are typically licensed separately and the licenses of any such facilities can be held by two different licensees, one for space stations and one for earth stations. Unlike terrestrial base stations, space stations require orbital location and other coordination internationally. See *generally* ITU R.R. Preamble; ITU R.R. Art. 7. See *also supra* para. 48.

<sup>155</sup> See Letter from Steven B. Sharkey, Vice President, Government Affairs Technology and Engineering Policy, T-Mobile, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 23-65, IB Docket No. 22-271, IBFS File No. SAT-MOD-20230207-00021, at 2 (filed Mar. 10, 2023) (T-Mobile *Ex Parte* Letter); SpaceX *Ex Parte* Letter at 2.

<sup>156</sup> See SpaceX *Ex Parte* Letter at 2; T-Mobile *Ex Parte* Letter at 2.

<sup>157</sup> See 47 CFR §§ 25.102(a), 25.115(a)(1)(i).

<sup>158</sup> See *id.* § 25.103 (definition of blanket license); see, *e.g.*, *id.* § 25.115(c)(1), (c)(3), (d), (f)(2), (i) (application provisions for blanket-licensed earth stations).

<sup>159</sup> *Id.* § 25.115(a)(1). A completed Schedule B provides a technical and operational description of the proposed earth station(s), with the quantity and size of antennas to be deployed, antenna gain, power and transmission characteristics, and any frequency coordination and siting information. It may also include the antenna model and manufacturer. See *generally* FCC Form 312 Schedule B.

<sup>160</sup> See 47 CFR § 25.115(a)(1). Earth station applicants must also address human safety and environmental requirements found in other Commission rule parts. See *id.* §§ 25.115(p), (j), 25.271(g).

<sup>161</sup> See *id.* § 25.151.

<sup>162</sup> See *id.* § 25.156(a).

63. Under current rules, an earth station or network of blanket-licensed earth stations must be brought into operation within 12 months after initial licensing, unless a different build-out period is specified by the Commission.<sup>163</sup> An earth station blanket licensee may file a minor modification to its license to add additional remote terminals operating on a primary basis to its blanket license without prior Commission authorization.<sup>164</sup> The blanket earth station licensee must file a notification with the Commission to modify its license to add such remote terminals within 30 days of the modification.<sup>165</sup> As stated, the Commission authorizes space stations separately from earth stations/user terminals. In contrast, under our part 1 Wireless Radio Services (WRS) rules, there is no separate licensing process for the operations of terrestrial base stations versus mobile or fixed station/user terminals, and authority for a licensee's subscribers to operate mobile or fixed stations in the WRS is included in the licensee's authorization.<sup>166</sup>

64. We propose to modify our part 25 rules to require a terrestrial licensee that has partnered with a satellite operator to seek a blanket earth station license for all of its subscribers' terrestrial devices that will operate with space stations, and are otherwise authorized under the terrestrial license.<sup>167</sup> Further, we propose to include such terrestrial devices within our part 25 blanket earth station licensing regime, but seek comment on what portions of that regime are necessary in the context of the proposed framework in this proceeding.<sup>168</sup> Thus, we propose that the terrestrial licensee would file for such authorization using FCC Form 312, Main Form and Schedule B, but seek comment on whether applications that are acceptable for filing should be placed on public notice to provide interested parties an opportunity to file pleadings in response to the application. Is there specific technical or other information that should be requested from applicants seeking a blanket earth station license to provide SCS? To what extent would approval of devices in the equipment certification process render information ordinarily required in a blanket earth station application unnecessary?<sup>169</sup> Would it be necessary to specify in these circumstances the number of units to be covered by the blanket license? To streamline the licensing process, we seek comment on what information currently collected in Schedule B might be eliminated and perhaps be replaced by a certification(s). If a certification approach is adopted, what certifications would be necessary? For example, instead of listing the devices that would be covered, would it be sufficient to require a certification stating that: (1) the earth station applicant meets all SCS requirements; (2) the blanket earth station license will cover all of the current and future subscribers' devices activated in the relevant terrestrial network; and (3) the devices covered by the blanket earth station license have already received equipment authorizations under Commission rules? We believe that the terrestrial licensee is best positioned to seek and hold a blanket earth station license for the provision of SCS for a variety of reasons. Specifically, because SCS is envisioned as an enhancement to terrestrial service and not a standalone satellite service, a terrestrial licensee's subscribers would use the same device for terrestrial service and SCS. Thus, the terrestrial licensee arguably should hold the authorizations for both the terrestrial and SCS uses of the device. In addition, such subscriber devices are already subject to contractual agreements between the terrestrial licensee and subscriber, and we anticipate that terrestrial

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<sup>163</sup> *See id.* § 25.133(a).

<sup>164</sup> *Id.* § 25.118(a).

<sup>165</sup> *Id.*

<sup>166</sup> *Id.* § 1.903(c).

<sup>167</sup> We reiterate that if proposed uplink transmissions do not conform to the International Table, such use would be on a non-interference basis only. ITU Radio Regulations Article 4.4, Edition of 2020.

<sup>168</sup> *See SpaceX Ex Parte Letter at 2.*

<sup>169</sup> *See infra* paras. 128-129 (proposing that SCS devices with existing equipment authorizations not be required to undergo separate part 25 equipment authorization where such devices would not need technical modifications and would not exceed current power levels in the provision of SCS).

licensees would provide SCS capability on subscriber devices under such contracts. We seek comment on our proposal, including the costs and benefits.

65. We also seek comment on whether the terrestrial partner should be required in all cases to hold the part 25 blanket earth station license, or whether we should permit the space station licensee also to hold the earth station license associated with the terrestrial devices, provided other proposed entry criteria are met to give additional flexibility to the parties based on their business needs. Once a terrestrial licensee has a part 25 authorization for earth station operations, should the terrestrial licensee be allowed to lease such rights under our existing leasing regime, or should the part 25 earth station license be treated under current policies that typically involve use of operating agreements in the event a third party seeks to utilize the communications capabilities of earth stations?

66. We also propose that once the terrestrial licensee receives a part 25 blanket earth station license for its subscribers' terrestrial devices, it may avail itself of the minor modification procedures for blanket earth station licenses under part 25 to add additional terrestrial devices without prior Commission approval. We note that the terrestrial licensee will continue to control its subscribers' terrestrial devices, whether they are transmitting to terrestrial base stations or to space stations licensed to a satellite operator. Thus, once the terrestrial licensee has a blanket earth station license for its initial terrestrial devices, we do not find it necessary under the proposed framework to require specific prior authorization to add additional devices to the blanket authorization. We seek comment on this approach. We also seek comment on whether a notification to the Commission to add new terrestrial devices to the terrestrial licensee's blanket license, which is required under the current blanket earth station licensing process, provides administrative or technical benefits under the proposed SCS framework. Should we modify any other aspects of the blanket earth station licensing rules in the context of our proposed SCS framework? Is there an alternative to the blanket earth station licensing approach proposed above that could more efficiently and effectively authorize SCS communications from terrestrial devices consistent with our international obligations and statutory mandates?

67. *License Alienability.* The framework we propose today would require a collaboration between a satellite operator and a terrestrial licensee that holds all relevant co-channel licenses within the GIA. Successful provision of SCS relies on the parties' ability to negotiate adequate technical protections for their collective co-channel operations in potentially overlapping geographic areas within a terrestrial licensee's license area. Accordingly, what limitations, if any, are necessary to place on a satellite operator or terrestrial licensee's ability to assign or transfer its rights under its licenses? Should a terrestrial licensee be prohibited, for example, from assigning, partitioning, or disaggregating rights in any of the licenses that cover a part of the GIA? Should we prohibit a satellite licensee from assigning its part 25 authorization granted solely to provide SCS in conjunction with a specified terrestrial partner? Alternatively, should we adopt a minimum holding period for such licenses (either terrestrial or satellite), and if so, what is the appropriate period and how would the expiration of that period affect the existing satellite-terrestrial arrangement? Commenters should address the costs and benefits of these potential limitations and any other alternatives related to license alienability.

### 3. Leasing

68. When the Commission adopted the first set of comprehensive secondary markets rules in 2003 to allow WRS licensees to enter into a variety of leasing arrangements, it recognized the public interest benefits of permitting "additional spectrum users to gain ready access to spectrum," thus enabling the "provision of new and diverse services and applications to help meet the ever-changing needs of the public."<sup>170</sup> Under these long-standing rules, a licensee in any of the "included services" set forth in section 1.9005 of the Commission's rules may lease its exclusive spectrum usage rights for any purpose

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<sup>170</sup> *Secondary Markets R&O*, 18 FCC Rcd at 20619, para. 32.

permitted and authorized under the license.<sup>171</sup> We propose to leverage this existing leasing framework to facilitate the provision of SCS through our proposed entry criteria. This proposed approach enables the rapid provision of SCS on a terrestrial licensee's exclusively licensed spectrum operating in a relevant GIA.

69. We recognize, however, that our proposed framework does not squarely fit within the existing leasing regime. Thus, we also seek comment on the extent to which our leasing rules require amendment to effectuate SCS. For example, under section 1.9003, a spectrum lessee is defined as “[a]ny third-party entity that leases ... certain spectrum usage rights held by a licensee.”<sup>172</sup> Although a terrestrial licensee has the exclusive right to use its spectrum in its authorized geographic area, it is not authorized under part 25 of the Commission's rules to operate a space station to close coverage gaps in its network, notwithstanding the proposed MSS footnote allocation. Should we amend our leasing rules to specifically include in the definition of spectrum lessee a satellite operator that collaborates with a terrestrial licensee/lessor to provide SCS under our proposed framework? Should we also amend the definition of “spectrum leasing agreement,”<sup>173</sup> discussed below, to include leases involving the provision of SCS? Further, our current leasing rules require only a brief description of the lease as part of a Commission filing. Would it be in the public interest to require disclosure of any particular lease terms to the Commission in the application process, subject to any appropriate protections for proprietary information? Should we revise other current rules or add new rules in part 1, subpart X to effectuate the provision of SCS? What are the costs and benefits of taking such an approach?

70. *Spectrum Leasing Arrangements.* Although we propose to require licensees providing SCS to use the Commission's existing leasing regime, we seek comment on whether all aspects of the regime are appropriate in this novel context, or whether certain refinements are necessary. Spectrum leasing arrangements can take two forms:<sup>174</sup> spectrum manager leasing arrangements,<sup>175</sup> or *de facto* transfer leasing arrangements, which can be either long-term (more than one year) or short-term (one year or less).<sup>176</sup> Spectrum manager leasing arrangements generally do not require prior Commission approval; rather, the licensee/lessor must notify the Commission in advance of commencing operations.<sup>177</sup> In

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<sup>171</sup> See 47 CFR § 1.9001 *et seq.* Licensees holding exclusive use rights are permitted to engage in spectrum leasing whether their operations are characterized as commercial, common carrier, private, or non-common carrier. *Id.* § 1.9001(b).

<sup>172</sup> *Id.* § 1.9003.

<sup>173</sup> Section 1.9003 defines a “spectrum leasing arrangement” as “[a]n arrangement between a licensed entity and a third-party entity in which the licensee leases certain of its spectrum usage rights in the licensed spectrum to the third-party entity, the spectrum lessee.” 47 CFR § 1.9003.

<sup>174</sup> *Id.* The arrangement may involve the leasing of any amount of licensed spectrum, in any geographic area or site encompassed by the license, for any period of time during the term of the license authorization. *Id.*

<sup>175</sup> *Id.* §§ 1.9010, 1.9020. A licensee/lessor is deemed to have *de facto* control over the leased spectrum if it satisfies two conditions: (i) the licensee/lessor retains responsibility for lessee compliance with Commission policy and rules; and (ii) the licensee/lessor retains responsibility for interactions with the Commission, including all filings required under the license authorization and applicable service rules directly related to the leased spectrum. *Id.* § 1.9010(b).

<sup>176</sup> *Id.* §§ 1.9003, 1.9030(b).

<sup>177</sup> *Id.* § 1.9020(e) (requiring 21 days advance notice for spectrum manager leasing arrangements greater than one year in length, or 10 days advance notice for arrangements of one year or less in length). The Commission reviews the notifications to ensure that all necessary technical and other information is correctly submitted, but the subject spectrum leasing arrangement may be implemented without waiting for such review, unless the parties to the spectrum manager leasing arrangement have requested on the form that the arrangement become effective upon Commission acceptance of the notification. Spectrum manager leasing notifications require no prior public notice before the Commission may accept them. As noted in paragraph 7, *supra*, T-Mobile filed a spectrum manager lease notification for SpaceX satellites' use of T-Mobile's PCS spectrum. The T-Mobile/SpaceX lease applications

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contrast, *de facto* transfer spectrum leasing arrangements are typically subject to the Commission's general approval procedures, under which the Commission must grant the application prior to the parties putting the proposed spectrum leasing arrangement into effect.<sup>178</sup> Should all forms of leasing, including spectrum manager and *de facto* transfer (short- and long-term), be available in the SCS framework we propose today, or does the construct we propose, involving combined terrestrial and space components, warrant more limited leasing options? As SCS is intended solely to supplement coverage to a terrestrial licensee's subscribers, should we only permit spectrum manager leasing and prohibit *de facto* transfer lease arrangements, thus ensuring that a terrestrial licensee retains both *de jure* and *de facto* control of its spectrum? Does the introduction of a part 25 authorization on the same leased spectrum require us to re-examine our approach to control of spectrum, as it relates to leasing in the SCS context? Also, given the novel nature of SCS, should we require spectrum manager leases for such operations to obtain prior Commission approval, notwithstanding the procedures typically applicable to such leases? If commenters seek to limit leasing options, which options should be limited, and would such limitations deter investment in SCS?

71. Our proposal to authorize SCS through a leasing component would involve permitting a terrestrial licensee to lease to an expanded group of potential lessees that includes satellite operators. A terrestrial licensee currently has the right to serve the identical geographic area on the same spectrum under its existing licenses, and SCS would simply involve a new method (through a combination of part 25 licensing and part 1 lease arrangement) of providing gap coverage. We therefore tentatively conclude that our proposal would not be a modification of any terrestrial licenses under section 316 of the Communications Act.<sup>179</sup> We seek comment on this analysis.

72. *Construction Attribution.* Under certain leasing arrangements, our current rules allow a lessor to attribute the construction activities of its lessee to the lessor's performance requirements. Thus, under a spectrum manager leasing arrangement, the licensee/lessor remains responsible for compliance with any construction and performance requirements applicable to the leased spectrum, but may attribute to itself the build-out or performance activities of its spectrum lessee(s) for purposes of compliance with any such requirements.<sup>180</sup> Similarly, under a long-term *de facto* transfer spectrum leasing arrangement, the licensee/lessor may attribute to itself the buildout or performance activities of its spectrum lessee(s) for purposes of compliance with any such requirements.<sup>181</sup> We seek comment on whether such attribution rules should remain available to terrestrial licensees where SCS is intended to supplement existing terrestrial service to fill coverage gaps.

73. We recognize that our performance rules in most flexible-use terrestrial bands were created in parallel with the advent and subsequent implementation of competitive bidding for licenses. Accordingly, market forces and incentives resulted in virtually all of the performance metrics in flexible-use bands (e.g., coverage of a certain percentage of population) being met with the provision of evolving

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remain pending, and the spectrum leasing arrangement has not been implemented. See ULS File Nos. 0010303032 (lead), 0010303146, 0010303124, and 0010303084.

<sup>178</sup> 47 CFR §§ 1.9030(a), 1.9035(a). Both long-term and short-term *de facto* transfer spectrum leasing applications are subject to overnight processing under the Commission's immediate approval procedures if the filing meets certain conditions. *Id.* §§ 1.9030(e)(2) (immediate approval procedures), 1.9035(e) (certain conditions still must be met in order for a short-term *de facto* transfer lease to qualify for immediate processing).

<sup>179</sup> See 47 U.S.C. § 316.

<sup>180</sup> 47 CFR § 1.9020(d)(5).

<sup>181</sup> However, such attribution is not available to a licensee/lessor under a short-term *de facto* transfer spectrum leasing arrangement. See 47 CFR §§ 1.9030(d)(5), 1.9035(d)(3). See also *Secondary Markets R&O*, 18 FCC Rcd at 20676, para. 177 (“[S]hort-term leasing arrangements are expressly designed to be temporary in nature, and therefore cannot be counted to establish that the licensee is meeting the purposes and policies underlying our buildout rules, including the goal of ensuring establishment of service in rural areas.”).

4G and 5G technologies serving commercial handsets. As stated, SCS is intended to fill coverage gaps in rural and other unserved areas to supplement existing terrestrial service. As we do not intend for this new paradigm to alter market incentives in the provision of core coverage to licensed areas, should we revise our leasing rules in the alternative to permit terrestrial licensees to enter lease arrangements with satellite partners to extend existing coverage only after the terrestrial licensee has first met all of its final performance obligations for each underlying license that is part of the GIA? Also, given that our proposed framework would permit satellite operators to access spectrum previously allocated for terrestrial use to effectuate the provision of SCS, and recognizing that SCS service options initially may be more limited than a terrestrial licensee's core service offerings, should we permit a terrestrial licensee to rely on its satellite lessee partner's coverage to meet underlying terrestrial performance obligations? Would this potentially result in circumvention of our existing performance rules? If we permit such attribution, should we also pair that flexibility with increased performance requirement metrics applicable to the terrestrial licensee? If so, what are the appropriate benchmarks to ensure that service is provided in the public interest?

74. *License Term of Part 25 License and Length of Lease.* Under our rules, the term of a spectrum leasing arrangement may not be longer than the term of the underlying lessor's license.<sup>182</sup> However, a licensee and spectrum lessee that have entered into an arrangement with a term continuing to the end of the current license authorization may, contingent on the Commission's grant of the license renewal, extend the spectrum leasing arrangement into the term of the renewed license authorization.<sup>183</sup> Below, we propose to apply the current part 25 rule regarding license terms to satellite licensees seeking to provide SCS through license modification; such licensees would retain their current license term of 15 years.<sup>184</sup> This license term, however, is unlikely to consistently align with the license term (and concomitant lease term) of the underlying terrestrial license. Given the integral nature of the lease-based collaboration between satellite operator and terrestrial licensee in our proposed SCS framework, how should we account for differences in the length of a part 25 space station authorization to transmit and receive signals and the length of the associated lease, which is tied to the remaining term of the underlying terrestrial license? What provisions should we make in the framework in the event that the terrestrial licensee loses some or all of the licenses that comprise the leased area, for example, as a result of automatic termination for failure to meet performance obligations, failure to receive a license renewal, license revocation, or assignment or transfer?

75. *Interference-Related Leasing Rules.* Our current leasing rules require all lessees to comply with rules requiring responsibility for ensuring non-interference with co-channel and adjacent channel licensees applicable to the lessor/licensee under the license authorization.<sup>185</sup> However, primary responsibility for such compliance depends on the type of lease. With a spectrum manager lease, the lessor/licensee has "direct responsibility and accountability for ensuring that their spectrum lessees comply with [the interference-related service] rules, including responsibility for resolving all interference

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<sup>182</sup> All spectrum leasing arrangements must provide that "[i]f the license is revoked, cancelled, terminated, or otherwise ceases to be in effect, the spectrum lessee has no continuing authority or right to use the leased spectrum unless otherwise authorized by the Commission." 47 CFR § 1.9040(a)(2).

<sup>183</sup> *Id.* §§ 1.9020(m) (spectrum manager leases), 1.9030(l) (long-term *de facto* transfer leases), 1.9035(n) (short-term *de facto* transfer leases). The Commission must be notified of the renewal of the spectrum leasing arrangement at the same time that the licensee submits its application for license renewal (see § 1.949). In addition, the spectrum lessee may operate under the extended term, without further action by the Commission, until such time as the Commission shall make a final determination with respect to the renewal of the license authorization and the extension of the spectrum leasing arrangement into the term of the renewed license authorization.

<sup>184</sup> See *infra* para. 98.

<sup>185</sup> *Secondary Markets R&O*, 18 FCC Rcd at 20665, para. 142; see also 47 CFR §§ 1.9010(b)(1)(ii), 1.9020(d)(1), 1.9030(d)(1), 1.9035(d).

disputes.<sup>186</sup> In contrast, under a *de facto* transfer lease, the spectrum lessee has primary responsibility for ensuring compliance with the Commission's policies and rules, including interference rules applicable to the lessor/licensee.<sup>187</sup> Thus, in the event of an interference issue under a *de facto* transfer lease, the "Enforcement Bureau will first approach the authorized spectrum lessee, and the lessee will be expected to bring its operations into compliance with the Commission's requirements."<sup>188</sup> We seek comment on whether to retain this existing hierarchy of responsibility in the context of our proposed SCS framework.<sup>189</sup> Does the introduction of authority, through a combination of part 25 licensing and part 1 leasing, to communicate with space stations on previously allocated terrestrial-only spectrum warrant revisions to our rules as they relate to interference resolution? In the case of a spectrum manager lease under our proposed SCS framework, is it practical and appropriate for direct responsibility and accountability to apply to the lessor/licensee, or should the lessee, given that it has been issued a separate part 25 authorization, be responsible for interference resolution?

76. *Lease Severability.* As emphasized in this Notice, a lease agreement between a satellite operator and a terrestrial licensee is an integral part of our proposed framework to foster SCS. We seek to provide flexibility in leasing arrangements and acknowledge business realities, while ensuring against potential abuse of Commission processes. Accordingly, we seek comment on how our proposed SCS framework should address the potential for severability of a lease agreement. For example, what limitations, if any, are necessary regarding the parties' ability to terminate the lease that forms a substantial basis of the SCS licensing structure? Should we implement minimum lease terms to ensure continued gap coverage and, if so, what is the appropriate period? Should a part 25 space station authorization for SCS automatically terminate if the underlying lease is terminated? Or should we include a condition indicating that operations in the relevant frequencies must stop if the underlying lease is terminated? Likewise, what should be the effect of such lease termination on a part 25 blanket earth station license? If the parties decide not to renew a lease, should the associated part 25 space station and blanket earth station authorizations terminate? Alternatively, if the satellite operator's part 25 authorization is not renewed, or terminates for failure to meet applicable milestones, or is revoked, or if the terrestrial operator's earth station license is not renewed, should the associated lease terminate? Should that termination be automatic? What provisions should we consider to ensure gap service is achieved for a limited period in the event the underlying lease is terminated? How should we account for these and other scenarios related to lease severability? We seek comment on these issues, including the costs and benefits of proposed solutions.

77. *Subleasing.* Our leasing regime allows a spectrum lessee in a spectrum manager or long-term *de facto* transfer leasing arrangement to sublease its leased spectrum usage rights with the licensee's consent and through the licensee's establishment of privity with the spectrum sublessee.<sup>190</sup> In our proposed framework, a satellite operator that is also the lessee would be providing SCS gap coverage to the subscribers of the terrestrial licensee that is the earth station licensee and the lessor, and the ability to sublease to a third party may raise practical or technical issues regarding the continued provision of sufficient service quality to subscribers. Accordingly, we seek comment on whether subleasing is appropriate in the proposed framework, which relies on the direct collaboration between the lessee and the lessor. Could subleasing introduce unintended consequences, including adversely affecting supplemental coverage or increasing the potential for harmful interference?

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<sup>186</sup> *Secondary Markets R&O*, 18 FCC Rcd at 20653, para. 108.

<sup>187</sup> *Id.* at 20664, 20675, paras. 137, 172-73.

<sup>188</sup> *Id.* at 20664, para. 138.

<sup>189</sup> *See supra* para. 53.

<sup>190</sup> 47 CFR §§ 1.9020(l), 1.9030(k). The licensee must submit a notification regarding the spectrum subleasing arrangement in accordance with the applicable notification procedures set forth in this section. *Id.* §§ 1.9020(l), 1.9030(k). Subleasing is not permitted under a short-term *de facto* transfer lease. *Id.* § 1.9035(m).



78. *Eligibility for ECIP Participation.* In July 2022, the Commission established the Enhanced Competition Incentive Program (ECIP), which among other things, modified the Commission's leasing rules to provide incentives for stakeholders to engage in qualifying transactions that make spectrum available in rural areas for advanced wireless services.<sup>191</sup> In adopting ECIP,<sup>192</sup> the Commission sought to facilitate new opportunities for small carriers and Tribal Nations to increase access to spectrum, while incorporating provisions to ensure against program waste, fraud and abuse.<sup>193</sup> Given that our proposed framework is primarily intended to facilitate SCS to existing consumer handsets, and ECIP was adopted with requirements tailored specifically towards provision of service through terrestrial base stations, we seek comment on whether to make SCS participants, necessarily engaged in leasing arrangements, eligible for ECIP benefits.

79. Specifically, under ECIP, parties can become eligible to receive program benefits, including lengthened license terms and extended timeframes to meet performance requirements, under either of two prongs, one focusing on transactions with small carriers or Tribal Nations and a second focusing on transactions resulting in construction in rural areas.<sup>194</sup> In the rural transactions-focused prong of the program, various requirements apply to receive program benefits and to prevent waste, fraud and abuse. For example, leasing arrangements must be for a minimum of five years, a lessee is required to construct an area of between 300 and 15,000 square miles (Qualifying Geography), depending upon the size of the lessor's licensed area, within two years of the ECIP grant, and a lessee must maintain continuous operations in that entire Qualifying Geography area for three consecutive years.<sup>195</sup> As our proposed SCS framework requires a single terrestrial licensee to hold all relevant co-channel licenses covering an entire GIA (e.g., CONUS), how would prospective ECIP applicants meet the eligibility requirements and requisite Qualifying Geography thresholds through provision of a satellite service primarily intended to fill-in terrestrial coverage gaps in select areas that currently experience limited to no coverage? We seek comment on a range of possible concerns in applying to SCS stakeholders a program that was created to incentivize transactions to facilitate terrestrial build-out through a terrestrial-based regulatory licensing paradigm. Among these concerns, we seek comment on how we would apply ECIP rules requiring specific lessee action under the rural transactions-focused prong to a part 25 satellite-licensed lessee, with particular focus on the requirement that a lessee provide service for the entire Qualifying Geography for three continuous years and that service must commence no later than two years after entering the lease. How would we address any potential conflict between these ECIP obligations, terrestrial licensee performance requirements, and part 25 milestones applicable to the satellite licensee? Can parties meet ECIP requirements in an SCS context, or would the tailored conditions of ECIP participation reduce the flexibility of potential terrestrial-satellite collaborators and thus operate as a disincentive to participate in the program even if permitted?

80. *911-Related Leasing Rules.* Finally, we seek comment on whether we should modify existing leasing rules related to the provision of 911 service. For example, a lessee's obligation to comply with Enhanced 911 (E911) requirements under section 9.10 of our rules depends on the type of lease entered into by the parties.<sup>196</sup> Given that we are separately considering below whether to impose

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<sup>191</sup> *Partitioning, Disaggregation, & Leasing of Spectrum*, WT Docket No. 19-38, Report and Order and Second Further Notice of Proposed Rulemaking, FCC 22-53, paras. 1-2 (July 18, 2022) (*ECIP R&O*).

<sup>192</sup> We note that, to date, the rules substantially implementing the ECIP program have not become effective, as the Commission has not received the required OMB approval under the Paperwork Reduction Act.

<sup>193</sup> *ECIP R&O*, paras. 1-2.

<sup>194</sup> *Id.* at paras. 64-66.

<sup>195</sup> *ECIP R&O*, Appx. A; 47 CFR § 1.60004.

<sup>196</sup> See 47 CFR §§ 1.9020(d)(8) (under spectrum manager leases “[i]f E911 obligations apply to the licensee (see § 9.10 of this chapter), the licensee retains the obligations with respect to leased spectrum.”), 1.9030(d)(8) (under long-term de facto transfer leases, “to the extent the licensee is required to meet E911 obligations (see § 9.10 of this (continued....))

independent 911 obligations on satellite operators seeking to provide SCS as part of their part 25 authorization, how should we address any potential inconsistencies between the E911 requirements under the satellite operator's lease and any independent 911 obligation under the satellite operators license?<sup>197</sup>

#### 4. Service Rules

81. When adopting service rules for licensing spectrum, the Commission seeks to encourage investment, promote efficient spectrum use, and spur robust deployment, while tailoring its approach to the unique characteristics of each band.<sup>198</sup> Here, we propose a framework to facilitate the closing of terrestrial network coverage gaps through satellite transmissions on currently licensed terrestrial, flexible-use spectrum. Accordingly, in this section, we address existing service rule obligations for satellite operators and terrestrial wireless providers, by proposing to apply certain relevant rules, or seeking comment on the applicability of other rules in the context of the proposed part 25 licensing framework to authorize SCS. In addressing these issues, commenters should discuss the costs and benefits associated with application of these obligations and any alternatives that commenters propose.

82. *Regulatory Status.* Pursuant to the Commission's part 25 rules, a space station licensee must select its regulatory status—common-carrier or non-common carrier—when it files an application for a space station authorization.<sup>199</sup> Currently, Commission licensing records reflect that satellite space station licenses typically have a non-common carrier status, even if operated with earth stations that have a common carrier status. In contrast, in the vast majority of cases, terrestrial wireless licensees in flexible-use bands are regulated as Commercial Mobile Radio Service (CMRS) providers.<sup>200</sup> We propose that the space station licensee would retain its existing regulatory status when applying to modify its license to provide SCS. We seek comment on what circumstances might warrant a change in the space station licensee's regulatory status. For example, how should we address circumstances in which a satellite operator has a different regulatory status than its terrestrial licensee partner? Further, in the event we expand the proposed framework to include new satellite entrants, should we adopt a similar approach for any new part 25 applicants seeking to provide commercial services from a space station to the subscribers of a terrestrial service provider? In addition, as part of the revised part 25 blanket earth station licensing process discussed above, we seek comment on the issue of a terrestrial licensee seeking blanket earth station licensing for its subscriber devices selecting its regulatory status when filing an earth station application. Are there circumstances in which the regulatory status specified for the blanket earth station license could be different than the status for the terrestrial mobile service provider offering SCS,

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chapter), the spectrum lessee is required to meet those obligations with respect to the spectrum leased under the spectrum leasing arrangement insofar as the spectrum lessee's operations are encompassed within the E911 obligations.”), 1.9035(d)(4) (under short-term de facto transfer leases: “[i]f E911 obligations apply to the licensee (see § 9.10 of this chapter), the licensee retains the obligations with respect to leased spectrum. A spectrum lessee entering into a short-term de facto transfer leasing arrangement is not separately required to comply with any such obligations in relation to the leased spectrum.”).

<sup>197</sup> See *infra* paras. 83-91.

<sup>198</sup> For example, when adopting licensing approaches for mid-band spectrum, for the 3.45 GHz band and the 3.7-4.2 GHz band, the Commission adopted similar rules for licensing pursuant to its flexible-use part 27 rules, which permit licensees to provide any fixed or mobile service consistent with the permitted allocations, subject to rules necessary to prevent or minimize harmful interference, with minor differences due to the needs of each band. See *Facilitating Shared Use in the 3100-3550 MHz Band*, WT Docket No. 19-348, Second Report and Order, Order on Reconsideration, and Order of Proposed Modification, 36 FCC Rcd 5987 (2021) (*3.45 GHz Band Second R&O*); *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343 (2020) (*3.7 GHz Service Order*).

<sup>199</sup> See 47 CFR § 25.114(c)(11).

<sup>200</sup> See 47 U.S.C. § 332; 47 CFR pt. 20. CMRS licensees are regulated as common carriers. 47 CFR pt. 20.

and if so, how should we address any regulatory anomaly?<sup>201</sup> We note that a licensee's regulatory status may affect the applicability of certain Commission rules, e.g., payment of regulatory fees (including amount and timing of payment) and compliance with applicable Title II and Title III statutory obligations. We seek comment on our proposal and any alternatives, including the costs and benefits.

83. *911 Requirements.* 911 service is a vital part of our nation's emergency response and disaster preparedness system, and the Commission is committed to increasing public safety by encouraging and coordinating development of a nationwide, seamless communications system for emergency services that is regularly upgraded. We seek comment on whether to extend our wireless 911 requirements to the proposed provision of SCS that would enable satellite transmissions to terrestrial devices.<sup>202</sup> Section 9.10 of the Commission's rules describes 911 requirements applicable to CMRS providers, including requirements to support basic 911 and Enhanced 911 (E911), outdoor and indoor location accuracy, and text-to-911.<sup>203</sup> MSS providers, however, are exempt from these requirements,<sup>204</sup> but are required to support emergency call center service to the extent that they offer two-way interconnected voice service.<sup>205</sup>

84. Given that a key benefit of SCS is to provide connectivity to Americans in areas where they may have no other option for communications service, we seek comment on how best to facilitate access to our nation's emergency response system for consumers using SCS. In addition, because consumers using commercial wireless handsets typically have an expectation that they can connect to 911 operators, we seek comment on how best to inform consumers using SCS of the extent of their connectivity to 911. We seek comment on the technical and operational challenges, costs, and public interest benefits of extending wireless 911 requirements to CMRS providers and satellite providers that offer SCS. We also seek comment on whether it is technically or otherwise feasible for terrestrial service providers to satisfy the requirements in section 9.10 when incorporating their satellite operator collaborator's supplemental service, and if not, which particular requirements are not feasible and why.

85. As we propose to issue part 25 modified authorizations to satellite operators on previously terrestrial-only spectrum to facilitate improved terrestrial service coverage, we also seek comment on whether we should revise our rules to require specific satellite operator compliance with certain 911 requirements. In other words, should all or some of the CMRS 911 and E911 rules apply to both SCS partners, individually or together? Similarly, should our text-to-911 rules for covered text providers apply to terrestrial and satellite SCS collaborators that support interconnected text via satellite, individually or together?

86. Further, we propose to modify our part 25 rules to require a terrestrial licensee that seeks to collaborate with a satellite operator to provide SCS, to apply for a blanket earth station license for all of its subscribers' terrestrial devices that are otherwise authorized under its terrestrial license, to operate using transmissions to and from the satellite operator's space stations. As noted, under existing rules, an MSS blanket earth station licensee would be excluded from complying with section 9.10 of the

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<sup>201</sup> The existing part 25 earth station licensing process requires the applicant to indicate a regulatory status when filing FCC Form 312. *See* 47 CFR § 25.115(a)(1)(i).

<sup>202</sup> For example, as noted above, T-Mobile and SpaceX announced a partnership that envisions complete coverage of the United States, beginning with text service (i.e., SMS and MMS), followed by voice and data service. *See supra* note 14 (T-Mobile announcing plans to leverage Starlink, SpaceX's constellation of satellites in low Earth orbit, and T-Mobile's wireless network to give customers an additional layer of connectivity and provide "near complete coverage in most places in the U.S. – even in many of the most remote locations previously unreachable by traditional cell signals.").

<sup>203</sup> *See* 47 CFR § 9.10.

<sup>204</sup> *See id.* § 9.10(a).

<sup>205</sup> *Id.* § 9.18.

Commission's rules.<sup>206</sup> Should we amend this section given that the earth station license will likely be used to supplement an existing CMRS service to which 911, E911, and text-to-911 requirements apply? We seek specific comment on any revisions necessary to existing section 9.10 rules for CMRS providers as applied to SCS that would promote the public interest.

87. We also seek detailed information on the process by which SCS is activated when a consumer attempts to access 911 services during emergencies, including when no cellular or Wi-Fi service is available. Commenters should address the criteria and the processes for triggering SCS to support 911 calls and text when commercial mobile networks and Wi-Fi are unavailable, including incident specific timing (i.e., once a commercial mobile network is determined to be unavailable, how much time is needed to connect to 911?). For purposes of initiating a 911 call or text, how would the device with access to SCS determine the Radio Access Network on which to transmit the call? Is satellite service for a call or text to 911 lower in priority than other CMRS networks or Wi-Fi networks? How would the order of priority impact the availability of various 911 services such as voice calls to 911 or texts to 911 or the quality of 911 location data?

88. We ask commenters to discuss how satellite providers would route 911 services, including voice and text-to-911. For 911 calls made over SCS, is it feasible to route 911 calls to the appropriate Public Safety Answering Point (PSAP) with the caller's location information? What are the costs associated with enabling SCS to deliver location information to PSAPs? Commenters should address 911 callback capabilities for 911 access and the technical, cost, and implementation timelines. In addition, we seek comment on consumer expectations for using SCS to reach 911, and any consumer privacy concerns with SCS. We seek comment on standards development and best practices needed to facilitate 911 services using SCS, including who should develop them and required timelines.

89. We also seek comment on the feasibility, availability, and cost of provisioning consumer devices to support SCS for 911. Could handset models be enabled to automatically seek and try to connect to any available partnering satellite networks when 911 is dialed without users having to select a satellite network? Would such handset capability require new hardware or software, and what are the likely costs and development cycles for such technology? What are the capabilities of device-based hybrid technologies to enhance location accuracy of SCS in outdoor and indoor environments? How would an SCS offering support members of the public who have non-service initialized (NSI) phones (phones without a contractual relationship with a CMRS provider)? We seek comment on congestion issues that could be associated with SCS supporting 911 calls and texts.

90. The Commission's rules also require that providers of MSS to end-user customers comply with certain requirements regarding emergency call centers in certain circumstances and annual reporting requirements on call center traffic.<sup>207</sup> We seek comment on how we should apply these current obligations in the context of an SCS offering in which the part 25 license or grant of market access holder modifies its existing part 25 authorization and leases exclusive-use spectrum, most likely from a CMRS wireless provider. Should all the existing obligations continue to apply to the satellite operator? Should we amend our rules to reflect that MSS usage of the specific terrestrial bands where we propose a satellite allocation results in a requirement to comply with section 9.18? Given the manner in which SCS would be licensed and provided, are other rule revisions necessary? As stated above, we propose an approach under part 25 whereby a terrestrial licensee would seek a blanket earth station license for all its subscribers' terrestrial devices. To the extent a CMRS licensee fills in coverage gaps using a part 25 blanket earth station license, is it appropriate to apply current section 9.18 requirements? Should we consider applying additional 911 or E911 obligations to a new blanket earth station license issued in the terrestrial satellite partner context?

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<sup>206</sup> See *id.* § 9.10(a).

<sup>207</sup> See *id.* § 9.18.

91. We seek comment on the anticipated public safety impacts of supplemental voice and text satellite coverage in areas that have not previously received service or during emergencies when the CMRS network is otherwise unavailable. Have terrestrial satellite partners engaged in or planned any outreach or coordination with public safety entities ahead of implementation? Further, do providers plan to alert subscribers in any way of any limitations on calling or texting 911 from a handset connected to satellite services? We seek comment on whether we should modify any of the Commission's part 9 rules, including those that apply to CMRS, MSS, or covered text providers, to accommodate increased use of this service and ensure reliable connectivity to 911.

92. *Wireless Emergency Alerts (WEA)*. We seek comment on how satellite operators participating in anticipated collaborations with terrestrial licensees intend to support WEA and any accompanying public safety benefits.<sup>208</sup> Could satellite operators' support for WEA improve WEA's availability and reliability in areas underserved by terrestrial wireless providers? Conversely, we seek comment on whether satellite operators that supplement terrestrial wireless providers' coverage areas could adversely affect WEA's reliability and availability or change the nature of a provider's participation in WEA from in whole to in part if the SCS satellite operators were to not participate in WEA.<sup>209</sup> Should CMRS providers that elect to participate in WEA update their election status to reflect the extent to which their arrangement with satellite operators changes the nature of the WEA service that they provide? We also seek comment on whether the proposed SCS framework is compatible with the Federal Emergency Management Agency's Integrated Public Alert & Warning System (IPAWS).

93. We seek comment on satellite operators' technical capability to geographically target (geo-target) WEAs and limit overshoot. For technically capable networks, the Commission requires participating CMRS providers to "match" the target area specified by an alert originator (i.e., deliver a WEA alert to 100% of the geographic area specified by an alert originator with no more than 0.1 mile overshoot).<sup>210</sup> Are satellite operators' systems technically capable of matching the target area by delivering target area coordinates to mobile devices because, for instance, they offer a satellite equivalent of 4G and 5G? Are the mobile devices capable of receiving wireless services from satellite operators generally newer devices capable of geofencing? If a participating CMRS provider's network infrastructure is technically incapable of matching the specified target area, the Commission's rules require that the provider deliver the alert message to an area that "best approximates" the specified target area.<sup>211</sup> According to CTIA, as of July 2022, approximately 40% of active smartphones are technically incapable of geofencing the receipt of WEA alerts, a technology necessary to meet the matching standard.<sup>212</sup> Those handsets are eligible to receive WEA alerts whenever they are connected to a wireless network facility that a participating CMRS provider uses to transmit a WEA, even if they are located far outside of the geo-targeted area. If satellite operators participate in WEA, in how large of a geographic

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<sup>208</sup> The Warning, Alert and Response Network (WARN) Act directed the Commission to adopt technical requirements to enable this alerting capability for CMRS providers. Warning, Alert and Response Network (WARN) Act, Pub. L. No. 109-347, Title VI, § 602(a), 120 Stat. 1936 (2006) (WARN Act) (codified at 47 U.S.C. § 1201(a)). Currently, no satellite operators participate in WEA, however, in meetings with the Commission's Public Safety and Homeland Security Bureau staff, representatives from the T-Mobile-SpaceX and Apple-Globalstar partnerships stated that they intend to support WEA.

<sup>209</sup> See 47 CFR §§ 10.240-10.250.

<sup>210</sup> See *Wireless Emergency Alerts; Amendments to Part 11 of the Commission's Rules Regarding the Emergency Alert System*, PS Docket Nos. 15-91 and 15-94, Second Report and Order and Second Order on Reconsideration, 33 FCC Red 1320, 1324-25, para. 6 (2018); 47 CFR § 10.450.

<sup>211</sup> See 47 CFR § 10.450.

<sup>212</sup> See Letter from Amy Bender, Vice President, Regulatory Affairs, CTIA to Debra Jordan, Chief, Public Safety and Homeland Security Bureau, FCC, PS Docket No. 15-91, at 2 (July 28, 2022). WEA geofencing enables capable mobile devices to suppress the presentation of received WEA alerts when they are located outside of the targeted area.

area would mobile devices connected to the satellite receive WEA messages by virtue of the technical parameters of satellite beamforming? Would this exacerbate the issue of WEA overshoot? What steps, if any, could satellite operators take to contain the potential for overshooting the targeted area? Timely delivery of WEA alert messages also is an important factor in warning the public. How would the technical parameters of satellite beamforming affect the amount of time that it takes for WEAs to reach the public from the time they are transmitted by alert originators?

94. *Competition Policies.* As the Commission has often stated, spectrum is a necessary input for the provision of mobile wireless services, and the Commission has developed policies to ensure that spectrum is assigned in a manner that promotes competition, innovation, and efficient use.<sup>213</sup> In this proceeding, we seek comment on spectrum aggregation and other potential competitive issues in the context of a collaboration that, as proposed, allows a satellite operator to gain access to previously allocated terrestrial-only spectrum, and includes a lessor-lessee relationship between a satellite operator and its terrestrial collaborator.

95. In evaluating the potential competitive effects of spectrum aggregation in secondary market transactions, including long-term spectrum leasing arrangements, the Commission uses a spectrum screen to help it identify, on a case-by-case basis, those local markets that may warrant further competitive analysis.<sup>214</sup> The spectrum screen trigger is approximately one-third of the total spectrum that the Commission has determined is suitable and available for mobile voice/mobile broadband use.<sup>215</sup> Further, below-1-GHz spectrum concentration is an enhanced factor in the Commission's review if, post-transaction, the acquiring entity would hold more than one-third of the currently available and suitable

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<sup>213</sup> The Communications Act requires the Commission to examine closely the impact of spectrum aggregation on competition, innovation, and the efficient use of spectrum to ensure that spectrum is assigned in a manner that serves the public interest, convenience, and necessity. See 47 U.S.C. §§ 303(g), 307, 308(b), 310. Section 309(j)(3) of the Act provides that, in designing systems of competitive bidding, the Commission must “include safeguards to protect the public interest in the use of the spectrum,” and must seek to promote various objectives, including “promoting economic opportunity and competition and ensuring that new and innovative technologies are readily accessible to the American people by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants,” and promoting the “efficient and intensive use” of spectrum. *Id.* § 309(j)(3). In addition, Congress did not intend, in limiting the Commission's ability to deny licenses to auction winners who meet the required licensed qualifications, to “affect any authority the Commission has to adopt and enforce rules of general applicability, including rules concerning spectrum aggregation that promote competition.” *Id.* § 309(j)(17)(B).

<sup>214</sup> *Policies Regarding Mobile Spectrum Holdings Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, WT Docket No. 12-269, GN Docket No. 12-268, Report and Order, 29 FCC Rcd 6133, 6221-22, paras. 225, 245 n.656 (2014) (*Mobile Spectrum Holdings Report and Order*); see also 2022 *Communications Marketplace Report*, GN Docket No. 22-203, Report, FCC 22-103 at para. 83 (2022) (2022 *Communications Marketplace Report*), <https://www.fcc.gov/reports-research/reports/consolidated-communications-marketplace-reports/CMR-2022> (last visited Jan. 3, 2023). The Commission has explained that the main purpose of the spectrum screen is to act as an analytical tool in identifying markets where: (1) there could be an increased likelihood that rival service providers or potential new entrants would be foreclosed from expanding capacity, deploying mobile broadband technologies, or entering the market; and (2) rivals' costs could be increased to the extent that they would be less likely to compete robustly. See, e.g., *3.45 GHz R&O and FNPRM* at para. 109.

<sup>215</sup> 2022 *Communications Marketplace Report* at para. 84 n.215, Fig. II.B.9. The Commission has listed the following bands as included in the spectrum screen: 600 MHz, 700 MHz, Cellular, SMR, Broadband PCS, AWS-1, AWS-3, AWS-4, H Block, WCS, BRS, EBS, 3.7 GHz, and 3.45 GHz.

spectrum below 1 GHz.<sup>216</sup> Commission rules and policies specify how spectrum holdings are attributed to particular entities, including the attribution of spectrum holdings to both the lessor and lessee.<sup>217</sup>

96. We seek comment on applying our existing secondary market policies on spectrum attribution and aggregation to the proposed satellite-terrestrial leasing framework. In other words, to the extent that a satellite operator leases spectrum that is attributed to the lessor for purposes of our existing secondary market aggregation policies, should that spectrum be attributed to the satellite operator for the same purposes?<sup>218</sup> Are there any changes that we should make to our existing secondary market spectrum policies in the context of the proposed satellite-terrestrial leasing framework? To the extent that we adopt a different framework to facilitate SCS, such as a part 25 co-channel authorization for satellite operators without leasing from terrestrial licensees (e.g., through operating agreements or other types of arrangements), should we apply or change our existing secondary market policies on spectrum attribution and aggregation and, if so, how?

97. Further, are there any additional competitive or public interest concerns that we should consider that would weigh in favor of placing limits on the collaboration? For example, stakeholders have indicated that the initial provision of SCS is likely to focus on messaging-type services in areas that terrestrial networks have difficulty covering, but could evolve to include increased capacity with enhanced capabilities and functionality. To what extent would authorizing SCS as proposed impact current commercial agreements (e.g., secondary markets and/or roaming arrangements), particularly those involving smaller carriers, or impact stakeholders' prospective participation in the Commission's recently adopted ECIP program? We seek comment on whether and to what extent the proposed SCS framework, if adopted, could impact marketplace incentives to negotiate such future commercial agreements.<sup>219</sup> We also seek comment on whether we should apply the current policies that ensure competition to satellite operators that enter into these kinds of arrangements and, if so, how? Is there a need to limit the number and scope of arrangements that a particular terrestrial service provider or satellite operator can enter, or is the provision of SCS too nascent to adopt such limits at this time? Conversely, should our eligibility criteria for such a partnership consider any limitations on the ability of either party to restrict the other's entry into such arrangements with third parties with respect to other frequency bands? Should the assessment be a case-by-case public interest analysis? Commenters should discuss and quantify any costs and benefits associated with applying restrictions to the flexible-use spectrum proposed for use in providing SCS.

98. *License Term and Renewal.* Under section 25.121(a) of the Commission's rules, with some exceptions, licenses for facilities governed by part 25 are issued for a period of 15 years.<sup>220</sup> Consistent with our proposed framework, a part 25 space station license that is modified to add SCS would retain whatever license term remains under its existing license, and a new part 25 blanket earth station license granted to provide SCS would be granted for a term of 15 years. A modification of an existing part 25 grant of market access to add SCS would not alter the effectiveness of that grant, but to continue operations to provide SCS in the United States, there would need to be a valid blanket U.S. earth station license for purposes of communicating with the non-U.S.-licensed space station with SCS market

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<sup>216</sup> *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6240, paras. 282-88. With respect to 600 MHz licenses acquired in the Broadcast Incentive Auction, the Commission adopted rules prohibiting secondary market transactions within a specified time period. *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6212, paras. 197-98; 47 CFR § 20.22(c).

<sup>217</sup> *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6228, para. 246 n.656, paras. 301-02; 47 CFR § 20.22(b)(5).

<sup>218</sup> See, e.g., *Mobile Spectrum Holdings Report and Order*, 29 FCC Rcd at 6228, para. 246 n.656.

<sup>219</sup> See CCA Ex Parte Letter at 1.

<sup>220</sup> 47 CFR § 25.121(a)(1).

access.<sup>221</sup> In other words, if the associated blanket earth station license is not renewed at the end of its term or is terminated for some reason, the SCS portion of the market access grant should also be automatically terminated. We seek comment on applying this approach in the SCS context, including its costs and benefits. Pursuant to section 25.121 of the Commission's rules, an application seeking renewal of an earth station license must be submitted no earlier than 90 days, and no later than 30 days, before the expiration date of the license, and an application for a space station system replacement authorization (comparable to what is considered a renewal in the context of terrestrial mobile licensing) for NGSO satellites must be filed no earlier than 90 days, and no later than 30 days, prior to the end of the twelfth year of the existing license term.<sup>222</sup> We propose to apply current part 25 rules for modified part 25 licenses and for new blanket earth station licenses, and we seek comment on this approach.

99. We note that for terrestrial wireless service providers, section 1.949 of the Commission's rules provides that a licensee seeking renewal must file a renewal application and satisfy a renewal standard.<sup>223</sup> Specifically, a licensee must demonstrate a level of service over the course of the license term by meeting a safe harbor or making a renewal showing independent of the relevant performance requirements, as a condition of renewal.<sup>224</sup> A failure to meet the renewal standard results in denial of the renewal application and return of the licensed spectrum to the Commission's inventory for reassignment.<sup>225</sup> We seek comment on whether we should amend our part 25 rules to require a similar renewal showing for a satellite operator seeking to renew a part 25 license that was modified under our proposed SCS framework. In addition, we seek comment on any relevant changes to the terrestrial licensee renewal rules. For example, should a terrestrial licensee that has not provided terrestrial coverage to a particular licensed area over the course of its license term be able to use SCS operations to meet the end of term renewal standard in section 1.949?<sup>226</sup>

100. *Deployment Milestones for Part 25 Licensees.* As a general matter, the Commission establishes performance requirements for licensees to ensure that spectrum is intensely and efficiently used.<sup>227</sup> The Commission has applied varying performance requirements to different spectrum bands based on their unique circumstances.<sup>228</sup> Given our proposal to authorize SCS in the public interest, we

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<sup>221</sup> Under Commission rules, terrestrial wireless service licenses and U.S. granted space station licenses are subject to license terms and renewal obligations. *See, e.g.*, 47 CFR §§ 1.949, 24.15, 25.121. Earth station licenses granted in accordance with the terms of a market access grant are subject to the same license terms and renewal obligations as earth stations authorized to communicate with U.S.-licensed space stations. *See, e.g.*, OneWeb 2019 Blanket Earth Station Application for User Terminals, IBFS File No. SES-LIC-20190930-01237, Exhibit A, Narrative Statement (filed Sept. 30, 2019) (OneWeb incorporates by reference the OneWeb Market Access grant to demonstrate compliance with the requirements of section 25.137 of the Commission's rules for earth station applicants proposing to communicate with non-U.S.- licensed space stations). The earth station license was granted with a license term of 15 years. IBFS File No. SES-LIC-20190930-01237 (granted Apr. 29, 2021).

<sup>222</sup> 47 CFR § 25.121(e).

<sup>223</sup> *See id.* § 1.949(d).

<sup>224</sup> *See id.* § 1.949(f).

<sup>225</sup> *See id.* § 1.949(h).

<sup>226</sup> *See id.* § 1.949(d).

<sup>227</sup> *See* 47 U.S.C. § 309(i).

<sup>228</sup> *See, e.g., Service Rules for Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, WT Docket No. 12-357, Report and Order, 28 FCC Rcd 9483, 9558-59, para. 195 (2013) (requiring 40% population coverage within four years of initial grant and 75% population coverage within 10 years of initial grant). *See also AWS-3 Report and Order*, 29 FCC Rcd at 4659-60, para. 135 (requiring 40% population coverage within six years of initial grant and 75% population coverage within 12 years of initial grant); *Expanding the Economic and Innovation*

(continued....)



must consider what type of performance requirements should apply to the licensees involved in this new framework.

101. In terrestrial wireless services, spectrum lessees do not have construction or operational requirements separate from the spectrum lessor's responsibilities. For example, in spectrum manager leasing arrangements and long-term *de facto* transfer leasing arrangements, any performance requirements remain a condition of the underlying license, and the lessor's legal responsibility for compliance cannot be delegated to the lessee.<sup>229</sup> The Commission enforces the applicable performance requirement against the licensee.<sup>230</sup> In the proposed SCS approach, the spectrum lessee would be the satellite operator and, at least pursuant to existing terrestrial service rules, would not have independent performance requirements.

102. Section 25.164 of the Commission's rules describes the milestones applicable to recipients of licenses for an NGSO satellite system.<sup>231</sup> Specifically, NGSO satellite system authorizations require the launch of 50 percent of the maximum number of space stations and operation of the stations no later than six years after grant of the authorization, with the launch of the remaining stations occurring no later than nine years after grant.<sup>232</sup> We propose to retain the satellite spectrum milestones applicable to current part 25 NGSO satellite operators to provide SCS. We seek comment on our proposal, including its costs and benefits. Should application of current milestones differ if the proposed modification seeks to add frequencies for the provision of SCS, but does not request the addition of more space stations (i.e., because the number of required satellites in a constellation may have been previously authorized)? Would our proposal promote prompt and efficient spectrum usage in the public interest? Alternatively, should we consider modifying these existing milestones relative to the supplemental coverage we propose today? What modifications would be warranted to ensure efficient satellite usage and prevent warehousing? Moreover, should we revise our rules to address the interplay between satellite milestones and terrestrial performance requirements, and if so, how?

103. We also note that, pursuant to section 25.165 of the Commission's rules, space station licensees generally must post a surety bond within a certain time period after grant of the license, and failure to post a bond causes the license to be rendered automatically null and void.<sup>233</sup> We propose to apply the bond requirements applicable to current part 25 NGSO satellite operators to the satellite operators seeking to provide SCS.<sup>234</sup> We seek detailed comment on these issues, including the associated costs and benefits. Are any modifications needed to these requirements? In particular, how can we promote competition and deter companies from effectively blocking future competition by failing to follow through promptly with their deployment plans? Would more stringent milestone or bond requirements be appropriate in conjunction with the provision of SCS?

104. Section 25.133 of our rules requires an earth station or network of blanket-licensed earth stations to be brought into operation within 12 months after initial licensing, or six months after the bringing into operation of the NGSO system under section 25.164(b)(1) with which the earth station or earth station network was authorized to communicate, unless a different build-out period is determined by the Commission.<sup>235</sup> We note that our WRS rules provide no corresponding specific build-out requirement

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*Opportunities of Spectrum through Incentive Auctions*, GN Docket No. 12-268, Report and Order, 29 FCC Rcd 6567, 6877-78, para. 764 (2014).

<sup>229</sup> See 47 CFR §§ 1.9020(d)(5), 1.9030(d)(5).

<sup>230</sup> *Id.*

<sup>231</sup> See *id.* §§ 25.164(a), (b)(1)-(2).

<sup>232</sup> *Id.*

<sup>233</sup> See *id.* § 25.165.

<sup>234</sup> See *id.*

<sup>235</sup> See 47 CFR § 25.133(a); see also 47 CFR § 25.164(b)(1).

for terrestrial end-user devices, such as handsets, because authority for subscribers to operate mobile or fixed stations, with certain exceptions, is included in the authorization held by the licensee providing service. As noted, our WRS rules typically require the terrestrial licensee to meet performance requirements and offer service.<sup>236</sup> Should we apply a similar 12-month period to bring terrestrial devices into operation that are also licensed under a blanket earth station license?<sup>237</sup> Is this necessary to ensure prompt supplemental coverage, or would this conflict with existing performance requirements applicable to the terrestrial licensee? Should we specifically apply those performance requirements for purposes of bringing terrestrial devices into operation under the earth station license?

105. *Automatic Termination.* To promote spectrum efficiency, the Commission establishes performance requirements or deployment milestones, depending on the radio service, with attendant consequences for failing to timely meet the requirements. The Commission also defines permanent discontinuance of service resulting in automatic license termination.<sup>238</sup> For geographic-area terrestrial licensees authorized by market, for example, permanent discontinuance of service or operations is defined as 180 consecutive days during which a licensee does not operate or, in the case of CMRS providers, does not provide service to at least one subscriber that is not affiliated with, controlled by, or related to the licensee.<sup>239</sup> The Commission's permanent discontinuance rule is intended to work in concert with its construction and renewal obligations "to ensure that licensees provide service in a timely manner, continue to provide service over the term of the license, and do not discontinue service for such an extended period of time that it should be deemed permanent."<sup>240</sup> Similarly, for part 25 satellite operators, the Commission has adopted an automatic termination rule that describes the consequences for failing to meet applicable milestones.<sup>241</sup> Specifically, a station authorization will automatically terminate for failure to maintain the 50 percent of the maximum number of NGSO space stations authorized for service following the 9-year milestone period, which failure will result in termination of the stations not in orbit on the date of noncompliance.<sup>242</sup> Station authorizations will also terminate for the removal or modification of the facilities, which renders the station not operational for more than 90 days.<sup>243</sup>

106. We propose to retain the current part 25 rules regarding automatic termination of station authorizations to satellite licensees seeking to provide SCS jointly with a terrestrial collaborator.<sup>244</sup> We seek comment on our proposal and whether any rule amendments are required in the public interest. For example, we recognize that, for the terrestrial licensee, the applicable part 1 rules governing permanent discontinuance of service set forth different standards and timeframes for determining what constitutes a discontinuance of service for purposes of license termination.<sup>245</sup> Given these differences, we seek comment on whether part 25 rule amendments are necessary to harmonize the terrestrial and satellite automatic termination standards, considering that the proposed new service is a joint offering intended to

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<sup>236</sup> See *id.* §§ 1.903(c), 27.14.

<sup>237</sup> See *id.* § 25.133(a).

<sup>238</sup> See *id.* § 1.953.

<sup>239</sup> See *id.* § 1.953(b).

<sup>240</sup> See *Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 to Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services*, WT Docket No. 10-112, Second Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 8874, 8894 (2017).

<sup>241</sup> See 47 CFR § 25.161.

<sup>242</sup> See *id.* § 25.161(d).

<sup>243</sup> See *id.* § 25.161(c).

<sup>244</sup> See *id.* § 25.161.

<sup>245</sup> See *id.* § 1.953.

supplement existing terrestrial coverage. Should more stringent requirements and shorter timeframes be applied to a satellite operator providing SCS? Further, should the terrestrial service provider in a proposed SCS collaboration be held to more rigorous discontinuance rules, necessitating part 1 rule revisions?

107. *Permissible Communications.* Our proposed licensing framework for the provision of SCS involves the addition of MSS allocations to previously terrestrial-only spectrum. Many of our WRS rules applicable to terrestrial operators set forth parameters for permissible, or required, communications on terrestrial spectrum. For example, rule section 24.3 permits a PCS licensee to provide any mobile communications service on its assigned spectrum;<sup>246</sup> rule section 22.901 requires that an 800 MHz Cellular Radiotelephone Service licensee provide either mobile service, fixed service, or a combination thereof;<sup>247</sup> and rule section 27.2 provides that WCS licensees, with some exceptions, may provide any services for which their frequency bands are allocated, as indicated in the U.S. Table.<sup>248</sup> Our proposed SCS framework, intended to close terrestrial service coverage gaps, would specifically permit the provision of MSS through space station transmissions authorized under part 25 of the Commission's rules. Although we require a satellite operator to enter into a leasing arrangement with a terrestrial licensee as part of our proposed entry criteria to provide SCS, we recognize that the transmissions necessary to supplement terrestrial coverage are not generated by the terrestrial licensee authorized under our WRS rules. As a result, we tentatively conclude that it is unnecessary to revise our parts 22, 24, and 27 rules related to permissible communications to enable the provision of SCS. We seek comment on this tentative conclusion.

108. *Other Existing Obligations.* We seek comment on whether any other existing service rule obligations applicable to terrestrial providers offering commercial service in the flexible-use bands specified above need to be addressed in our proposed part 25 licensing framework. In establishing service rules in other proceedings, the Commission typically seeks to achieve regulatory parity and to provide flexibility as much as possible, while accommodating differences in particular bands where necessary. Are there public interest reasons that part 25 satellite operator/lessees should be subject to additional terrestrial licensee partners' service obligations? For example, should our roaming rules in part 20<sup>249</sup> apply to a satellite operator providing SCS under our proposed framework? Are these rules relevant in a scenario where we propose SCS as an enhancement to existing terrestrial service and not a standalone service where SCS would initially be authorized throughout a given GIA? We ask commenters that support modifying any existing obligations, as applied to the terrestrial licensees or the satellite operators, to articulate the reasons why different treatment here is justified. We also propose to apply current part 25 obligations to an applicant seeking authorization modification as part of a collaboration with a terrestrial licensee, such as section 25.114 requirements regarding applications for space station authorizations, including submitting a plan describing the design and operational strategies that will be used to mitigate orbital debris. We seek comment on this proposal. Are there any part 25 rules that may be inconsistent with our proposed framework? Commenters should be specific regarding any requested changes to the rules, including support for why the rule should not apply to our proposed SCS framework or should be modified.

109. *Potential New Obligations.* In conjunction with our proposal to permit use of valuable terrestrial spectrum to provide SCS, we must consider whether there are new obligations that should be imposed on collaborating licensees. Specifically, we seek comment on whether—in jointly authorizing SCS through a satellite authorization modification and a lease of terrestrial exclusive-use licenses—the Commission should consider creating new or additional obligations in the public interest. Further, we

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<sup>246</sup> See *id.* § 24.3.

<sup>247</sup> See *id.* § 22.901.

<sup>248</sup> See *id.* § 27.2(a).

<sup>249</sup> See *id.* § 20.12.

seek comment on the appropriate parties upon which to apply any such obligations. For example, should we impose accelerated satellite deployment milestones or enhanced terrestrial coverage requirements, to ensure SCS is more rapidly made available to the public? Would applying quality of service metrics to SCS promote the public interest? We seek specific comment on the costs and benefits of imposing new or additional obligations on stakeholders in the context of authorizing SCS.

## 5. Technical Issues

110. Under our proposed framework, a satellite operator would enter into a lease arrangement with a terrestrial licensee. Under our current secondary markets rules, a lessee would typically be subject to the same technical requirements as the lessor, as set forth in band-specific service rules (e.g., complying with out-of-band emission limits to protect adjacent band licensees).<sup>250</sup> In this section, we discuss certain technical considerations applicable to the provision of SCS.

111. *Terrestrial Partners with Existing Lease Arrangements.* Where a terrestrial licensee holds all relevant co-channel licenses in a GIA, but has pre-existing lease arrangements with lessees (other than its collaborating satellite operator) in any of its licensed areas making up the GIA, we expect that the terrestrial licensee, as lessor, will afford necessary protections to its lessees to account for its co-channel satellite collaborator's transmissions entering the market. Currently, in spectrum manager leasing arrangements, through contractual provisions and oversight and enforcement of such provisions, the licensee must act in a manner sufficient to ensure that the spectrum lessee operates in conformance with applicable technical and use rules governing the license authorization.<sup>251</sup> The licensee's responsibilities include overseeing the spectrum lessee's system "to ensure compliance with Commission rules regarding non-interference with co-channel and adjacent channel licensees ...."<sup>252</sup> Further, the licensee is responsible for resolving all interference-related matters, including conflicts between its spectrum lessee and any other spectrum lessee or licensee (or authorized spectrum user).<sup>253</sup>

112. We seek comment on the sufficiency of an approach that relies on a terrestrial licensee, in collaboration with a satellite operator to provide SCS, to protect its pre-existing lessees from harmful interference through engineering solutions specified in lease terms and conditions. Should we modify our rules to further protect a terrestrial licensee/lessor's pre-existing lessees from potential harmful interference from the operations of a new lessee satellite operator and what are those necessary protections? Given the technical complexity in the interference environment created by additional co-channel entities within a GIA, should we prohibit future terrestrial leasing arrangements after a terrestrial licensee has entered into a lease for SCS in a GIA? If we allow future leasing within a GIA that is leased for SCS operations, should we allow the parties to contract for necessary protections, or should we amend our rules to provide additional protections against harmful interference? We seek comment on whether additional technical protections are necessary in these contexts, and if so, we request that commenters be specific regarding what protections are warranted.

113. *In-Market Downlink Power Flux Density (PFD) Limits.* We propose a framework with entry criteria that would permit satellite operators and terrestrial collaborators to enter into private contractual agreements to establish necessary protections for their respective co-channel operations to provide SCS using spectrum previously allocated for terrestrial-only use. Some satellite operators have

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<sup>250</sup> See, e.g., *id.* §§ 24.236, 24.238.

<sup>251</sup> See *id.* § 1.9010(b)(1)(i).

<sup>252</sup> *Id.* § 1.9010(b)(1)(ii).

<sup>253</sup> *Id.*

indicated that their satellites can produce narrow spot beams that focus signal energy on small unserved areas of terrestrial markets, without otherwise impinging on the terrestrial licensee's operations.<sup>254</sup>

114. We note that part 25 does not provide PFD limits in terrestrially allocated bands at issue in this Notice, and parts 24 and 27 base station power limits would not be appropriate to regulate satellite downlinks. Therefore, we seek comment on an appropriate in-band PFD limit that should be applied to each of the bands in which SCS is contemplated. We further note that the ITU Radio Regulations include PFD limits for various satellite downlink operations in different bands to enable coexistence between different services.<sup>255</sup> Should we implement in-market PFD limits for the bands under consideration in this Notice or should we allow these technical details to be negotiated between satellite and terrestrial partners? If we allow privately negotiated in-market PFD limits as proposed, should we require the SCS partners to specify in their lease notifications the PFD limit to which they agreed? Regardless of the approach we take, would an appropriate in-band PFD limit be based upon whether the downlink signal only operates in areas unserved by the terrestrial system or is there a need for other PFD limits in areas that potentially have overlapping coverage? We recognize that a variety of factors (e.g., partners' service plans, network configuration, and technological developments) could affect the amount of satellite energy present on the ground in a given service area. Should we establish additional technical rules to ensure terrestrial services are not degraded? Commenters making proposals for technical limits on satellite signals within authorized markets should include technical justifications for their proposals and analyses demonstrating that terrestrial services would not be degraded by supplemental operations.

115. *Market Area Boundary Limits.* We do not believe it necessary to amend the existing market area boundary limits in parts 22, 24, and 27 of the Commission's rules, respectively, in the context of SCS.<sup>256</sup> We recognize that co-channel neighbors in our proposed SCS context are not two licensees operating terrestrial base stations in adjacent geographic areas that share a common terrestrial boundary. Rather, our proposed entry criteria ensure that a single terrestrial licensee holds all relevant co-channel licenses in a GIA, and that the co-channel "neighbor" seeking to provide coverage in proximate geography is a collaborating satellite operator. We anticipate that a terrestrial licensee and its co-channel satellite partner seeking to provide SCS would coordinate regarding technical parameters to jointly ensure that their co-channel operations do not cause harmful interference to one another. We recognize, however, that boundary limits may be applicable at the margins of a GIA, for example, at international borders through treaty obligations, or at a market boundary extending into water. We seek comment on this approach, including the associated costs and benefits.

116. We note that the existing technical rules for each radio service were tailored to account for the allocations in the band(s) where the services were authorized to operate. Where, as here, we propose to modify the allocation to facilitate supplemental coverage, such new operations could raise technical issues that were not anticipated when technical rules were initially adopted for a service. Accordingly, given the novel satellite use of terrestrial spectrum, we seek comment on whether, in a framework requiring a single licensee to hold relevant co-channel spectrum rights throughout a GIA, modified or additional technical protections are required, as well as the costs and benefits of any alternative approach.

117. *Out of Band Emission (OOBE) Limits.* To protect against harmful interference to adjacent band licensees, we propose to apply the existing OOBE limits for the relevant band of operation

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<sup>254</sup> See SpaceX and T-Mobile Application, Technical Annex at 9 (indicating SpaceX and T-Mobile have agreed to an unspecified in-market PFD limit for their proposed joint operations).

<sup>255</sup> See, e.g., Recommendation ITU-R SF.358-5, Maximum Permissible Values of Power Flux Density at the Surface of the Earth Produced by Satellites in the Fixed Satellite Service Using the Same Frequency Bands Above 1 GHz as Line-of-Sight Radio Relay Systems.

<sup>256</sup> See 47 CFR §§ 22.983, 24.236, 27.55.

for satellite transmitters providing space-to-Earth transmissions.<sup>257</sup> While section 25.202 provides a range of OOB limits, from relaxed narrowband emissions to stringent emissions for other bands,<sup>258</sup> we propose to implement the current terrestrial service rule OOB limits deemed necessary to protect adjacent operations in the relevant bands of operation. We note that the pending T-Mobile/SpaceX proposal contends that their satellite system was designed to meet the PCS Block G requirements in rule section 24.238,<sup>259</sup> which is a stricter limit than certain emission limits permitted for satellites in rule section 25.202.<sup>260</sup> We seek comment on our proposal and whether the emissions limits pertaining to satellites should be different than those currently applied to terrestrial base station emissions in each relevant band. We recognize that, in many bands, terrestrial-only operations are more viable with coordination or spectrum separation, and that satellite downlinks may not be viable in all cases. Are our current terrestrial OOB limits sufficient to protect the range of adjacent band services if these limits are applied to new supplemental satellite operations? Are additional OOB limits required for satellite transmissions to protect Federal receivers in space? Commenters should address specific concerns and potential solutions for each band of concern.

118. We also acknowledge that the interference metrics are different for satellite transmissions insofar as near-far interference caused by the proximity of an adjacent band device to a terrestrial base station is not present in SCS. However, a satellite signal can place undesired signal energy into adjacent bands and can cover large geographic areas, potentially affecting many terrestrial and space-based devices. While this undesired signal may not rise to a level of causing harmful interference, it could degrade adjacent licensees' operations and cause dropped calls for those at the outer edges of coverage. Accordingly, we seek comment on how satellite downlinks meeting existing terrestrial OOB limits would affect adjacent channel operations if the satellite downlinks become widespread. That is, would satellite downlinks meeting current terrestrial OOB limits across a large portion of an adjacent channel licensee's service area raise the noise floor or potentially harm adjacent channel services? Would the effect be limited in scope or potentially affect a significant portion of adjacent channel operations? We also seek comment on whether certain applications require changes to our OOB limits. For example, section 27.53 of our rules, which is applicable to various 700 MHz blocks, requires a resolution bandwidth of 30 kilohertz for emissions immediately outside the band edge, instead of the often used 1% of the emission bandwidth standard.<sup>261</sup> As a result, any technology, such as NB-IoT, with a bandwidth less than 3 megahertz is required to meet a stricter limit. Should we adjust the resolution bandwidth for 700 MHz devices to enable narrowband applications? Commenters supporting different emission limits for satellite downlinks should make specific proposals, supported by technical justifications and analyses on how those emissions would affect adjacent channel operations.

119. *Elevation Angle for Satellite Downlinks.* Further, our proposal limits terrestrial and satellite collaborations seeking to supplement terrestrial service to the use of NGSO satellites. As these satellites move across the sky, their signal beams will also move to provide service and will be arriving on the ground from varying elevation angles. Our part 25 rules often use elevation angle limits on earth stations to facilitate sharing with terrestrial operations.<sup>262</sup> We recognize that under our proposed SCS framework, all relevant co-channel licenses in a given GIA must be held by the terrestrial licensee, and that collaborating terrestrial and satellite operators will coordinate to prevent harmful interference. Is this approach sufficient to avoid harmful interference, including protection for spectrally adjacent licensees?

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<sup>257</sup> See *id.* §§ 22.917, 24.238, 27.53.

<sup>258</sup> See *id.* § 25.202.

<sup>259</sup> See Technical Narrative attached to T-Mobile and SpaceX Application at 11; see also 47 CFR § 24.238.

<sup>260</sup> See 47 CFR § 25.202.

<sup>261</sup> See *id.* § 27.53(g).

<sup>262</sup> See, e.g., *id.* § 25.205.

Should we establish a minimum elevation angle to minimize focused signal energy into terrestrial base station antennas? If so, what elevation angle would be appropriate, e.g., 5 degrees? We seek comment on this and other alternatives that might be necessary to minimize the potential for harmful interference.

120. *Other Technical Limits.* We seek comment on the applicability of other technical limits that currently apply to terrestrial operations in each of the subject bands proposed for SCS. For example, should we apply the existing frequency stability, duty cycle, synchronization requirements and other limits that apply to terrestrial base stations and terrestrial devices, as set forth in the service rules for the respective band of operation, to new SCS operations? Are there factors in the existing technical limits that could hinder the range of services we explore in this Notice? Would it be feasible or necessary to apply one set of technical limits when communicating with terrestrial towers, but a different set of technical limits when communicating with a satellite? If existing technical limits are insufficient to protect against harmful interference caused by the types of partnered supplemental operations we propose in this Notice, commenters should offer specific limits, with a justification of why those limits are needed and an analysis of how they might impact adjacent operations in the bands under consideration. With respect to additional technical rules pertaining to base stations, we note that section 25.202 specifies frequency bands, frequency tolerance, and OOB limits for certain satellite operations. Given our proposals to: (1) add a footnote allocation to the U.S. Table; and (2) apply various technical limits from parts 22, 24, and 27 to MSS downlinks depending on the band of operation, we seek comment on the applicability of various base station technical limits on supplemental space station operations. For example, section 27.50 specifies a range of base station power limits, coordination requirements, power measure methods, tower height limits, peak-to-average ratio limits, and other limits applicable to the bands under consideration in this Notice.<sup>263</sup> We seek comment on the extent to which SCS operations can be effectuated in compliance with these restrictions. Further, we seek comment on the applicability to SCS of section 25.203 regarding frequency and location choice in bands shared by satellite and terrestrial services, including whether we should create an exception for MSS operations that provide SCS.

121. Also, as our proposal seeks to afford flexibility to subsequently add bands for SCS operations, where our proposed entry criteria subsequently are able to be met, is there an efficient way to incorporate by reference into part 25 applicable base station limits applicable to satellite downlink operations? Alternatively, should various bands, entry criteria, and technical requirements be listed in part 25 and if so, where? Or is it more efficient simply to include a cross reference to the proposed footnote to the U.S. Table, where entry criteria and other specifications would be specified?

122. We also seek comment on the applicability to SCS of various coordination, notification, and other rules applicable to 800 MHz cellular terrestrial base stations to protect public safety operations. As an SCS signal originates from space, public safety operations would not be subject to, as discussed, the “near-far interference” situation caused by operations near a terrestrial base station. To help resolve the near-far issue and protect public safety, the Commission, among other actions, implemented sections 22.913(b) and (c), 22.970, 22.971, 22.972, and 22.973.<sup>264</sup> These rules may not directly apply to SCS downlink transmissions, but we nonetheless seek comment on whether some form of accommodation is needed for SCS at 800 MHz or any other bands adjacent to public safety operations to ensure the continued reliability of public safety networks and avoid harmful interference.

123. *Protection of Radio Astronomy and Space Sciences.* The novel aspects of our proposal introduce new spectrum management challenges that warrant consideration, including the introduction of satellite downlinks and the continuing need to protect radio astronomy and other services that may be susceptible to signals emanating from the sky. The advent of new technologies presents an opportunity to explore satellite downlinks in a range of previously terrestrial-only bands provided proper safeguards are in place. In general, terrestrial operations in bands adjacent to radio astronomy have proven viable with

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<sup>263</sup> See *id.* § 27.50.

<sup>264</sup> See *id.* §§ 22.913(b)-(c), 22.970, 22.971, 22.972, 22.973.

coordination requirements, and because highly directional radio astronomy antennas point to the sky and are protected from terrain obstacles. These spectrum management tools do not exist (e.g., terrain) or are complicated (e.g., coordination and angle of arrival)<sup>265</sup> in the case of satellite operations.

124. IB addressed this type of situation in the recent Lynk Order, where the National Radio Astronomy Observatory (NRAO) opposed Lynk's application to operate in the 600 MHz band due to its potential to interfere with radio astronomy operations in the lower adjacent band.<sup>266</sup> After reviewing the record, IB granted the application for operations outside the United States with various conditions, including Lynk providing 180 dB of signal isolation to radio astronomy facilities, a minimum of 3 megahertz of frequency separation, and on Lynk avoiding space-to-Earth transmissions into Radio Quiet Zones in the United States and on a global basis consistent with protection measures necessary for individual Radio Quiet Zones.<sup>267</sup> Generally, NRAO remains concerned about the impact of space radiocommunication in mobile service spectrum in terms of its potential to undermine the protections for radio astronomy, and has separately filed a petition for declaratory ruling or rulemaking requesting that the Commission address these concerns.<sup>268</sup>

125. Section 1.924 of the Commission's rules applies to WRS applications and requires the coordination of fixed terrestrial wireless transmitters (including those operating in the terrestrial bands under consideration in this Notice) to protect a number of sensitive facilities.<sup>269</sup> Although our part 25 rules address some protections to certain scientific facilities or bands,<sup>270</sup> section 1.924 does not specifically address satellite downlink operations.<sup>271</sup> Further, although we propose to apply terrestrial OBE limits to satellite downlink operations as discussed above, such limits may not be sufficient to protect sensitive scientific services, depending on the bands for which we ultimately may authorize SCS.

126. Accordingly, we seek comment on whether existing rules addressing the protection of sensitive operations would be adequate in the context of the provision of SCS, and whether we should consider updated approaches to maintaining the unique characteristics of the areas covered by section 1.924. Specifically, what new coordination requirements would be necessary for radio astronomy stations in certain geographic locations to enable the same level of protection currently afforded via coordination with terrestrial systems? Should we implement conditions similar to those applied in the Lynk Order in the SCS context? Should we adopt more stringent OBE limits for these situations and if so, what should they be? Should we amend section 1.924 or part 25 to require supplemental satellite downlink or other operations to coordinate with the facilities specified in section 1.924 and section 25.203? Could such coordination successfully take into account the dynamic nature of NGSO satellites, including their operation across the entire globe, with capabilities such as steerable spot beams and flexible frequency use, thereby protecting the sensitivity and varying nature of scientific observations looking to the sky? Should we be concerned about the aggregate impacts of multiple systems providing SCS, and if so, what

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<sup>265</sup> See, e.g., 47 CFR § 2.106 n.US131 (requiring NGSO FSS (space-to-Earth) licensees operating in the 10.7-11.7 GHz band to coordinate with multiple radio astronomy observatories to achieve a mutually acceptable agreement to protect adjacent band radio telescope facilities).

<sup>266</sup> See *Lynk Order* at paras. 22-25.

<sup>267</sup> *Id.*

<sup>268</sup> See Petition of NRAO for Declaratory Ruling or Rulemaking (filed Feb. 8, 2023), <https://www.fcc.gov/ecfs/document/10208273939421/1> (NRAO Petition). NRAO specifically requests that the Commission issue a declaratory ruling or initiate a rulemaking proceeding to clarify the status, class of service and conditions under which terrestrial mobile phones operate when they are used for space radiocommunication in spectrum bands allocated to the mobile service. See *id.* at 3, para. 16.

<sup>269</sup> 47 CFR § 1.924.

<sup>270</sup> See, e.g., 47 CFR §§ 25.203(e-f), 25.142(a)(2), 25.254.

<sup>271</sup> See 47 CFR § 1.924.



additional information would be necessary to address any concerns? What is the appropriate approach to ensure that SCS can supplement existing terrestrial services and adequately protect the Nation's valuable scientific enterprise? Are other rule changes required? We seek comment on all aspects of this issue so that we might facilitate SCS while preventing harmful interference to sensitive passive services, such as radio astronomy and Earth exploration.

127. *Terrestrial Device Power Limits.* We propose to maintain the current power limits applicable in each band to a range of terrestrial devices that would also be licensed as earth stations under SCS operation. We therefore propose to amend section 25.204 (power limits for earth stations) to reflect that SCS earth stations would be required to meet the power limits applicable to terrestrial transceivers for the bands in which they seek to operate.<sup>272</sup> We seek comment on this proposal, in particular how such existing power limits would work, in practice, for the proposed SCS, given that consumer devices often do not operate at maximum power limits currently permitted because of other limiting factors, such as battery life. As device standards and designs change, would existing power levels be sufficient for mobile devices to communicate with satellites? How could the proposed SCS be leveraged to provide fixed broadband services to unserved areas, which continues to be a challenge in many areas? Are existing device power limits sufficient to make applications for the provision of fixed broadband in rural or unserved areas feasible? Commenters should provide technical details for their suggestions and provide analysis supporting their proposals and evaluate the impact of their proposals on other services.

128. *Equipment Authorization for SCS.* Our terrestrial (parts 22, 24, and 27) and satellite (part 25) service rules require all transmitting devices to meet the relevant technical rules and receive equipment authorization.<sup>273</sup> Accordingly, for new devices certified after the effective date of any rules adopted in this proceeding, we propose to require that the equipment certification applicant specifically seek certification under part 25<sup>274</sup> as well as the relevant terrestrial rule part(s) for all intended uses of the device. To receive part 25 equipment authorization, the applicant is required to demonstrate through testing that the device meets the technical requirements under the relevant terrestrial service rules. We do not believe this will add additional cost or time for equipment certification because no additional testing beyond the testing done to show compliance with existing terrestrial rules parts would be required under our proposal. We seek comment on this proposal and any alternatives, including the costs and benefits. In addition, if we adopt different technical rules for terrestrial transmitters specifically for operation with satellites for SCS, should those technical rules be in part 25 or identified for SCS in the terrestrial service rules, and how should the equipment authorization process change from our proposal?

129. We recognize, however, that there are a significant number of terrestrial devices that have already received equipment authorizations, which terrestrial licensees may choose to serve using SCS. We believe it is impractical and would not provide a tangible benefit to require re-certification of such devices to add part 25 SCS to existing equipment certifications, so long as the provision of service to such existing devices would not require technical modifications. Accordingly, for purposes of equipment authorization, we propose to treat as authorized-by-rule under part 25 existing terrestrial devices designed for use in the relevant flexible-use bands that are intended for SCS use, and we propose not to require a separate equipment authorization for such existing devices under part 2. However, if the Commission adopts rules for terrestrial devices that differ from existing rules that permit terrestrial operation (e.g., additional power for SCS), devices modified to operate under any new rules where the new rules would permit emissions to exceed current technical limits would be required to be recertified under the relevant rule part(s). We also propose to direct OET to use its delegated authority to administer the Equipment Authorization program to take all appropriate actions to implement our decisions. We seek comment on this proposal and its costs and benefits. Would another approach be more practical? For example, should

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<sup>272</sup> See proposed section 25.204(g) in Appendix A.

<sup>273</sup> See 47 CFR §§ 22.377, 24.51, 25.129, 27.51.

<sup>274</sup> See *id.* § 25.129 (Equipment authorization for portable earth-station transceivers).

we require manufacturers to seek permissive changes to their equipment authorization for existing devices to add part 25 usage to existing equipment?

130. *3GPP and Other International Efforts.* We are aware that the 3GPP standards group is exploring similar applications of satellite service to handsets, which it refers to as NTN for broadband and NB-IoT applications.<sup>275</sup> These discussions, however, are primarily focused on incorporating bands allocated for satellite services into terrestrial devices.<sup>276</sup> For example, there are some initial studies exploring coexistence in the S band and for operation above 10 GHz, including the Ka-band.<sup>277</sup> We recognize, nonetheless, that some of the bands under consideration by 3GPP, such as the S band and the Ku-band, include overlapping terrestrial allocations. Thus, we seek comment and stakeholder input on the status of any work being done by 3GPP to address interference and other concerns associated with satellite-based operations in flexible-use spectrum currently designated for terrestrial networks, and whether any such work should be incorporated by the Commission through this proceeding. Are other organizations, such as the ITU or the European Telecommunications Standards Institute, examining these issues? We seek comment on other efforts, both domestically and internationally, to establish standards or conduct related work regarding satellite service to handsets.

### C. International Coordination

131. As stated, we propose to apply to SCS operations all existing signal level limits and coordination requirements that apply to the subject terrestrial bands.<sup>278</sup> We reiterate that any limit we ultimately adopt in this proceeding will be subject to current and future agreements reached with border countries. Further, as many of the terrestrial bands proposed for SCS are not allocated for mobile-satellite service use internationally, any such use would be considered a non-conforming use under the ITU Radio Regulations. Accordingly, SCS operations could only be conducted on the condition that a station using such a frequency assignment shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, an international station operating in accordance with the provisions of the Constitution, the Convention, and the Radio Regulations of the ITU.<sup>279</sup>

132. Further, use of the bands identified in this Notice in the United States or its territories near international borders are subject to international agreements, with various rules and restrictions depending on the spectrum band and type of operation.<sup>280</sup> These restrictions are subject to bilateral

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<sup>275</sup> See 3GPP TR 38.821, Solutions for NR to Support Non-Terrestrial Networks (NTN) (Release 16), <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3525>; 3GPP TR 38.863, Solutions for NR to Support Non-Terrestrial Networks (NTN): Non-Terrestrial Networks (NTN) Related RF and Co-Existence Aspects (Release 17), <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3926>.

<sup>276</sup> We recognize that one application of NTN as defined in 3GPP is the use of High Altitudes Platforms (HAPS) to provide access to a user terminal. As noted, however, this proceeding does not propose, or seek comment on, the inclusion of HAPS within the SCS framework. See *supra* note 93.

<sup>277</sup> 3GPP RP-222812, Status Report for WI NR NTN (Non-Terrestrial Networks) Enhancements.

<sup>278</sup> See, e.g., *id.* §§ 22.169, 22.983(c), 24.236, 27.55, 27.57.

<sup>279</sup> See ITU Radio Regulations Article 4.4, Edition of 2020 (stating that “Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.”).

<sup>280</sup> See, e.g., FCC, *Canadian Agreements by Frequency*, <https://www.fcc.gov/canadian-agreements-frequency> (last visited Sept. 6, 2022); FCC, *Mexican Agreements by Frequency*, <https://www.fcc.gov/mexican-agreements-frequency> (last visited Sept. 6, 2022).

agreements<sup>281</sup> that typically focus on ensuring that terrestrial licensees meet a particular signal level limit at the relevant international border (e.g., field strength limit or PFD), unless licensees and the relevant agencies agree to alternative limits along with, in some cases, a coordination requirement for base stations placed within a certain distance of the border.<sup>282</sup> Although existing bilateral agreements do not contemplate SCS in these terrestrial bands, we believe appropriate limits on cross-border transmissions from supplemental satellite operations will prevent harmful interference to operations across international borders. Given the need to comply with existing Treaty obligations relative to SCS operations, we seek comment on appropriate cross-border protections for SCS operations.

133. We also recognize that interference metrics are different between satellites and terrestrial stations and that any interference analysis must be band-specific. Therefore, we seek comment on appropriate procedures for these analyses, as well as the relevant factors to include for specific bands. For example, we seek comment on whether we should look to relevant parts of the ITU Radio Regulations, including Resolutions addressing bands that are shared between terrestrial mobile and SCS operations.<sup>283</sup> We seek comment on the use of the guidance found in these resolutions in our efforts to ensure that the potential for harmful interference is not increased across our borders.

134. In implementing our proposal, we also seek comment on the viability of coordination between domestic satellite operators and terrestrial operators in bordering countries. Should we consider allowing deviations from our signal strength limits where such agreements can be reached? What other

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<sup>281</sup> As these agreements are bilateral, agreements covering the Canadian/U.S. and Mexican/U.S. borders may use different technical rules for the same bands. For example, the 700 MHz agreements between the United States and Canada requires coordination of base stations within 120 km of the border. If there is no base station within 120 km of the other side of the border, then a power flux density (PFD) of no more than -96 dBW/m<sup>2</sup> in any 1 MHz bandwidth in the other country's territory would apply. If there is another licensee on the other side of the border and no agreement is met, then a PFD of no more than -116 dBW/m<sup>2</sup> in any 1 MHz bandwidth would apply. In contrast, the U.S. and Mexican 700 MHz agreement provides that licensees within 110 km of the border are limited to in-band emissions to -106 dBW/m<sup>2</sup> within the authorized bandwidth and out-of-band emission in the -120 dBW/m<sup>2</sup> per 1 kHz at any point at or beyond the common border, with higher limits permitted with mutual agreement. *See* Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 806-824 MHz, and 851-869 MHz by the Land Mobile Service Along the Canada-United States Border (Aug. 2011) (Arrangement F); Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 768-776 MHz and 798-806 MHz by the Land Mobile Service Along the Canada-United States Border (May 2013) (Arrangement Q).

<sup>282</sup> *See, e.g.,* Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 806-824 MHz, and 851-869 MHz by the Land Mobile Service Along the Canada-United States Border (Aug. 2011) (Arrangement F); Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of the Frequency Bands 768-776 MHz and 798-806 MHz by the Land Mobile Service Along the Canada-United States Border (May 2013) (Arrangement Q). We note that SpaceX/T-Mobile state in their pending application that SpaceX can “maintain PFD levels below the equivalent PFD value [converted from the field strength limits specified in section 24.236] at national borders and space downlink beams appropriately from those borders to protect primary terrestrial mobile operations from interference.” *See* Technical Narrative attached to T-Mobile and SpaceX Application at 11.

<sup>283</sup> For example, Resolution 212 (rev. WRC-19) outlines guidance on technical and operation measures that administrations should consider when deploying satellite or terrestrial mobile stations in the 1885-2025 MHz and 2110-2200 MHz bands. *See* Resolution 212 (REV.WRC-19) titled Implementation of International Mobile Telecommunications in the Frequency Bands 1885-2025 MHz and 2110-2200 MHz. In particular, the annex to this resolution provides examples of technical and operational measures to facilitate coexistence between terrestrial and satellite components of International Mobile Telecommunications in the frequency bands 1980-2010 MHz and 2170-2200 MHz.

border limits, conditions, or coordination should we adopt to ensure efficient and adequate transitions, and sufficient protection from harmful interference, at the borders? For example, we seek comment on how we should address the roaming of SCS-capable devices across the U.S. border where supplemental satellite operations are not authorized. Also, what steps may be needed if the border country also permits supplemental satellite operations? As discussed above, satellite propagation mechanics, angles of signal arrival, the dynamic nature of a satellite service resulting from moving transmitters, and other factors change how signals can affect border locations, and therefore site-by-site coordination may not be viable in every instance. Accordingly, commenters should address how SCS can operate near borders in compliance with international agreements and without impacting other service providers.

135. Finally, we note that certain bands under consideration in this Notice involve licenses that cover Alaska (including the Aleutian islands), Puerto Rico, Florida and the USVI, respectively. Depending on the scope of deployment and the bands ultimately permitted to provide SCS, satellite operations could impact co-channel or adjacent band operations, if any, in Russia, Cuba, and the British Virgin Islands. We seek comment on the appropriate protections in instances where countries do not have a common land border, but are adjacent over nominal water distances.

#### **D. Extension of Supplemental Satellite Framework to Additional Scenarios**

136. In this Notice, we propose a comprehensive and novel framework to enable transmissions directly between satellites and consumer handsets and other terrestrial devices using spectrum currently only available on terrestrial networks. We reiterate that, given key technical considerations, our initial proposal is limited to only spectrum and locations where (1) there is only one terrestrial entity that holds, either directly or indirectly, all co-channel licenses for the relevant frequencies in the given GIA (such as CONUS); and (2) there are no primary, non-flexible-use legacy incumbent operations (whether federal or non-federal) in the band. These limitations allow us to enable a potentially valuable supplemental service, while substantially minimizing the risks of harmful interference to the existing terrestrial networks on which so much of the nation's communications rely. As stated above, we will continue to consider filings made by interested parties, for example, requests for rule waiver, special temporary authority, and experimental authorization, relating to supplemental satellite coverage proposals, including those that do not meet the initial criteria we propose, during the pendency of this proceeding. Any action on such applications would be subject to the outcome of this proceeding.

137. We seek comment, however, on the potential for expanding our proposal to permit these innovative new operations in bands and in locations which do not meet the proposed entry criteria.<sup>284</sup> Commenters are encouraged to address technical and legal concerns with each deviation from our proposal, and to offer suggestions on ways we can modify our proposed framework in a given scenario to enable increased provision of SCS.

##### **1. Spectrum Bands with Non-Flexible-Use Incumbent Licensees**

138. We seek comment on whether it is possible to enable supplemental coverage from space in any bands that host non-flexible-use legacy incumbent operations other than those of the wireless licensee(s) seeking to offer SCS. We recognize that each such band will require individual analysis of the technical characteristics of the spectrum to be deployed, as well as the nature and location of the relevant incumbent operations, but we seek comment on whether there are common features among different bands that would allow us to enable SCS with similar rules.

139. For example, are there bands for which non-flexible-use incumbent operations are sufficiently localized such that protection zones would provide sufficient protection and, if so, what are

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<sup>284</sup> See, e.g., AST Mar. 3 *Ex Parte* Letter at 4-6 (expressing concern that the SCS framework is too limited and should include other scenarios, including spectrum where a single terrestrial wireless licensee does not hold all co-channel licenses in a given GIA); AT&T *Ex Parte* Letter at 1 (expressing the view that limiting SCS to spectrum bands where a single MNO holds all licenses in a given block across a GIA is too restrictive).

those zones and protection requirements? Alternatively, are there bands where the non-flexible-use incumbent operations are concentrated in particular areas (for example, CONUS) such that other GIAs (for example, Alaska) are free of such incumbents? An example for either scenario would be the AWS-1 and AWS-3 bands, which consist of paired sub-bands at 1710-1755 MHz and 2100-2155 MHz<sup>285</sup> and 1755-1780 MHz, and 2155-2180 MHz,<sup>286</sup> and an unpaired band at 1695-1710 MHz. All sub-bands are allocated in the U.S. Table for non-federal, primary, fixed and mobile use. All these sub-bands host federal systems at specific locations, which terrestrial networks are currently required to protect.<sup>287</sup> Similarly, the 1670-1675 MHz band is allocated and licensed for commercial wireless operations, but such operations must protect three federal earth stations through advanced coordination.<sup>288</sup>

140. For these and similarly-situated bands, what types of coordination requirements would be required, either in addition to, or as a replacement for, coordination requirements already applicable to terrestrial uses?<sup>289</sup> If we require licensees to provide proof of consent from potentially affected non-flexible-use incumbents as a condition of providing supplemental coverage, what terms should be included as part of these consent agreements to protect subscribers from service interruption? Given the nature of SCS as proposed, we encourage commenters to engage on the important consumer protection concerns that could arise. For example, how should we address circumstances where a terrestrial provider offers and potentially advertises a new capability for use in life-saving situations, which might be terminated without notice where an incumbent withdraws its consent?

## 2. Geographically Independent Areas Where Collaborating Terrestrial Licensees Hold All Co-Channel Licenses and Seek to Provide SCS

141. We seek comment on whether we should extend our proposal to include scenarios in which there are multiple unaffiliated flexible-use licensees in a given GIA, but all licensees in that area agree to jointly provide supplemental coverage from space to their customers in cooperation with a satellite provider. We seek comment on the likelihood, in this scenario, of stakeholders reaching agreements where all relevant terrestrial network operators would be coordinating to enable this innovative new capability without causing harmful interference. Is this most likely to occur in bands where one licensee holds the vast majority of the licenses in a given area?<sup>290</sup> Are there legal or technical concerns with expanding beyond a scenario where a single entity holds all co-channel licenses in the geographic area? How would market arrangements address issues concerning potential harmful

<sup>285</sup> See FCC, *Advanced Wireless Services (AWS-1) Band Plan*, <https://www.fcc.gov/sites/default/files/wireless/services/aws/data/AWS1bandplan.pdf> (last visited Dec. 22, 2022).

<sup>286</sup> See FCC, *AWS-3 Band Plans*, <https://www.fcc.gov/sites/default/files/wireless/services/aws/data/AWS3bandplan.pdf> (last visited Dec. 22, 2022).

<sup>287</sup> See 47 CFR § 2.106 nn.US91 & US378. Specifically, the AWS-3 band previously hosted a number of federal operations, with most of these operations being transitioned to other bands. *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, GN Docket No. 13-185, Report and Order, 29 FCC Rcd 4610, 4690-94, paras. 216-24 (2014). This transition began after the auction of these frequencies in 2015, and the transition is scheduled to be complete by 2025, leaving only a small number of legacy systems in the band. *Id.* The AWS-1 band hosts some legacy federal operations on a co-primary basis and is used by the National Aeronautical Space Administration (NASA)'s Deep Space Communications Complex in Goldstone, CA for radio astronomy observations. 47 CFR § 2.106 nn.US378 & US252.

<sup>288</sup> See 47 CFR § 2.106 n.US362.

<sup>289</sup> See, e.g., *The Federal Communications Commission and the National Telecommunications and Information Administration: Coordination Procedures in the 1695-1710 MHz and 1755-1780 Bands*, GN Docket No. 13-185, Public Notice, 29 FCC Rcd 8527 (WTB/NTIA 2014).

<sup>290</sup> For example, T-Mobile holds over 90% of the CONUS licenses for 600 MHz B, C, and D blocks, and DISH holds a similar proportion of the CONUS licenses for the Lower 700 MHz E block.

interference among several co-channel licensees and incursions on exclusive spectrum rights? What types of changes to our proposed SCS framework would be required were we to adopt such an expansion? We also seek comment on whether to permit SCS where a terrestrial licensee seeks to collaborate with more than one satellite provider. Are there reasons such an arrangement might be preferable or necessary to provide SCS (e.g., back-up coverage)? Would such an approach raise technical concerns, including increasing the complexity of providing SCS without causing harmful interference? What regulatory changes would be required to accommodate multiple satellite entrants seeking to collaborate with a terrestrial licensee? We seek comment on the practicality, costs, and benefits of expanding our proposal to allow this type of SCS configuration.

142. We seek comment on how to address issues where parties to a consortium withdraw from the collective agreement, resulting in non-participating co-channel licensees requiring protection in the geographic area. Should we require the consortium of licensees to cease SCS operations immediately upon one or more licensees withdrawing from the shared network agreement? This would ensure that licensees retain full exclusive use rights to their licensed frequencies in their licensed geographic area. Or should we place requirements on a continuation of SCS for a given period of time after withdrawal in order to protect consumers that rely on expanded coverage? Should we impose any requirements on the relative rights of different licensees to ensure comparable capability is provided to the customers of all participating terrestrial providers? What, if any, restrictions should we place on a terrestrial licensee's rights to terminate an agreement at-will or for cause? Should the Commission leave these decisions to the private negotiations among the parties?

143. Finally, we seek comment on the unique circumstances regarding the 2.5 GHz band. Although some licenses from Auction 108 have been issued for the 2.5 GHz band, the results indicate that T-Mobile may ultimately hold most licenses for a given co-channel block in some GIAs. We note, however, that the band also hosts a large number of Educational Broadband Service<sup>291</sup> licensees, many of which lease their spectrum rights to T-Mobile.<sup>292</sup> Further, the Commission enabled Tribal Nations to obtain access to the band through a priority window prior to commencement of the 2.5 GHz auction.<sup>293</sup> Accordingly, the auction results may not fully indicate the nature of T-Mobile's holdings in the band. Given these complexities, we did not include the 2.5 GHz band in our proposal, but we seek comment on whether SCS would be viable in the 2.5 GHz band. How would our proposed SCS framework accommodate a circumstance where the provider seeking to enable SCS is the lessee, not the lessor, of the relevant spectrum? What are the costs and benefits to allowing this service, and what, if any, different rules should apply to this or similar bands?

144. Commenters discussing SCS in bands where a licensee assembles access to all co-channel licenses throughout an entire GIA through agreements with other licensees should focus in particular on the potential harm to customers from the loss or interruption of supplemental coverage, and the potential for such coverage to be no longer provided due to competitive considerations. We seek to create incentives to foster SCS and therefore request that commenters address the extent to which imposing excessive restrictions would reduce contractual flexibility or reduce incentives to negotiate agreements to provide SCS.

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<sup>291</sup> See *Transforming the 2.5 GHz Band*, WT Docket No. 18-120, Report and Order, 34 FCC Rcd 5446 (2019) (2.5 GHz R&O). The 2.5 GHz band also hosts the Broadband Radio Service (BRS), but BRS licenses are adjacent, not co-channel, to 2.5 GHz licenses for Channels 1 and 2. While some BRS licenses cover frequencies that separate two parts of Channel 3, they are not co-channel with those operations. See FCC, *2.5 GHz Band Plan*, <https://www.fcc.gov/25-ghz-band-plan> (last visited Jan. 30, 2023).

<sup>292</sup> See *2.5 GHz R&O*, 34 FCC Rcd at 5474, para. 79 (noting that there are 2,087 active leases in the band for only 2,193 licensees and that “[t]he majority of [EBS] leases are with Sprint,” which is now part of T-Mobile).

<sup>293</sup> *Id.* at paras. 47-65.

### 3. Adjacent Geographic Areas Containing Non-Collaborating Licensees

145. Next, we seek comment on scenarios where the geographic area subject to potential SCS contains non-partner, co-channel licensees in adjacent markets located within a GIA. For example, a terrestrial wireless licensee that does not hold all co-channel licenses within a GIA, for example, CONUS, may nonetheless seek to collaborate with a satellite licensee to offer supplemental coverage to some portion of CONUS. Such scenarios can present complex legal and technical challenges, and we seek comment on how these challenges, particularly the potential for harmful interference to adjacent market, co-channel licensees that are in no way collaborating with the joint providers of supplemental satellite coverage, can be overcome. We also seek comment on whether the provision of such supplemental coverage is technically and/or financially viable without 100 percent CONUS coverage.

146. Of particular technical concern in these scenarios is the difficulty with which satellite-based transmissions can abide by our field strength limits at license area boundaries. Further, depending on the angle of transmission between the satellite and the ground,<sup>294</sup> the limit on emissions may in fact be exceeded above ground level, even if it not exceeded at ground level.<sup>295</sup> Should we apply our existing limits in parts 22, 24, and 27 to SCS operations in this context, recognizing the substantial difference in interference and propagation metrics of satellite signals versus terrestrial base station signals? We understand stakeholders may seek to deploy satellites using narrow spot beams to avoid harmful interference. To what extent can meaningful supplemental coverage be achieved without exceeding the field strength limit at an adjacent license area boundary of a non-partner licensee? What would be the impact on non-collaborating adjacent area licensees if these satellite signal levels were present? What is the most appropriate metric to use for the satellite service area boundary limit: field strength, power flux density, or some other metric?

147. We note that where the area for which supplemental coverage is sought contains non-partner co-channel licensees, our current rules would require that the signal transmitted by the satellite satisfy the service-specific field strength limit or power flux density at the boundary of the co-channel licensee's adjacent license area.<sup>296</sup> Our rules, however, specifically provide for adjacent market co-channel licensees to reach agreement to establish an alternative limit.<sup>297</sup> We seek comment on whether this is a feasible option to overcome technical challenges presented in the context of newly introduced satellite-based transmissions where non-collaborating licensees are present. Could application of our current rule permitting co-channel neighbors to mutually agree to an alternative field strength limit in a given band be effective in minimizing harmful interference where satellites are deployed to expand terrestrial service? As in the case of potential collaborative agreements to provide SCS to an entire GIA, what rules, if any, should we impose on such agreements with adjacent market non-collaborating licensees to ensure customers do not lose supplemental coverage? We seek comment on these and any other issues related to market area boundary limits for SCS if the proposed framework is expanded to permit SCS operations notwithstanding the presence of non-collaborating co-channel licensees in adjacent markets. Commenters should address the costs and benefits of any alternative technical approaches and provide detailed technical analyses in support.

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<sup>294</sup> Where the satellite is directly over the license area, it will be easier for the transmissions to be contained exclusively within that license area. However, where the satellite is transmitting at a steeper angle with the ground, the transmission is likely to pass through other license areas on its way to reaching its destination.

<sup>295</sup> We note that some, but not all, bands specify the height above ground level at which the relevant emissions measurement takes place. *See, e.g.*, 47 CFR § 27.55(d).

<sup>296</sup> For example, for the 3.45 GHz service, that limit is -76 dBm/m2/MHz, and for the 600 MHz band, it is 40 dBμV/m. *See, e.g.*, 47 CFR § 27.55(e), (a)(2).

<sup>297</sup> *See, e.g., id.* § 27.55.

148. Finally, in the event that we were to expand the scope of the SCS framework, we seek comment on how to assign responsibility for mitigating harmful interference between non-partner, co-channel terrestrial licensees and SCS operators in adjacent markets located within a GIA. Absent specific rules, the Commission generally uses the first in-time principle in such instances; that is, the last station built and implemented generally has to take actions necessary to address any harmful interference that occurs to an earlier implemented station. However, terrestrial mobile service and SCS operators would be able to supplement their systems with additional stations in accordance with their license or authorization; under our flexible-use WRS rules, terrestrial mobile service licensees may build new stations as needed to add additional capacity without notifying the Commission (except where antenna registration is required) and NGSO operators may launch additional satellites in accordance with the provisions of their authorization regarding the maximum number of satellites and permitted orbits. In both cases, it may not be possible to track the relative timing for when any given station was implemented. Could or should the first in-time principle apply here? Should the Commission specify rules to delineate responsibility for interference mitigation? For example, should both services be treated as equals if harmful interference occurs notwithstanding both licensees' operating in compliance with Commission rules? Alternatively, as SCS is contemplated as a method of supplementing a collaborating terrestrial licensee's coverage, should priority be given to a non-collaborating co-channel terrestrial licensee's base station regardless of when they deploy, such that the NGSO operator must always take action to resolve such instances of harmful interference?<sup>298</sup> Under such a regime, could the Commission establish certain technical parameters that would substantially eliminate instances of harmful interference to a non-collaborating co-channel terrestrial station that would make SCS feasible, e.g., by pointing the terrestrial station's antenna above a certain azimuth? Are there particular rules that the Commission should consider for this co-primary situation?

**E. Space-Based Coverage to Consumer Devices in Spectrum Already Allocated for Mobile-Satellite Service Communications**

149. The framework for SCS proposed in this Notice would allow transmissions between satellites and terrestrial devices on spectrum licensed for terrestrial flexible-use wireless networks. However, as noted above, there are other models for providing service to consumer devices via satellite.<sup>299</sup> For example, some established satellite operators are serving mass-market consumer devices, which are designed primarily to operate on terrestrial commercial wireless networks, but that can also function as handheld mobile earth stations using spectrum allocated for mobile-satellite service.<sup>300</sup> Additionally, substantial work has been done in 3GPP to incorporate some satellite bands into the 5G NR specifications, which may provide a path for future interworking of satellite and terrestrial networks.<sup>301</sup>

150. From a regulatory perspective, we believe that such proposals are distinguishable from the SCS framework discussed in this Notice and may not raise the same novel legal and technical complexities as providing supplemental coverage from space using terrestrial spectrum. However, from a consumer perspective, these two scenarios appear identical; in each case, a consumer device is able to

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<sup>298</sup> For example, under current rules, the Allocation Table (47 CFR § 2.106) note 5.487A specifies that for the 12.2-12.7 GHz band, NGSO FSS are allocated co-primary with GSO satellites in the broadcasting-satellite service, but that such NGSO FSS stations "shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information" for stations in either service. It further provides that "[n]on-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated." *Id.*

<sup>299</sup> *See supra* para. 4.

<sup>300</sup> *Id.*

<sup>301</sup> *See supra* para. 5.



receive service via satellite in areas where the terrestrial network does not provide coverage. Accordingly, we seek comment on whether there are any particular considerations or actions needed related to providing supplemental satellite coverage to terrestrial devices besides the SCS framework proposed in this Notice. We seek specific comment on how we can promote access to emergency 911 services and the availability of WEA in models that use currently allocated satellite spectrum and are therefore outside of the proposed SCS framework. How should our 911 requirements apply to collaborations serving consumer devices in these models? More generally, are there other changes to our rules or processes required to help promote the development of such supplemental coverage? Are there regulatory or competitive issues that we should consider related to these models?

#### F. Other Issues

151. *Digital Equity and Inclusion.* Finally, the Commission, as part of its continuing effort to advance digital equity for all,<sup>302</sup> including people of color, persons with disabilities, persons who live in rural or Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality, invites comment on any equity-related considerations<sup>303</sup> and any potential benefits that may be associated with the various approaches and issues discussed herein. Specifically, we seek comment on how the various approaches that the Commission may consider may promote or inhibit advances in diversity, equity, inclusion, and accessibility, as well the scope of the Commission's relevant legal authority.

#### IV. PROCEDURAL MATTERS

152. *Ex Parte Presentations.* The proceeding this Notice initiates shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's ex parte rules. Persons making ex parte presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral ex parte presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the ex parte presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during ex parte meetings are deemed to be written ex parte presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written ex parte presentations and memoranda summarizing oral ex parte presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native

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<sup>302</sup> Section 1 of the Communications Act of 1934 as amended provides that the FCC "regulat[es] interstate and foreign commerce in communication by wire and radio so as to make [such service] available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex." 47 U.S.C. § 151.

<sup>303</sup> The term "equity" is used here consistent with Executive Order 13985 as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. *See* Executive Office of the President, Advancing Racial Equity and Support for Underserved Communities Through the Federal Government, Exec. Order No. 13985, 86 Fed. Reg. 7009 (Jan. 20, 2021).

format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules.

153. *Comment Period and Filing Procedures.* Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://www.fcc.gov/ecfs/>.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing.
- Filings can be sent by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.
- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701, U.S. Postal Service first-class, Express, and Priority mail must be addressed to 45 L Street NE, Washington, DC 20554.
- Effective March 19, 2020, and until further notice, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19. See FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Policy, Public Notice, DA 20-304 (March 19, 2020). (<https://www.fcc.gov/document/fcc-closes-headquarters-open-window-and-changes-hand-delivery-policy> )

154. *People with Disabilities.* To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (TTY).

155. *Regulatory Flexibility Act.* The Regulatory Flexibility Act of 1980, as amended (RFA),<sup>304</sup> requires that a regulatory flexibility analysis be prepared for notice and comment rulemaking proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."<sup>305</sup> Accordingly, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning potential rule and policy changes contained in this *Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix B.

156. *Initial Paperwork Reduction Act Analysis.* This Notice of Proposed Rulemaking may contain potential new or revised information collection requirements. Therefore, we seek comment on potential new or revised information collections subject to the Paperwork Reduction Act of 1995.<sup>306</sup> If the Commission adopts any new or revised information collection requirements, the Commission will publish a notice in the Federal Register inviting the general public and the Office of Management and Budget to comment on the information collection requirements, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of

<sup>304</sup> 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601–612, was amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

<sup>305</sup> 5 U.S.C. § 605(b).

<sup>306</sup> Paperwork Reduction Act of 1995, Pub. L. No. 104-13, 109 Stat. 163 (1995).

2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

157. *Further Information.* For additional information on this proceeding, contact Melissa Conway of the Mobility Division, Wireless Telecommunication Bureau, at [Melissa.Conway@fcc.gov](mailto:Melissa.Conway@fcc.gov) or (202) 418-2887, or Merissa Velez of the Satellite Division, International Bureau, at [Merissa.Velez@fcc.gov](mailto:Merissa.Velez@fcc.gov) or (202) 418-0751.

#### V. ORDERING CLAUSES

158. IT IS ORDERED that, pursuant to sections 1, 4(i), 157, 301, 303, 307, 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 157, 301, 303, 307, 308, 309, and 310, the Notice of Proposed Rulemaking IS ADOPTED.

159. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analyses, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch  
Secretary

**APPENDIX A**

**Proposed Rules**

The Federal Communications Commission proposes to amend 47 CFR parts 2 and 25 as follows:

**PART 2 – FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS**

1. The authority citation for part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

2. Amend § 2.106 as follows:

a. Revise pages 30, 36, 37, and 38.

b. In the list of Non-Federal Government (NG) Footnotes, add footnote NG33A.

The revisions and additions read as follows:

**§ 2.106 Table of Frequency Allocations.**

\* \* \* \* \*

5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.311A 5.312 694-790 MOBILE except aeronautical mobile 5.312A 5.317A BROADCASTING	614-698 BROADCASTING Fixed Mobile 5.293 5.308 5.308A 5.309 5.311A 698-806 MOBILE 5.317A BROADCASTING Fixed	614-698 FIXED MOBILE NG5 NG14 NG33 NG33A NG115 NG149 698-758 FIXED MOBILE BROADCASTING NG33A NG159 758-775 FIXED MOBILE NG34 NG159 775-788 FIXED MOBILE BROADCASTING NG33A NG159 788-805 FIXED MOBILE NG34 NG159 805-806 FIXED MOBILE BROADCASTING NG33A NG159 806-809 LAND MOBILE 809-849 FIXED LAND MOBILE NG33A 849-851 AERONAUTICAL MOBILE 851-854 LAND MOBILE 854-894 FIXED LAND MOBILE	RF Devices (15) Satellite Communications (25) Wireless Communications (27) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H) Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G) Public Safety Land Mobile (90R) Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G) Public Safety Land Mobile (90R) Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G) Public Safety Land Mobile (90R) Satellite Communications (25) Wireless Communications (27) LPTV and TV Translator (74G) Public Safety Land Mobile (90S) Public Mobile (22) Satellite Communications (25) Private Land Mobile (90) Public Mobile (22) Public Safety Land Mobile (90S) Public Mobile (22) Satellite Communications (25) Private Land Mobile (90)
5.149 5.291A 5.294 5.296 5.300 5.304 5.306 5.311A 5.312 694-790 MOBILE except aeronautical mobile 5.312A 5.317A BROADCASTING	614-698 BROADCASTING Fixed Mobile 5.293 5.308 5.308A 5.309 5.311A 698-806 MOBILE 5.317A BROADCASTING Fixed	614-890	
5.300 5.311A 5.312 790-862 FIXED MOBILE except aeronautical mobile 5.316B 5.317A BROADCASTING	5.293 5.309 5.311A 806-890 FIXED MOBILE 5.317A BROADCASTING	US116 US268 NG33A	
5.312 5.319 862-890 FIXED MOBILE except aeronautical mobile 5.317A BROADCASTING 5.322	5.317 5.318		
5.319 5.323	5.149 5.305 5.306 5.307 5.317A 5.320		Page 30

1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile	5.289 5.341 5.384	5.341	5.341 US88	
1710-1930 FIXED MOBILE 5.384A 5.388A 5.388B	1710-1761 5.341 US91 US378 US385	1710-1760 FIXED MOBILE	1710-1760 FIXED MOBILE	5.341 US88	Satellite Communications (25) Wireless Communications (27)
5.149 5.341 5.385 5.386 5.387 5.388	1761-1780 SPACE OPERATION (Earth-to-space) G42 US91	1780-1850 FIXED MOBILE	1780-1850	5.341 US91 US378 US385	
1930-1970 FIXED MOBILE 5.388A 5.388B	1850-2025 SPACE OPERATION (Earth-to-space) G42	1850-2000 FIXED MOBILE	1850-2000 FIXED MOBILE		RF Devices (15) Personal Communications (24) Satellite Communications (25) Wireless Communications (27) Fixed Microwave (101)
5.388 1970-1980 FIXED MOBILE 5.388A 5.388B					
5.388 1980-2010 FIXED MOBILE					
MOBILE-SATELLITE (Earth-to-space) 5.351/A				NG33A	
5.388 5.389A 5.389B 5.389F				2000-2020 FIXED MOBILE	Satellite Communications (25) Wireless Communications (27)
2010-2025 FIXED MOBILE 5.388A 5.388B				MOBILE-SATELLITE (Earth-to-space)	
MOBILE-SATELLITE (Earth-to-space)				2020-2025 FIXED MOBILE	
5.388 2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space)	2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) SPACE RESEARCH (Earth-to-space) (space-to-space) FIXED MOBILE 5.391			2025-2110 FIXED NG118 MOBILE 5.391	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
5.392	5.392 US90 US92 US222 US346 US347			5.392 US90 US92 US222 US346 US347	

Table of Frequency Allocations 2110-2483.5 MHz (UHF) Page 37

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
2110-2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space)			2110-2120	2110-2120 FIXED MOBILE	Public Mobile (22) Satellite Communications (25) Wireless Communications (27) Fixed Microwave (101)
5.388			US252	US252	
2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2160 FIXED MOBILE 5.388A 5.388B	2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2200	2120-2180 FIXED MOBILE	
	Mobile-satellite (space-to-Earth)				
	5.388				
	2160-2170				
	FIXED				
	MOBILE				
	MOBILE-SATELLITE (space-to-Earth)				
5.388	5.388 5.389C 5.389E	5.388			
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A				NG41	Satellite Communications (25) Wireless Communications (27)
5.388 5.389A 5.389F				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	
2200-2290			2200-2290	2200-2290	
SPACE OPERATION (space-to-Earth) (space-to-space) EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)			2200-2290		
FIXED			SPACE OPERATION (space-to-Earth) (space-to-space) US96		
MOBILE 5.391			EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)		
SPACE RESEARCH (space-to-Earth) (space-to-space)			FIXED (line-of-sight only)		
			MOBILE (line-of-sight only including aeronautical telemetry, but excluding flight testing of manned aircraft) 5.391		
			SPACE RESEARCH (space-to-Earth) (space-to-space)		
5.392			5.392 US303		
2290-2300			2290-2300	US96 US303	
FIXED			2290-2300	2290-2300	
MOBILE except aeronautical mobile			FIXED	SPACE RESEARCH (deep space) (space-to-Earth)	
SPACE RESEARCH (deep space) (space-to-Earth)			MOBILE except aeronautical mobile SPACE RESEARCH (deep space) (space-to-Earth)		
2300-2450	2300-2450		2300-2305	2300-2305	
FIXED	FIXED		G122	Amateur	Amateur Radio (97)
MOBILE 5.384A	MOBILE 5.384A		2305-2310	2305-2310	
Amateur	Amateur		FIXED	MOBILE except aeronautical mobile RADIOLOCATION	Satellite Communications (25) Wireless Communications (27) Amateur Radio (97)
Radiolocation	Radiolocation		US97 G122	US97 NG33A	

2310-2320	Fixed Mobile US100 Radiolocation G2	2310-2320 FIXED MOBILE BROADCASTING-SATELLITE RADIOLOCATION	Satellite Communications (25) Wireless Communications (27)
US97 US327		5.396 US97 US100 US327 NG33A	
2320-2345	Fixed Radiolocation G2	2320-2345 BROADCASTING-SATELLITE	Satellite Communications (25)
US327		5.396 US327	
2345-2360	Fixed Mobile US100 Radiolocation G2	2345-2360 FIXED MOBILE US100 BROADCASTING-SATELLITE RADIOLOCATION	Satellite Communications (25) Wireless Communications (27)
US327		5.396 US327 NG33A	
2360-2390	MOBILE US276 Radiolocation G2 G120	2360-2390 MOBILE US276	Aviation (87) Personal Radio (95)
US101		US101	
2390-2395	MOBILE US276	2390-2395 AMATEUR MOBILE US276	Aviation (87) Personal Radio (95) Amateur Radio (97)
US101		US101	
2395-2400		2395-2400 AMATEUR	Personal Radio (95) Amateur Radio (97)
US101 G122		US101	
2400-2417		2400-2417 AMATEUR	RF Devices (15) ISM Equipment (18) Amateur Radio (97)
5.150 G122		5.150 5.282	
2417-2450	Radiolocation G2	2417-2450 Amateur	
5.150		5.150 5.282	
2450-2483.5		2450-2483.5 FIXED MOBILE Radiolocation	RF Devices (15) ISM Equipment (18) TV Auxiliary Broadcasting (74F) Private Land Mobile (90) Fixed Microwave (101)
5.150 5.282 5.395		5.150 5.282 5.393 5.394 5.396	
2450-2483.5	FIXED MOBILE Radiolocation	2450-2483.5 FIXED MOBILE Radiolocation	
5.150		5.150	



\* \* \* \* \*

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

\* \* \* \* \*

NG33A The bands 614-652 MHz and 663-758 MHz, 775 MHz-788 MHz, and 805-806 MHz, 824-849 MHz and 869-894 MHz, 1850-1920 MHz and 1930-2000 MHz, and 2305-2320 MHz and 2345-2360 MHz are allocated to the mobile-satellite service (MSS) on a co-primary basis. MSS operations in these frequency bands are subject to the Commission's rules for Supplemental Coverage from Space set forth in part 25 of this chapter.

\* \* \* \* \*

**PART 25 - SATELLITE COMMUNICATIONS**

3. The authority citation for part 25 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 301, 302, 303, 307, 309, 310, 319, 332, 605, and 721, unless otherwise noted.

4. Amend § 25.103 by adding the following definitions:

**§ 25.103 Definitions.**

\* \* \* \* \*

*Geographically independent area (GIA)*. Any of the following six areas: (1) CONUS; (2) Alaska; (3) Hawaii; (4) American Samoa; (5) Puerto Rico/U.S. Virgin Islands; and (6) Guam/Northern Mariana Islands.

\* \* \* \* \*

*Supplemental Coverage from Space (SCS)*. The provision of coverage to a terrestrial mobile service licensee's subscribers operating in underserved and/or unserved areas within a terrestrial mobile service licensee's license area, comprising a GIA, only through a collaboration between an existing NGSO operator and a terrestrial mobile service licensee involving transmissions between space stations and mobile end-user devices. NGSO operators and terrestrial mobile service licensees seeking to provide SCS must be authorized in compliance with § 25.125.

\* \* \* \* \*

5. Amend § 25.109 by adding a new paragraph (f) to read as follows:

**§ 25.109 Cross-reference.**

\* \* \* \* \*

(f) Space and earth stations providing Supplemental Coverage from Space are subject to technical rules in parts 22, 24, and 27 of this chapter where applicable.

6. Amend § 25.112 by revising paragraph (a)(3) to read as follows:

**§ 25.112 Dismissal and return of applications.**

(a) \* \* \*

(3) The application requests authority to operate a space station in a frequency band that is not allocated internationally for such operations under the Radio Regulations of the International Telecommunication Union, unless the application is filed pursuant to § 25.122, § 25.123, or § 25.125.

\* \* \* \* \*

7. Amend § 25.115 by adding a new paragraph (q) to read as follows:

**§ 25.115 Applications for earth station authorizations.**

\* \* \* \* \*

(q) A blanket license application for an earth station authorization to provide Supplemental Coverage from Space must comply with § 25.125.

8. Amend § 25.117 by adding a new paragraph (i) to read as follows:

**§ 25.117 Modification of station license.**

\* \* \* \* \*

(i) An application for modification of a space station authorization to provide Supplemental Coverage from Space must comply with § 25.125.

9. Add new § 25.125 to read as follows:

**§ 25.125 Applications for supplemental coverage from space (SCS).**

(a) *SCS entry criteria.* This section shall only apply to applicants seeking to provide Supplemental Coverage from Space (SCS). An applicant for SCS space station authorization must be a holder of either an existing part 25 NGSO license or grant of U.S. market access collaborating with a terrestrial mobile service provider that holds all co-channel licenses throughout a Geographically Independent Area (GIA) in a band allocated to Mobile-Satellite Service (MSS) operation through footnote NG33A in the United States Table of Frequency Allocations under § 2.106 of this chapter. Applicants for SCS space stations must comply with the requirements set forth in paragraph (b) of this section. Applicants for SCS earth stations must comply with the requirements set forth in paragraph (c) of this section.

(b) *SCS space station application requirements.* An applicant seeking a space station authorization for the provision of SCS shall submit an application requesting modification of a current part 25 NGSO license or grant of U.S. market access.

(1) The application shall include a certification to the following:

(i) an application is on file with the Commission to lease spectrum allocated for MSS provision of SCS from a terrestrial mobile service provider that holds, either directly or indirectly, all co-channel licenses throughout a GIA;

(ii) the current part 25 space station license or part 25 grant of market access for NGSO satellite operation is sufficient to cover the leased GIA; and

(iii) a blanket license application is on file, pursuant to paragraph (c) of this section, from the satellite operator's terrestrial licensee partner for earth stations, covering all of its subscribers' terrestrial devices that will be transmitting and receiving from the space station in conjunction with the provision of SCS.

(2) The application shall include a comprehensive proposal for each space station in the proposed SCS system on FCC Form 312, Main Form and Schedule S, as described in § 25.114(a) through (d), together with the certification described in paragraph (b)(1) of this section.

(3) Applications that are acceptable for filing will be placed on public notice pursuant to § 25.151 to provide interested parties an opportunity to file pleadings in response to the application pursuant to § 25.154.

(4) The Commission will review the application and all the pleadings filed in response to the application, and will grant applications that meet the standards of this section, § 25.156(a), and are otherwise in accordance with applicable Commission rules.

(5) Applications to modify a part 25 authorization to provide SCS will not be subject to the processing round procedures in §§ 25.137 and 25.157.

(c) *SCS earth station application requirements.* A terrestrial licensee collaborating with an NGSO satellite operator to provide SCS shall submit an application for a blanket earth station license for all of its subscribers' terrestrial end-user devices that will communicate with the NGSO operator's space stations.

(1) The terrestrial licensee must file for such earth station authorization using FCC Form 312, Main Form and Schedule B, as described in § 25.115(a), specifying the number of units to be covered by the blanket license.

(2) Applications that are acceptable for filing will be placed on public notice pursuant to § 25.151 to provide interested parties an opportunity to file pleadings in response to the application pursuant to § 25.154.

(3) The Commission will review the application and all the pleadings filed in response to the application, and will grant applications that meet the standards of this section, § 25.156(a), and are otherwise in accordance with applicable Commission rules.

(4) Once the terrestrial licensee receives a part 25 blanket license for its subscribers' terrestrial devices, it may avail itself of the minor modification procedures for blanket earth station licenses pursuant to § 25.118 to add additional terrestrial devices without prior Commission approval.

(d) *SCS joint licensing requirement.* Authorization to provide SCS requires grant of three applications: part 25 modification application or request for modification of a grant of market access; part 1 lease application; and part 25 blanket earth station license application.

(e) *Equipment authorization for SCS earth stations.*

(1) Each SCS earth station used for the provision of SCS under this section shall meet the equipment authorization requirements under § 25.129 and all equipment authorization requirements for all intended uses of the device as specified in parts 22, 24, and 27 of this chapter (e.g., §§ 22.377, 24.51, 27.51).

(2) Terrestrial devices with existing equipment authorizations under parts 22, 24, or 27 of this chapter as of [[EFFECTIVE DATE OF FINAL RULE]] are authorized by rule for SCS use under this section, consistent with their existing equipment authorizations.

10. Amend § 25.129 by adding a new paragraph (e) to read as follows:

**§ 25.129 Equipment authorization for portable earth-station transceivers.**

\* \* \* \* \*

(e) Earth station transceivers used for the provision of SCS shall comply with § 25.125.

11. Amend § 25.137 by revising paragraph (f) to read as follows:

**§ 25.137 Requests for U.S. market access through non-U.S.-licensed space stations.**

\* \* \* \* \*

(f) A non-U.S.-licensed space station operator that has been granted access to the United States market pursuant to a declaratory ruling may modify its U.S. operations under the procedures set forth in §§ 25.117(d), (h), and (i) and 25.118(e).

12. Amend § 25.202 by adding a new paragraph (k) to read as follows:

**§ 25.202 Frequencies, frequency tolerance, and emission limits.**

\* \* \* \* \*

(k) Space station downlinks operating as SCS under the provisions of NG33A of the U.S. Table of Allocations and § 25.125 are subject to the following rules.

(1) *Out of band emission limits.* Space station downlink emissions on spectrum allocated for mobile-satellite service and used in providing SCS shall meet the out-of-band emission limits applicable to the terrestrial base stations of its terrestrial partner, as set forth in parts 22, 24, or 27 of this chapter (e.g., §§ 22.917, 24.238, 27.53), respectively.

(2) Reserved.

13. Amend § 25.204 by adding a new paragraph (g) to read as follows:

**§ 25.204 Power limits for earth stations.**

\* \* \* \* \*

(g) Earth stations operating in conjunction with the provision of SCS pursuant to § 25.125 shall comply with the power requirements for the respective band of operation of the terrestrial partner for terrestrial transceivers in parts 22, 24, or 27 of this chapter (e.g., §§ 22.913, 24.232, 27.50).

14. Amend § 25.208 by adding a new paragraph (w) to read as follows:

**§ 25.208 Power flux-density limits.**

\* \* \* \* \*

(w) SCS operations in bands authorized by NG33A in the Table of Frequency Allocations and § 25.125 must meet the relevant boundary signal level limits and coordination requirements for the relevant terrestrial band of operation, as specified by treaty and in parts 22, 24, and 27 of this chapter (e.g., §§ 22.169, 22.983(c), 24.236, 27.55, 27.57), at applicable international borders. Conversion from field strength to PFD shall be done using accepted engineering techniques.

## APPENDIX B

## Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),<sup>1</sup> the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this *Notice of Proposed Rulemaking (Notice)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadline for comments on the *Notice*. The Commission will send a copy of the *Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).<sup>2</sup> In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register.<sup>3</sup>

**A. Need for, and Objectives of, the Proposed Rules**

2. In the *Notice*, the Commission proposes a new regulatory framework for Supplemental Coverage from Space (SCS) in which satellite operators collaborating with terrestrial mobile service providers would be able to obtain Commission authorization to operate space stations on currently licensed, flexible-use spectrum allocated to terrestrial services, thus expanding coverage to the terrestrial licensee's subscribers, especially in remote, unserved, and underserved areas. This framework could enable innovation and investment in nascent satellite and terrestrial interoperable technologies and cross-industry stakeholder partnerships to flourish in the United States. The goals of the proposed framework include facilitating ubiquitous wireless coverage across the nation; expanding the availability of emergency communications to consumers and the geographic range of first responders to provide emergency services; and promoting competition in the provision of wireless services to consumers. The proposal also enables more intensive spectrum use and would be consistent with the Commission's goal to allocate increasingly scarce spectrum resources in the most efficient and effective manner possible. The Commission anticipates that the proposed SCS approach will incentivize creative partnerships between terrestrial network and space station operators and will provide additional tools to close wireless coverage gaps while at the same time retaining high service quality among 4G and 5G terrestrial networks, protect spectrum usage rights, and avoid harmful interference.

3. The Commission's rules require the use of frequencies and frequency bands to be in accordance with the United States Table of Frequency Allocations (U.S. Table). To permit SCS to the subscribers of the relevant terrestrial networks using certain terrestrial bands, the Commission proposes to modify the U.S. Table to authorize mobile-satellite service (space-to-Earth and Earth-to-space) operations in certain terrestrial bands that have no primary, federal or non-federal satellite allocations. The Commission proposes to add a non-federal footnote to the U.S. Table authorizing mobile-satellite service operations on a co-primary basis with existing allocations in a number of terrestrial flexible-use bands. Specifically, given the complexity of the proposed approach (particularly in terms of technical considerations), the Commission limits its initial proposal to spectrum and locations where (1) there is only a single terrestrial entity that holds, either directly or indirectly, all co-channel licenses for the relevant frequencies in a given geographically independent area (GIA); and (2) there are no primary, non-flexible use legacy incumbent operations (whether federal or non-federal) in the band. The flexible-use terrestrial bands for which the Commission proposes at this time to add a non-federal mobile-satellite service footnote allocation are:

- 600 MHz: 614-652 MHz and 663-698 MHz;

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<sup>1</sup> See 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601–612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

<sup>2</sup> See 5 U.S.C. § 603(a).

<sup>3</sup> See *id.*

- 700 MHz: 698-758 MHz, 775 MHz-788 MHz, and 805-806 MHz;
- 800 MHz: 824-849 MHz and 869-894 MHz;
- Broadband PCS: 1850-1915 MHz and 1930-1995 MHz;
- AWS-H Block: 1915-1920 MHz and 1995-2000 MHz; and
- WCS: 2305-2320 MHz and 2345-2360 MHz

The *Notice* discusses features of each band in detail, including the status of incumbents and relevant service rules that may impact the band's potential use under the proposed framework. The allocation is limited to transmissions between a space station and an end user device (e.g., smartphone or IoT device) of a subscriber of a terrestrial service that is designed to be used in the relevant terrestrial flexible-use band.

4. The Commission strives to realize the public interest benefits of SCS as rapidly as possible, while minimizing the risk of harmful interference. To avoid technical complexities that could arise where SCS is introduced in areas where multiple co-channel licensees are present on a particular spectrum block, the Commission proposes to initially authorize SCS only in cases where a single terrestrial licensee holds all co-channel licenses on the relevant band in one of the following GIAs: (1) the contiguous United States (CONUS); (2) Alaska; (3) Hawaii; (4) American Samoa; (5) Puerto Rico/U.S. Virgin Islands; and (6) Guam/Northern Mariana Islands. In addition, the Commission proposes initially to limit the SCS framework to non-geostationary satellite orbit (NGSO) satellite operators with an existing part 25 license or an existing part 25 grant of market access (for non-U.S. licensed satellite operators) (together, "authorization"), because such operators are best positioned for rapid implementation of supplemental coverage from space. To apply for authorization to provide SCS, a satellite operator with an existing part 25 authorization for NGSO operation must be able to certify that it has: (1) an application on file with the Commission to lease the exclusive-use spectrum, allocated for mobile-satellite service (MSS) provision of SCS, of a terrestrial licensee that holds all co-channel licenses throughout a GIA; (2) a current part 25 space station license or part 25 grant of market access for NGSO satellite operation sufficient to cover the GIA specified in the lease; and (3) proof of an application on file from the satellite operator's terrestrial partner for a part 25 blanket earth station license covering all of its subscribers' terrestrial devices that will be transmitting and receiving from the space station in conjunction with the provision of SCS. In addition to the proposed approach to authorizing space station operations, the *Notice* proposes to authorize earth station operations by modifying the Commission's part 25 rules to require a terrestrial licensee that has partnered with a satellite operator to seek a blanket earth station license for all of its subscribers' terrestrial devices that will operate with space stations, and are otherwise authorized under the terrestrial license.

5. In the *Notice*, the Commission proposes a novel framework to facilitate SCS, a service offering that leverages currently licensed terrestrial, flexible-use spectrum. The Commission addresses existing service rule obligations for satellite operators and terrestrial wireless providers, by proposing to apply certain relevant rules, or seeking comment on the applicability of other rules in the context of the proposed part 25 licensing framework to authorize SCS. Additionally, the Commission notes that SCS operators would be required to protect adjacent band operations to the same extent required today under current rules for terrestrial use, and seeks to facilitate SCS through operations that are fully capable of complying with current technical rules and restrictions intended to prevent harmful interference. The Commission does not seek to modify the current, long-standing and carefully considered protection requirements, but instead seeks comment on this approach in the *Notice*, and on whether there are alternatives to ensure that any SCS offerings in these previously terrestrial-only allocated bands preserve the spectrum landscape to prevent harmful interference.

#### **B. Legal Basis**

6. The proposed action is authorized pursuant to sections 1, 4(i), 157, 301, 303, 307, 308, 309, and 310 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 301, 303, 307, 308, 309, and 310.

### C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply

7. The RFA directs agencies to provide a description of, and where feasible, an estimate of, the number of small entities that may be affected by the proposed rules, if adopted.<sup>4</sup> The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”<sup>5</sup> In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.<sup>6</sup> A small business concern is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.<sup>7</sup>

8. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three broad groups of small entities that could be directly affected herein.<sup>8</sup> First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA’s Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.<sup>9</sup> These types of small businesses represent 99.9% of all businesses in the United States which translates to 32.5 million businesses.<sup>10</sup>

9. Next, the type of small entity described as a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”<sup>11</sup> The Internal Revenue Service (IRS) uses a revenue benchmark of \$50,000 or less to delineate its annual electronic filing requirements for small exempt organizations.<sup>12</sup> Nationwide, for tax year 2020, there were approximately 447,689 small exempt organizations in the U.S. reporting revenues of \$50,000 or less according to the registration and tax data for exempt organizations available from the IRS.<sup>13</sup>

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<sup>4</sup> 5 U.S.C. § 603(b)(3).

<sup>5</sup> 5 U.S.C. § 601(6).

<sup>6</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

<sup>7</sup> 15 U.S.C. § 632.

<sup>8</sup> See 5 U.S.C. § 601(3)-(6).

<sup>9</sup> See SBA, Office of Advocacy, Frequently Asked Questions, “What is a small business?,” <https://cdn.advocacy.sba.gov/wp-content/uploads/2021/11/03093005/Small-Business-FAQ-2021.pdf>. (Nov 2021).

<sup>10</sup> *Id.*

<sup>11</sup> 5 U.S.C. § 601(4).

<sup>12</sup> The IRS benchmark is similar to the population of less than 50,000 benchmark in 5 U.S.C § 601(5) that is used to define a small governmental jurisdiction. Therefore, the IRS benchmark has been used to estimate the number small organizations in this small entity description. See Annual Electronic Filing Requirement for Small Exempt Organizations — Form 990-N (e-Postcard), “Who must file,” <https://www.irs.gov/charities-non-profits/annual-electronic-filing-requirement-for-small-exempt-organizations-form-990-n-e-postcard>. We note that the IRS data does not provide information on whether a small exempt organization is independently owned and operated or dominant in its field.

<sup>13</sup> See Exempt Organizations Business Master File Extract (EO BMF), “CSV Files by Region,” <https://www.irs.gov/charities-non-profits/exempt-organizations-business-master-file-extract-eo-bmf>. The IRS Exempt Organization Business Master File (EO BMF) Extract provides information on all registered tax-exempt/non-profit organizations. The data utilized for purposes of this description was extracted from the IRS EO BMF data for businesses for the tax year 2020 with revenue less than or equal to \$50,000 for Region 1-Northeast

(continued....)

10. Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”<sup>14</sup> U.S. Census Bureau data from the 2017 Census of Governments<sup>15</sup> indicate that there were 90,075 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.<sup>16</sup> Of this number there were 36,931 general purpose governments (county<sup>17</sup>, municipal and town or township<sup>18</sup>) with populations of less than 50,000 and 12,040 special purpose governments - independent school districts<sup>19</sup> with enrollment populations of less than 50,000.<sup>20</sup> Accordingly, based on the 2017 U.S. Census of Governments data, we estimate that at least 48,971 entities fall into the category of “small governmental jurisdictions.”<sup>21</sup>

11. *Satellite Telecommunications.* This industry comprises firms “primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.”<sup>22</sup> Satellite telecommunications service providers include satellite and earth station operators. The SBA small business size standard for this industry classifies a business

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Area (58,577), Region 2-Mid-Atlantic and Great Lakes Areas (175,272), and Region 3-Gulf Coast and Pacific Coast Areas (213,840) that includes the continental U.S., Alaska, and Hawaii. This data does not include information for Puerto Rico.

<sup>14</sup> 5 U.S.C. § 601(5).

<sup>15</sup> See 13 U.S.C. § 161. The Census of Government is conducted every five (5) years compiling data for years ending with “2” and “7”. See also *See also* Census of Governments, <https://www.census.gov/programs-surveys/cog/about.html>.

<sup>16</sup> See U.S. Census Bureau, 2017 Census of Governments – Organization, Table 2. Local Governments by Type and State: 2017 [CG1700ORG02]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. Local governmental jurisdictions are made up of general purpose governments (county, municipal and town or township) and special purpose governments (special districts and independent school districts). See also tbl.2. CG1700ORG02 Table Notes\_Local Governments by Type and State\_2017.

<sup>17</sup> See *id* at tbl.5, County Governments by Population-Size Group and State: 2017 [CG1700ORG05]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 2,105 county governments with populations less than 50,000. This category does not include subcounty (municipal and township) governments.

<sup>18</sup> See *id* at tbl.6, Subcounty General-Purpose Governments by Population-Size Group and State: 2017 [CG1700ORG06]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 18,729 municipal and 16,097 town and township governments with populations less than 50,000.

<sup>19</sup> See *id* at tbl.10, Elementary and Secondary School Systems by Enrollment-Size Group and State: 2017 [CG1700ORG10]. <https://www.census.gov/data/tables/2017/econ/gus/2017-governments.html>. There were 12,040 independent school districts with enrollment populations less than 50,000. See also tbl.4. Special-Purpose Local Governments by State Census Years 1942 to 2017 [CG1700ORG04], CG1700ORG04 Table Notes\_Special Purpose Local Governments by State\_Census Years 1942 to 2017.

<sup>20</sup> While the special purpose governments category also includes local special district governments, the 2017 Census of Governments data does not provide data aggregated based on population size for the special purpose governments category. Therefore, only data from independent school districts is included in the special purpose governments category.

<sup>21</sup> This total is derived from the sum of the number of general purpose governments (county, municipal and town or township) with populations of less than 50,000 (36,931) and the number of special purpose governments - independent school districts with enrollment populations of less than 50,000 (12,040), from the 2017 Census of Governments - Organizations tbl.5, 6, & 10.

<sup>22</sup> See U.S. Census Bureau, 2017 NAICS Definition, “517410 Satellite Telecommunications,” <https://www.census.gov/naics/?input=517410&year=2017&details=517410>.



with \$38.5 million or less in annual receipts as small.<sup>23</sup> U.S. Census Bureau data for 2017 show that 275 firms in this industry operated for the entire year.<sup>24</sup> Of this number, 242 firms had revenue of less than \$25 million.<sup>25</sup> Additionally, based on Commission data in the 2021 Universal Service Monitoring Report, as of December 31, 2020, there were 71 providers that reported they were engaged in the provision of satellite telecommunications services.<sup>26</sup> Of these providers, the Commission estimates that approximately 48 providers have 1,500 or fewer employees.<sup>27</sup> Consequently, using the SBA's small business size standard, a little more than half of these providers can be considered small entities.

12. *Wireless Telecommunications Carriers (except Satellite)*. This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves.<sup>28</sup> Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular services, paging services, wireless internet access, and wireless video services.<sup>29</sup> The SBA size standard for this industry classifies a business as small if it has 1,500 or fewer employees.<sup>30</sup> U.S. Census Bureau data for 2017 show that there were 2,893 firms in this industry that operated for the entire year.<sup>31</sup> Of that number, 2,837 firms employed fewer than 250 employees.<sup>32</sup> Additionally, based on Commission data in the 2021 Universal Service Monitoring Report, as of December 31, 2020, there were 797 providers that reported they were engaged in the provision of wireless services.<sup>33</sup> Of these providers, the Commission estimates that 715 providers have 1,500 or fewer employees.<sup>34</sup> Consequently, using the SBA's small business size standard, most of these providers can be considered small entities.

13. *All Other Telecommunications*. This industry is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications

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<sup>23</sup> See 13 CFR § 121.201, NAICS Code 517410.

<sup>24</sup> See U.S. Census Bureau, *2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017*, Table ID: EC1700SIZEREVFIRM, NAICS Code 517410, <https://data.census.gov/cedsci/table?y=2017&n=517410&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false>.

<sup>25</sup> *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, see [https://www.census.gov/glossary/#term\\_ReceiptsRevenueServices](https://www.census.gov/glossary/#term_ReceiptsRevenueServices).

<sup>26</sup> Federal-State Joint Board on Universal Service, Universal Service Monitoring Report at 26, Table 1.12 (2021), <https://docs.fcc.gov/public/attachments/DOC-379181A1.pdf>.

<sup>27</sup> *Id.*

<sup>28</sup> See U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers (except Satellite)"*, <https://www.census.gov/naics/?input=517312&year=2017&details=517312>.

<sup>29</sup> *Id.*

<sup>30</sup> See 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

<sup>31</sup> See U.S. Census Bureau, *2017 Economic Census of the United States, Employment Size of Firms for the U.S.: 2017*, Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, <https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false>.

<sup>32</sup> *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

<sup>33</sup> Federal-State Joint Board on Universal Service, Universal Service Monitoring Report at 26, Table 1.12 (2021), <https://docs.fcc.gov/public/attachments/DOC-379181A1.pdf>.

<sup>34</sup> *Id.*

telemetry, and radar station operation.<sup>35</sup> This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems.<sup>36</sup> Providers of Internet services (e.g. dial-up ISPs) or voice over Internet protocol (VoIP) services, via client-supplied telecommunications connections are also included in this industry.<sup>37</sup> The SBA small business size standard for this industry classifies firms with annual receipts of \$35 million or less as small.<sup>38</sup> U.S. Census Bureau data for 2017 show that there were 1,079 firms in this industry that operated for the entire year.<sup>39</sup> Of those firms, 1,039 had revenue of less than \$25 million.<sup>40</sup> Based on this data, the Commission estimates that the majority of “All Other Telecommunications” firms can be considered small.

#### **D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities**

14. To effectuate SCS in certain flexible-use bands previously allocated solely for terrestrial use, the Commission proposes to authorize satellite-to-terrestrial (uplink and downlink) operations in these bands by allowing an NGSO satellite operator with an existing part 25 authorization to apply to modify such authorization where that entity meets certain prerequisites, or “entry criteria.” The proposed framework and requirements upon which the Commission seeks comment, if adopted, may impose new and/or additional reporting, recordkeeping and other compliance requirements on small entities as well as other licensees to allow those licensees seeking to provide SCS.

15. Specifically, the Commission proposes that a satellite operator authorized for NGSO satellite operation may apply to modify its part 25 authorization only if the satellite operator has: (1) an application on file with the Commission to lease the exclusive-use spectrum, allocated for MSS provision of SCS, of a terrestrial licensee that holds all co-channel licenses, directly or indirectly, throughout a GIA; (2) a current part 25 space station license or part 25 grant of market access for NGSO satellite operation sufficient to cover the leased GIA; and (3) proof of an application on file from the satellite operator’s terrestrial partner for a part 25 blanket earth station license covering all of its subscribers’ terrestrial devices that will be transmitting and receiving from the space station in conjunction with the provision of SCS.

16. Under the Commission’s proposed framework, meeting the proposed entry criteria would allow an entity to apply to modify its existing satellite authorization. However, all related applications including those seeking modification, lease applications, and blanket earth station applications—must first be granted to provide supplemental coverage from space. Thus, the requirements proposed in the *Notice* are in addition to the existing underlying reporting, recordkeeping, and compliance requirements. The *Notice* seeks comment on the Commission’s proposed approach, including the costs, benefits, and

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<sup>35</sup> See U.S. Census Bureau, *2017 NAICS Definition*, “517919 All Other Telecommunications,” <https://www.census.gov/naics/?input=517919&year=2017&details=517919>.

<sup>36</sup> *Id.*

<sup>37</sup> *Id.*

<sup>38</sup> See 13 CFR § 121.201, NAICS Code 517919 (as of 10/1/22, NAICS Code 517810).

<sup>39</sup> See U.S. Census Bureau, *2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017*, Table ID: EC1700SIZEREVFIRM, NAICS Code 517919, <https://data.census.gov/cedsci/table?y=2017&n=517919&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false>.

<sup>40</sup> *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, see [https://www.census.gov/glossary/#term\\_ReceiptsRevenueServices](https://www.census.gov/glossary/#term_ReceiptsRevenueServices).

burdens associated with alternative methods of authorizing SCS, and any incremental burdens associated with adding SCS, such as additional recordkeeping that may be required.

17. At this time, the Commission is not in a position to determine whether the proposed rules and associated requirements raised in the *Notice* would require small entities to hire attorneys, engineers, consultants, or other professionals, and cannot quantify the cost of compliance with the potential rule changes and compliance obligations raised herein. The Commission invites comment on the costs and burdens of the proposals in the *Notice* and expects the information received in comments including, where requested, cost and benefit analyses, to help the Commission identify and evaluate relevant compliance matters for small entities, including compliance costs and other burdens that may result if the proposals and associated requirements discussed in the *Notice* are adopted.

**E. Steps Taken to Minimize the Significant Economic Impact on Small Entities, and Significant Alternatives Considered**

18. The RFA requires an agency to describe any significant, specifically small business, alternatives for small businesses that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities.”<sup>41</sup>

19. The Commission has a longstanding commitment to ensuring that the country’s scarce and valuable spectrum resource is put to its highest and best use. Consistent with this commitment, in the *Notice*, the Commission has proposed a novel framework for SCS that would allow, through a collaboration between a terrestrial mobile service provider and satellite operator, transmissions directly from satellites to terrestrial devices on spectrum that is currently allocated and licensed exclusively on a terrestrial basis. In the discussion of the proposals and matters upon which the *Notice* seeks comment, the Commission raises alternatives and seeks input such as costs and benefits analyses from small and other entities. By requesting such information, the Commission has given small entities the opportunity to broaden the scope of the Commission’s understanding of impacts which may not be readily apparent, and offer alternatives not already considered that could minimize the economic impact on small entities.

20. Although the Commission limits its initial SCS framework proposal to NGSO operators with an existing part 25 license or an existing part 25 grant of market access (for non-U.S. licensed satellite operators) because these operators are in the best position to rapidly implement supplemental coverage from space, the Commission considered that there may be other alternatives, and in the *Notice* seeks comment on other approaches that might permit new entrants to participate in this framework. Current part 25 authorization for NGSO systems typically involves a processing round procedure whereby applicants for licenses or petitioners for U.S. market access are considered in groups based on frequencies requested and filing date.<sup>42</sup> The issuance of a modified part 25 satellite authorization, coupled with a leasing requirement included in the proposed entry criteria, would appropriately encompass the necessary arrangement for the provision of supplemental coverage from space. Thus, the initial proposal would not allow a satellite operator to be granted an independent part 25 co-channel authorization to use terrestrial spectrum in a GIA without an arrangement with the terrestrial license holder.

21. In the *Notice*, the Commission considered and asked whether a satellite operator with an existing part 25 space authorization should be permitted to apply for a conditional license to modify its authorization (in order to provide terrestrial coverage) without first having identified a terrestrial license partner. The Commission further considered and asked whether such an approach would provide

<sup>41</sup> 5 U.S.C. § 603(c)(1)-(4).

<sup>42</sup> See 47 CFR §§ 25.137(c), 25.157.

additional flexibility to facilitate the participation of small businesses. Using the measured approach the Commission described above will allow the Commission to fully develop a robust record to consider policies and rules that may ultimately permit expansion to new or other types of satellite entrants collaborating with terrestrial licensees such as small entities authorized on additional spectrum blocks that do not meet the proposed SCS framework.

22. As part of the SCS framework, the Commission proposes that a terrestrial licensee seeking to collaborate with a satellite operator to offer SCS must apply for and obtain a blanket earth station license for all of its subscribers' terrestrial devices that will be transmitting to space stations for SCS operations, and the Commission seeks comment on this approach and any other approaches that will be consistent with statutory and international obligations. The Commission also seeks comment on how it can streamline earth station licensing processes and forms for SCS blanket earth station applications to eliminate any undue burden. For example, the *Notice* asks to what extent approval of devices in the equipment certification process would render information ordinarily required in a blanket earth station application unnecessary. To streamline the licensing process, the *Notice* seeks comment on what information currently collected in Schedule B might be eliminated and perhaps be replaced by a certification(s). If a certification approach is adopted, the *Notice* seeks comment on what certifications would be necessary. For example, instead of listing the devices that would be covered, the *Notice* asks whether it would be sufficient to require a certification stating that: (1) the earth station applicant meets all SCS requirements; (2) the blanket earth station license will cover all of the current and future subscribers' devices activated in the relevant terrestrial network; and (3) the devices covered by the blanket earth station license have already received equipment authorizations under Commission rules.

23. The *Notice* also seeks comment on eligibility for the Enhanced Competition Incentive Program (ECIP), which the Commission established in July 2022<sup>43</sup> to facilitate new opportunities for small carriers and tribal nations to increase access to spectrum, while incorporating provisions to ensure against program waste, fraud and abuse.<sup>44</sup> Given that the proposed framework is primarily intended to facilitate provision of SCS to existing consumer handsets, and ECIP was adopted with requirements tailored specifically towards provision of service through terrestrial base stations, the Commission seeks comment on whether to make SCS participants, necessarily engaged in leasing arrangements, eligible for ECIP benefits which could reduce the economic impacts for small carriers and tribal nations.

24. The ECIP rules were designed to facilitate broader access to wireless spectrum under two prongs, one focused on transactions with small carriers or tribal nations and one focused on transactions resulting in construction in rural areas. The program benefits include lengthened license terms and extended timeframes to meet program requirements, but the program also incorporates recordkeeping elements designed to prevent waste, fraud, and abuse. The Commission considered and the *Notice* seeks comment on how to integrate these safeguards and the ECIP program's goals with the expansion of SCS. Specifically, the *Notice* requests comment on how the Commission would apply ECIP rules requiring specific lessee action under the rural transactions-focused prong, as stated above, to a part 25 satellite-licensed lessee, with particular focus on the requirement that a lessee provide service for the entire Qualifying Geography for three continuous years and that service must commence no later than two years after entering the lease. The Commission also considered and seeks comment on how to address any potential conflict between these ECIP obligations and part 25 milestones applicable to a satellite licensee, and asks whether parties can meet ECIP requirements in an SCS context, or whether the tailored conditions of ECIP participation would reduce the flexibility of potential terrestrial-satellite collaborators

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<sup>43</sup> We note that, to date, the rules substantially implementing the ECIP program have not become effective, as the Commission has not received the required OMB approval under the Paperwork Reduction Act.

<sup>44</sup> *Partitioning, Disaggregation, & Leasing of Spectrum, Report and Order and Second FNPRM*, FCC 22-53 (2022), paras. 1-2.

and thus operate as a disincentive for SCS providers to participate in the ECIP program regardless of whether it is permitted.

25. Further, the Commission asks whether there are any additional competitive or public interest concerns that it should consider that would weigh in favor of placing limits on the proposed collaboration. The *Notice* seeks comment on the extent to which authorizing SCS as proposed would impact current commercial agreements (e.g., secondary markets and/or roaming arrangements), particularly those involving smaller carriers, or impact stakeholders' prospective participation in the Commission's recently adopted ECIP program. The *Notice* also seeks comment on whether and to what extent the proposed SCS framework, if adopted, could impact marketplace incentives to negotiate such future commercial agreements.

26. Allowing smaller entities to collaborate to provide SCS service could facilitate increased small business participation. The Commission considered extending the provision of SCS to geographically independent areas where collaborating terrestrial licensees hold all co-channel licenses and seek to provide SCS, and seeks comment on this alternative in the *Notice*. Specifically, the Commission asks whether it should extend the proposal to include scenarios in which there are multiple unaffiliated flexible-use licensees in a given GIA, but all licensees in that area agree to jointly provide supplemental coverage from space to their customers in cooperation with a satellite provider. The *Notice* also seeks comment on the likelihood, in this scenario, of stakeholders reaching agreements where all relevant terrestrial network operators would be coordinating to enable this innovative new capability without causing harmful interference, the market arrangements that might be required, and the types of changes to the proposed SCS framework that such a change would entail.

27. In addition, the Commission considered scenarios where the geographic area subject to potential SCS contains non-partner, co-channel licensees in adjacent markets located within a GIA, which could impact small businesses. For example, a terrestrial wireless licensee that does not hold all co-channel licenses in a given GIA, for example CONUS, may nonetheless seek to partner with a satellite licensee to offer supplemental coverage in a part of CONUS. Such scenarios can present complex legal and technical challenges, and the *Notice* therefore seeks comment on how these challenges, particularly the potential for harmful interference to adjacent market, co-channel licensees that are not seeking to collaborate with the joint providers of supplemental satellite coverage, and that could include small businesses, can be overcome. Consequently, the *Notice* seeks comment on the technical and/or financial viability of SCS expansion in scenarios without 100 percent CONUS coverage. Further, the *Notice* seeks comment on whether it is possible to enable SCS in bands that have non-flexible use legacy incumbent operations entitled to protection under Commission rules, which could consist of small business incumbent licensees. The Commission recognizes that each such band will require individual analysis of the technical characteristics of the spectrum to be deployed, as well as the nature and location of the relevant incumbent operations. The Commission therefore considered and seeks comment on whether there are common features among different bands that would allow provision of SCS with similar rules. For example, the *Notice* seeks comment on whether there are bands for which non-flexible use incumbent operations are sufficiently localized such that protection zones would provide sufficient protection and, if so, what are those zones and protection requirements.

28. The Commission expects to more fully consider the economic impact and alternatives for small entities following the review of comments and costs and benefits analyses filed in response to the *Notice*. The Commission's evaluation of this information will shape the final alternatives it considers, the final conclusions it reaches, and any final actions it ultimately takes in this proceeding to minimize any significant economic impact that may occur on small entities.

**F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules**

29. None.

**STATEMENT OF  
CHAIRWOMAN JESSICA ROSENWORCEL**

Re: *In the Matter of Single Network Future: Supplemental Coverage from Space, Space Innovation, GN Docket No. 23-65, IB Docket No. 22-271, Notice of Proposed Rulemaking (March 16, 2023)*

We are fast heading to a world where next-generation wireless networks will connect everyone and everything around us. They will open up possibilities for communications that we cannot even fully imagine today. But we will not be successful in our effort to make this always-on connectivity available to everyone, everywhere if we limit ourselves to using only one technology. We are going to need it all—fiber networks, licensed terrestrial wireless systems, next-generation unlicensed technology, and satellite broadband. But if we do this right, these networks will seamlessly interact in a way that is invisible to the user. We won't need to think about what network, where, and what services are available. Connections will just work everywhere, all the time.

That vision is what we call the Single Network Future—and the opportunities are big. But the path to this future is going to require many steps—and we take an important one today.

Instead of talking just in generalities about what lies ahead, let me provide a clear example of what it means to have a Single Network Future with coverage everywhere.

Consider Angeles National Forest in California. This is a wilderness area nestled between the San Gabriel Mountains and the Sierra Pelona Mountains. That puts it just north of Los Angeles. The area is welcome retreat from the hustle and bustle of the city.

The landscapes here are pretty amazing, but the topography makes it difficult to get a consistent wireless signal. Back in December, a couple was traveling in this area and their car went off the road. In fact, it fell 300 feet from the Angeles Forest Highway. This is a really remote area. There was no cell service. No one would have known to look for them. Plus, this is the kind of environment that—beautiful as it is—gets really treacherous at night, when the temperatures drop to dangerous levels.

Now this story could have happened in lots of places. And it could have ended for this couple right there, but it did not. They survived, with some grit, some luck, and some new technology. They had a phone that had a new feature: the ability to connect directly to satellite signals delivered from space. A help message reached first responders with their precise location. Within 30 minutes, a rescue helicopter was airlifting the couple to a hospital.

What is so striking about this story is that it demonstrates how bringing satellite and terrestrial wireless capabilities together can accomplish what neither network can do on its own. We are starting to see direct satellite-to-smartphone communication move from sci-fi fantasy to real-world prospect. Because small startups, big operators, handset providers, and even software companies have all announced new plans to connect satellites directly to our devices so that we stay always connected—especially when the unthinkable occurs.

This is really neat. But it is important to remember for now these early space communications projects may not provide high-speed broadband from the stratosphere to our phones. But to start, they could deliver low-bandwidth connectivity suitable for emergency calls and texts in remote settings where terrestrial networks do not reach.

For this innovation to have a chance to deliver at scale—and for us to move toward a full Single Network Future with more providers, in more spectrum bands, and a global footprint—regulators will need to develop frameworks that support its development. After all, not everyone will have all the pieces to make this work. Some business and technology models will require new and different regulatory approvals before they can get off the ground. There are challenges with access to airwaves, frequencies

that are not all globally aligned, possibilities for interference that must be managed, and standards work that could help grow these capabilities. But what is clear is that with the growing interest in the possibilities of convergence of satellite and terrestrial services, an ad-hoc, case-by-case approach to these new ventures is not enough.

Last month I spoke about this vision of the Single Network Future at Mobile World Congress in Barcelona. There was a lot of interest from regulators and companies around the globe. Because the framework we are proposing is the first of its kind anywhere in the world. We are going to lead.

This is what that leadership looks like—today we are proposing a way forward for Supplemental Coverage from Space. This would allow a satellite operator to partner with a terrestrial mobile licensee to get access to their terrestrial spectrum through a lease arrangement and modification to the satellite operator's license. Then the satellite system can provide service directly to the subscribers of the wireless carrier in areas where the carrier lacks coverage. While our starting proposal focuses on frequency bands where the wireless licensee has nationwide service, we do not want to limit our efforts. So we also seek comment on how this could work if the mobile carrier has less than a nationwide footprint and still protects spectrum rights and prevents harmful interference.

Our approach is designed to make it easier for satellite operators collaborating with terrestrial providers to obtain authorization for converged services. By providing clear rules, I believe we can kick start more innovation in the space economy while also expanding wireless coverage in remote, unserved, and underserved areas. We can make mobile dead zones a thing of the past. But even better, we have an opportunity to bring our spectrum policies into the future and move past the binary choices between mobile spectrum on the one hand or satellite spectrum on the other. That means we can reshape the airwave access debates of old and develop new ways to get more out of our spectrum resources.

This is exciting, so let's get to it.

Thank you to the staff who have made this latest entry in our Space Innovation Agenda possible, including Steve Buenzow, Melissa Conway, Lloyd Coward, Peter Daronco, Tom Derenge, Kaya DeRose, Kamran Etemad, Garnet Hanly, Kari Hicks, Joyce Jones, Alice Koethe, Lamine Kone, Susannah Larson, John Lockwood, Jon Markman, Roger Noel, Jess Quinley, John Schauble, Blaise Scinto, Larry Somers, Joel Taubenblatt, and Janet Young from the Wireless Telecommunications Bureau; Gregory Baker, Jennifer Gilseman, Nese Guendelsberger, Dante Ibarra, Karl Kensinger, Kathryn Medley, Kerry Murray, Robert Nelson, Stephanie Neville, Kathy O'Brien, Jim Schlichting, Tom Sullivan, Troy Tanner, and Merissa Velez from the International Bureau; Jamie Coleman, Michael Ha, Ira Keltz, Juan Montenegro, Nick Oros, Jamison Prime, Ron Repasi, Dana Shaffer, Tom Struble, and Aniqah Tahsin from the Office of Engineering and Technology; Doug Klein, David Konczal, and Bill Richardson from the Office of General Counsel; Judith Dempsey, Lonnie Hofmann, Kate Mataves, Giulia McHenry, Daniel Shiman, Don Stockdale, and Patrick Sun from the Office of Economics and Analytics; Brenda Boykin, John Evanoff, David Furth, Shabbir Hamid, Debra Jordan, David Kirschner, Ahmed Lahjouji, Erika Olsen, Rasoul Safavian, Rachel Wehr, and James Wiley from the Public Safety and Homeland Security Bureau; Loyaan Egal, Eric Ehrenreich, Kathy Harvey, Jeremy Marcus, Victoria Randazzo, and Salomon Satche from the Enforcement Bureau; and Michael Gussow, Joy Ragsdale, and Chana Wilkerson from the Office of Communications Business Opportunities.

**STATEMENT OF  
COMMISSIONER BRENDAN CARR**

Re: *In the Matter of Single Network Future: Supplemental Coverage from Space, Space Innovation, GN Docket No. 23-65, IB Docket No. 22-271, Notice of Proposed Rulemaking (March 16, 2023)*

Just a few weeks back, I was in Barcelona for this year's Mobile World Congress where regulators and industry stakeholders from across the globe gather to discuss the latest hot topics in wireless.

From the panels to the pull-asides, one issue in particular kept coming up: the emerging convergence of space and terrestrial mobile services.

And it's easy to understand why. These innovative new services embody the changing competitive landscape that consumers enjoy today. We no longer live in a world where wireline simply competes with wireline or where mobile just competes with mobile.

Increasingly we're seeing cable providers serve mobile wireless customers, while traditional mobile wireless carriers add customers to their in-home broadband services. The silos are fading away, and consumers are reaping the rewards.

The item we adopt today recognizes that consumers don't care whether the signal was beamed to their device from a tower on top of an office building or from a satellite orbiting the Earth.

They only care that they have access to an affordable, high-quality connection. Space mobile services, like those envisioned by this item, will help extend coverage even further across the country to keep consumers connected across rural and remote areas.

Today's item also helps us take another step towards extending America's space leadership. And that is good for our economy and national security.

Indeed, space—as they say—is the ultimate high ground. And space leadership has long been a priority for the U.S. However, with the space economy growing at an accelerating clip thanks to new investments from public and private sectors around the world, we must re-double our efforts to ensure America is in the driver's seat. So I have been pleased with the Commission's work in recent years towards getting our policies right.

With this new proceeding we also need to keep walking and chewing gum at the same time.

That means we need to modernize our broader regulatory framework for sat in a way that accelerates the processing of applications and encourages more providers to base their operations right here in the United States. The bipartisan "SAT Streamlining Act" by the leaders of the House Energy and Commerce Committee would do just that. I look forward to working alongside my colleagues here at the agency and Congress to advance our shared interest in extending our global leadership in space.

As we move forward in this proceeding with standing up this framework we also need to move quickly to process and approve space mobile applications that are already pending at the FCC. We can't let this new proceeding slow down those ongoing reviews.



In closing, I want to thank the staff from the Wireless Telecommunications Bureau and International Bureau for their hard work on the item before us today. It has my support.

**STATEMENT OF  
COMMISSIONER GEOFFREY STARKS**

Re: *In the Matter of Single Network Future: Supplemental Coverage from Space, Space Innovation, GN Docket No. 23-65, IB Docket No. 22-271, Notice of Proposed Rulemaking (March 16, 2023)*

As we reach for new heights in the space economy, I'm proud that American companies are continuing to lead the way. Satellite-cellular partnerships are just the latest example. By my count, they involve at least three established U.S. LEO operators, several U.S. satellite startups, leading U.S. handset and software companies, a U.S. chipmaker, and of course, our wireless carriers. That doesn't even include the U.S. satellite companies that have announced plans to deliver satellite 5G on their own or companies that have yet to announce their plans as they explore these capabilities.

As you've now heard, the satellite SOS feature on an iPhone 14 allowed a couple to reach help after their car crashed 300 feet into a canyon, with no cell service, deep in the Angeles National Forest. In the future, we're bound to see more of these examples, not just from motorists and parkgoers but from people leading their everyday lives. But the potential here goes beyond just emergency access in a rural or Tribal area, as critical as that capability may be. In particular, integrated terrestrial-satellite connectivity could also lead to a more robust and powerful IoT. I've heard time and again that the lack of coverage in the fields is holding back precision agriculture, a concern that I know many in Congress share. And don't forget the potential security benefits. In fact, the U.S. Space Force just announced plans to create a "satellite-to-cellular marketplace" so that our men and women in uniform can benefit from these systems, both on and behind the front lines. That the marketplace is intended to leverage commercial solutions should have us all stop and take notice.

How far the capability advances remains to be seen, and critical questions remain about its ultimate level of performance and the delivery models that will prevail. But given the potential here, and the surge in recent activity, we are right to make sure our rules follow suit. That's why I strongly support today's Notice of Proposed Rulemaking. The NPRM proposes a new framework for offering Supplemental Coverage from Space, or SCS. If adopted, the rules would allow satellites to step in and provide connectivity where terrestrial coverage is unavailable using terrestrial spectrum, as if they were a seamless component of the terrestrial network itself.

But building a framework that works for every conceivable commercial arrangement and every technology is no easy feat and risks bogging down progress as we work toward new rules. To address this concern, the NPRM smartly proposes a narrow set of initial entry criteria so that we can move full speed ahead on proposals that raise the fewest technical challenges, while seeking comment on how one day we might broaden the scope.

I'm glad my colleagues accepted my edits to clarify that in taking this approach, we in no way propose to shut the door on systems that do not meet our initial criteria. We've already seen signs of interest in SCS from wireless carriers that do not have nationwide spectrum, and from carriers that do but believe their non-nationwide holdings offer a better fit for the service. We've also seen interest in SCS from satellite operators that are still experimenting or do not yet have a commercial license covering the full scale of their system. And we've seen smaller and regional carriers raise concerns about being left behind, even if they join forces in the same channel to clear the way for a competitive offering. None of these scenarios would meet the initial criteria we propose due to their added complexity. But in a

marketplace this dynamic, we shouldn't stall innovation as parties work to meet the policy considerations we lay out today—especially with technologies that have the potential to improve our safety and security and bridge the digital divide.

I thank the Commission staff who worked hard to develop this outstanding proposal. It has my full support.

**STATEMENT OF  
COMMISSIONER NATHAN SIMINGTON**

Re: *In the Matter of Single Network Future: Supplemental Coverage from Space, Space Innovation, GN Docket No. 23-65, IB Docket No. 22-271, Notice of Proposed Rulemaking (March 16, 2023)*

Today the Commission adopts a proposal for a regulatory framework that allows satellite operators to offer direct-to-handset service, or as the item newly defines it, to provide “supplemental coverage from space” by combining satellite and terrestrial networks to provide service in “remote, unserved and underserved areas.”

This item explores crucial changes to FCC rules that will ensure vital and innovative services are delivered to those who need them most. It is no secret that I am a big fan of the satellite industry and I remain astounded by the rapid growth of the NGSO sector which has brought new and robust competition to the broadband marketplace. NGSO has—in fact—created a seismic shift in how FCC policymakers, Congress and others do and must assess the broadband marketplace as a whole, including how and whether to revamp the subsidy programs available to serve the very areas this service is designed to reach, and whether and how to redefine broadband service as these services come online and begin to proliferate.

As stated so succinctly in a recent article, “There is not a single regulatory framework that addresses mobile cellular devices with satellite capabilities—this unaddressed dichotomy belongs to the past [and] national satellite service licensing frameworks need to be flexible enough to allow for the smartphones of the present, because satellite direct-to-handset connectivity is an industry development that is here to stay.”

That is precisely what this item proposes to do. To wed two regulatory frameworks for a combination that, is at least intended to flexibly address the needs of all providers in this space, *for lack of a better word*. To the extent it doesn’t do that, it seeks comment on what else the FCC should and can do to facilitate these innovative services.

In that sense, this item is the beginning of the discussion about a new regulatory model and the FCC needs industry and others to tell us how to get it right. And so I look forward to a fulsome record. That said, in the meantime I do not want to see this proceeding get in the way of the FCC approving the waiver applications of providers who have sought permission to launch direct-to-handset services right now. The FCC must ensure those waiver applications move forward at a rapid clip to avoid thwarting business plans and future innovation.

I’d like to thank the staff of the wireless and international bureaus for their hard work on this item. It has my support.

Thank you.