

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

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

Comments of TechFreedom

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Summary

This proceeding could pave the way for a new era in space communications if the FCC's approach is based on innovation and interference tolerance. For the first time, we have the ability to truly close the digital divide by using space assets. As a result, the FCC should establish rules and norms that usher in a world where space-based and Earth-based systems can coexist and supplement each other in an interference-tolerated network architecture.

The FCC must reward innovation, not further entrench incumbents with a regulatory environment that provides them with all of the negotiating power. Our biggest concern with the SCS NPRM is that the regulatory regime it proposes serves only to reward incumbent terrestrial licensees and fails to create a place at the table for innovators who have pioneered these new technologies. This sends the wrong message to those seeking innovative approaches to space communications—and will stop new efforts to develop such technologies in their tracks. The Commission should revisit whether some form of a Pioneer's Preference could be utilized in conjunction with SCS to reward the space communications pioneers.

The FCC should only grant SCS authorizations to U.S. licensees. Whatever wisdom there may have been for an "open skies" policy allowing foreign licensees access to U.S. markets, such a policy is not applicable here, given the extensive coordination and integration SCS will require with terrestrial systems. The FCC's "open skies" policies have led to a flight offshore to seek licenses from other jurisdictions without either expertise or inclination to regulate in the public interest. This flight has included many U.S. companies, who have found "flag of convenience" jurisdictions that will license their operations far quicker and more cheaply than can the FCC. Entertaining market access petitions for SCS will further exacerbate this flight.

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COMMENTS OF TECHFREEDOM

Pursuant to Sections 1.415 and 1.419 of the Commission’s rules,¹ TechFreedom submits comments in response to the Commission’s Notice of Proposed Rulemaking (NPRM) in the above-referenced proceedings related to Supplemental Coverage from Space (SCS).² In support of these comments, TechFreedom submits:

I. About TechFreedom

TechFreedom is a nonprofit think tank dedicated to promoting the progress of technology that improves the human condition. To this end, we seek to advance public policy that makes experimentation, entrepreneurship, and investment possible, and thus unleashes the ultimate resource: human ingenuity.

¹ 47 C.F.R. §§ 1.415 and 1.419.

² Single Network Future: Supplemental Coverage from Space, Notice of Proposed Rulemaking, FCC 23-22 (Mar. 17, 2023) (hereinafter SCS NPRM). The NPRM appeared in the Federal Register on April 12, 2023, 88 Fed. Reg. 21944 (Apr. 12, 2023), and set the comment date as May 12, 2023, and the reply date as June 12, 2023. These comments are timely filed.

TechFreedom and undersigned counsel have a long history advocating for innovative uses of outer space. The instant proceeding sits at the intersection of FCC regulation and space law, a place we've inhabited for decades.³ We are uniquely suited to provide commentary in this important proceeding.

II. The SCS NPRM Sets the Stage for a New Era in Space Communications Based on Innovation and Interference Tolerance

TechFreedom applauds the Commission's issuance of the SCS NPRM. This proceeding presents a unique opportunity for the Commission to begin to craft an entirely new regime for leveraging innovative uses of space to provide enhanced services to the people of Earth. As we've said before about in-space servicing, assembly, and manufacturing (ISAM), the advent of the "second space race" provides the Commission with the opportunity to truly reassess its approach to space spectrum allocation and how the space economy can benefit life on Earth:

[A]n entirely new approach to spectrum for ISAM should be explored in this proceeding and beyond. Far from trying to pigeonhole ISAM into existing licensing structures, the Commission should begin with a "white sheet of

³ TechFreedom Comments on Space Innovation & Facilitating Capability for In-Space Servicing, Assembly, and Manufacturing, IB Docket Nos. 22-271 & 22-272 (Oct. 31, 2022), <https://techfreedom.org/wp-content/uploads/2022/10/TechFreedom-Comments-FCC-ISAM-NOI.pdf> (hereinafter TF ISAM Comments); TechFreedom Comments on Development of a National Spectrum Strategy, Docket No. 230308-0068 (Apr. 17, 2023), <https://techfreedom.org/wp-content/uploads/2023/04/Comment-NTIA-RFC-4-17-23.pdf>; TechFreedom Comments on Initial Processing of Satellite and Earth Station Applications & Space Innovations, IB Docket Nos. 22-411 & 22-27 (Mar. 3, 2023), <https://techfreedom.org/wp-content/uploads/2023/04/Comment-NTIA-RFC-4-17-23.pdf>; *Artemis Accords: One Small Step for NASA, Not So Giant a Leap for Space Law*, TECHFREEDOM (May 15, 2020), <https://techfreedom.org/artemis-accords-one-small-step-for-nasa-not-so-giant-a-leap-for-space-law/>; *Revived National Space Council Could Mean Space Policy Rethink*, TECHFREEDOM (July 7, 2017), <https://techfreedom.org/revived-national-space-council-mean-space-policy-rethink/>; James E. Dunstan, "Space Trash:" *Lessons Learned (and Ignored) from Space Law and Government*, 39 J. OF SPACE L. 23 (2013).

paper” to develop a spectrum regime for ISAM, indeed for all future commercial activities in space, that is flexible, speedy, and economical.⁴

For the first time, we have the ability to truly close the digital divide by using space assets. Indeed, notwithstanding claims that such a closure can be accomplished with the current federal funding, there are places in the United States, and especially in other portions of the world, where terrestrial deployment of services, even emergency calling service, may not be possible.⁵

In crafting new rules for SCS operations, the FCC should be guided by two words: Innovation and Interference. The FCC should establish rules and norms that usher in a world where space-based and Earth-based systems can coexist and supplement each other in an interference-tolerated network architecture. In doing so, however, the FCC must reward innovation, not further entrench incumbents with a regulatory environment that provides them with all the negotiating power.

⁴ TF ISAM Comments, *supra* note 3, at 11.

⁵ See generally TechFreedom Comments on Implementing the Infrastructure Investment and Jobs Act: Prevention and Elimination of Digital Discrimination, GN Docket No. 22-69 (Feb. 21, 2023), <https://techfreedom.org/wp-content/uploads/2023/02/TechFreedom-Comments-on-FCC-Nondiscrimination-NPRM-2.21.23.pdf>; TechFreedom Reply Comments on Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment, WC Docket No. 17-84 (Aug. 26, 2022), <https://techfreedom.org/wp-content/uploads/2022/08/TechFreedom-Reply-Comments-Pole-Replacement-8-26-22.pdf>; TechFreedom Reply Comments on Facilitating Interagency Coordination of Broadband Deployment Funding, WC Docket No. 22-251 (Aug. 16, 2022), <https://techfreedom.org/wp-content/uploads/2022/08/TechFreedom-Reply-Comments-Interagency-Coordination-8-16-22.pdf>.

A. The Lack of Greenfield Spectrum and Limited Space Frequency Allocations Demand an Innovative Regulatory Approach

The days of finding unused or underutilized (“greenfield”) spectrum are all but over.⁶ Henceforth, any reallocation of spectrum will require either moving incumbent users or requiring them to operate in a higher-interference environment.⁷ Couple this with decades of taking spectrum away from space uses,⁸ and the Commission must seek an innovative approach to reusing terrestrial spectrum to, from, and in space. What terrestrial cellular telephone technology delivered in the 1980s⁹ can now be replicated by reusing this spectrum in space applications that complement, but don’t interfere with, terrestrial

⁶ TechFreedom Comments on Development of a National Spectrum Strategy at 3, Docket No. 230308-0068 (Apr. 17, 2023), <https://techfreedom.org/wp-content/uploads/2023/04/Comment-NTIA-RFC-4-17-23.pdf> (“The days of ‘greenfield’ spectrum laying fallow are all but gone.”); *see also* Letter from FCC Chair Jessica Rosenworcel to Sen. Thune (Mar. 30, 2022), <https://docs.fcc.gov/public/attachments/DOC-382219A3.pdf> (“Greenfield spectrum—open and cleared for use—is no longer simple or easy to find. In addition, repurposing spectrum for burgeoning new services often requires lengthy and complex bureaucratic processes.”).

⁷ TechFreedom Comments on National Spectrum Strategy at 3, Docket No. 230308-0068 (Apr. 17, 2023), <https://techfreedom.org/wp-content/uploads/2023/04/Comment-NTIA-RFC-4-17-23.pdf>.

⁸ James E. Dunstan, *Earth to Space - I Can't Hear You: Selling Off Our Future To The Highest Bidder*, Proceedings of the Thirteenth Space Studies Institute/Princeton Conference on Space Manufacturing (1997), <https://techfreedom.org/wp-content/uploads/2020/10/SSI-1997-Earth-to-Space-I-cant-Hear-You.pdf>.

⁹ *See* Bill Gourgey, *When 1970s Cellular Technology Made ‘Traveling Telephones’ More Accessible*, POPULAR SCIENCE (May 5, 2022, 7:00 AM), <https://www.popsci.com/technology/cellular-technology-emergence/> (“In 1974, to address pent-up demand, the FCC released more spectrum but insisted that companies find a better way to use it. As [Popular Science Reporter John] Mason explains with geeky precision, cellular technology got its name from its design, deploying short-range transmission towers to divide large regions, like cities, into honeycomb-shaped cells, enabling frequency reuse. More than any other technology, cellular (first conceived in 1948 but not computationally practical until the 1970s) paved the way for the mobile era.”).

applications. We've urged the FCC to take this approach before.¹⁰ The SCS NPRM is a vital first step.

1. Flexible Use Spectrum, and Especially CMRS Spectrum, Provides the Perfect Testbed for Space Reuse of Frequencies

What created the cellular telephone revolution in the 1980s was a system architecture designed to reuse frequencies, and key, the ability to simply disregard weaker signals in order to transmit voice and data over the strongest signal path.¹¹ These systems were designed to deal with “interfering” signals by simply rejecting them. It doesn't matter whether the signals emanate from a terrestrial tower further away, and soon (if the Commission can resolve all of the issues presented in this proceeding), from a spacecraft. Similar architectures are used throughout most of the CMRS bands. These should be the first bands that the FCC looks to in implementing SCS.

2. Initial Licenses Should Only Be Granted When Used with Existing Handsets and Not Interfere with Terrestrial Operations.

Integrating a space component into terrestrial CMRS systems is the logical first step in this proceeding. As the NPRM points out, however, the true advantage of SCS is that it can be implemented to operate with existing consumer handsets.¹² At this stage of the

¹⁰ TF ISAM Comments, *supra* note 3, at 18 (“Because the existing space operations spectrum is so limited, the Commission should explore spectrum allocations in other bands, including those currently licensed for terrestrial uses, which could be reused on a non-interference basis in space.”).

¹¹ GUOWANG MIAO ET AL., FUNDAMENTALS OF MOBILE DATA NETWORKS 177 (2016), <https://doi.org/10.1017/CBO9781316534298> (“Such sharing or reuse of radio spectrum is a dominant feature of present-day wireless systems where a tremendous number of devices have wireless connectivity.”).

¹² SCS NPRM, *supra* note 2, at ¶ 3 (“As technologies with advanced capabilities evolve and wireless customers' demand for seamless connectivity grows, even in remote locations currently lacking

proceeding, the FCC should adopt rules which require SCS coverage to be provided to existing handsets only, and not require consumers to purchase additional equipment. The FCC should resist the temptation to widen the scope of this proceeding, at least for now, to proposals to reuse terrestrial frequencies which would require additional consumer-side equipment.¹³

Similarly, such SCS licenses should specifically limit the power used in two ways:

- 1) Limit the Power Flux Density (PFD) into terrestrial systems such that the satellite signal would be rejected in favor of a terrestrial signal so long as that terrestrial signal can carry the voice or data.¹⁴ This is necessary both so that the satellite system doesn't "steal" a signal that can be processed by a terrestrial tower, but

wireless coverage, stakeholders are seeking ways to leverage satellite communications to provide expanded coverage to consumer handsets"); ¶ 59 ("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"); ¶ 78 ("our proposed framework is primarily intended to facilitate SCS to existing consumer handsets").

¹³ See SCS NPRM, *supra* note 2, at ¶ 59 ("the proposed framework does not contemplate authorizing a standalone satellite service to specially provisioned satellite-only devices using terrestrial spectrum."). TechFreedom would support the issuance of a further notice of proposed rulemaking to specifically address the issue of whether SCS could be used to support IoT applications that do not interfere with traditional voice and data uses of the terrestrial spectrum. SCS NPRM, *supra* note 2, at ¶¶ 9, 30, n. 105.

¹⁴ See SCS NPRM, *supra* note 2, at ¶¶ 113-14. Although the NPRM suggests that the PFD limit should be negotiated, ¶ 113, we believe that the technical rules for the service should specify an upper PFD limit low enough to ensure that the satellite component does not take over the signal where there is a terrestrial tower able to complete the connection. SCS NPRM, *supra* note 2, at ¶ 114. See also SCS NPRM, *supra* note 2, at ¶ 49 ("Are these the correct licensing requirements to apply for authorization to provide SCS or would other, or additional, criteria be more appropriate?").

also to ensure that the satellite system isn't overwhelmed in handling traffic that can be routed over terrestrial infrastructure.¹⁵

- 2) Limit the transmit power of handsets to existing levels.¹⁶ It has been suggested that one way for consumer handsets to connect with satellite systems on traditional CMRS frequencies would be for the handsets to operate at or above maximum power levels.¹⁷ While the idea of boosting a handset's power in an emergency might seem attractive, it could just drain a user's battery in failed attempts to connect with a satellite system, rendering the device useless until it can be plugged in again.

If the Commission adopts these two technical standards into its SCS rules, SCS operations should be compatible with terrestrial networks and existing consumer hardware such that terrestrial networks are not interfered with, and consumers won't even notice the overlay of an SCS operator on their phone.

¹⁵ Limiting the power flux density at the Earth's surface of SCS operations would further mitigate the Commission's concerns about protecting future terrestrial entrants in the 800 MHz cellular band. SCS NPRM, *supra* note 2, at ¶ 39 ("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.").

¹⁶ See SCS NPRM, *supra* note 2, at ¶ 127.

¹⁷ See Bob O'Donnell, *SpaceX, T-Mobile race to put an end to cell phone dead zones with help from outer space*, USA TODAY (Aug. 31, 2022, 12:57 PM), <https://www.usatoday.com/story/tech/2022/08/30/spacex-t-mobile-cell-phone-dead-zones-space-satellite/7937525001/> ("it's not entirely clear how much of a power drain connecting to the low power signals from the satellite will cause and how it will impact your phone's battery life."). See also *The Future of Communication = Wireless + Satellite*, CELITECH (Sept. 10, 2022), <https://www.celitech.com/blog/the-future-of-communication-wireless-satellite> ("Accordingly, a new smartphone will be needed to seamlessly offer satellite internet in remote areas while preserving the phone's battery life. The first such phone might be the upcoming iPhone 14.").

III. The FCC Should Reward Innovators, Not Incumbents

Our biggest concern with the SCS NPRM is that the regulatory regime it proposes serves only to reward incumbent terrestrial licensees and fails to create a place at the table for innovators who have pioneered the specific new technologies required for SCS. This sends the wrong message to those seeking innovative approaches to space communications and will stop new efforts to develop such technologies in their tracks.

A. The FCC Should Revisit Something Akin to a “Pioneer’s Preference” in Conjunction with SCS

The Commission established the Pioneer’s Preference in 1991 to reward innovation and “to encourage the development of new services and technologies.”¹⁸ Although much maligned¹⁹ and ultimately dismantled by Congress,²⁰ the program attempted to place innovation front and center in frequency allocation and licensing. This approach deserves a fresh look from the FCC in this proceeding, to determine if there are ways to reward innovators who have contributed to the technologies necessary to implement SCS. While exclusive licensing may have been prohibited by Congress in 1997, it is less clear whether

¹⁸ See *In re Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services*, Report and Order, Gen. Doc. No. 90-217, 6 FCC Rcd 3488, ¶ 32 (1991) (“Our objective in establishing a pioneer’s preference is to reduce the risk and uncertainty innovating parties face in our existing rule making and licensing procedures, and therefore to encourage the development of new services and new technologies.”).

¹⁹ See, e.g., Kulpreet Singh, *The FCC’s Pioneer Preference Policy: An Innovative Idea Grows Old and Weary*, 22 RUTGERS COMPUT. & TECH. L.J. 153 (1996); John Friedman, Note: *Fostering Development of Advanced Telecommunications Technologies: The F.C.C., The Pioneer’s Preference & Personal Communications Services*, 12 CARDOZO ARTS & ENT. L.J. 545, 567 (1994).

²⁰ See *Balanced Budget Act of 1997*, Pub. L. 105-33, 111 Stat. 251 (1997); 47 U.S.C. § 309(j)(13). See also *Commission Terminates Pioneer’s Preference Program; Dismisses All Pending Pioneer’s Preference Requests*, FCC Report No. ET 97-7 (Sept. 4, 1997), https://transition.fcc.gov/Bureaus/Engineering_Technology/News_Releases/1997/nret7012.html.

some form of licensing preferences can be granted in order to reward innovators, especially here, where the spectrum will not be auctioned. For example, the Commission might contemplate holding a separate processing round for new entrants that currently hold experimental licenses for SCS operations.²¹

B. Authorizing SCS Operations Only for Existing Part 25 Licensees with Existing Leases with Terrestrial CMRS Operators Narrows the List of Potential Licensees to a Handful of Incumbents

The SCS NPRM goes to great length to highlight the tremendous work put in by innovators who have potentially “cracked the code” on how to make satellite systems compatible with terrestrial cellular architectures and existing consumer handsets.²² The SCS NPRM concludes that “Technological innovation and creative applications can pave the way for new spectrum use cases that promote spectrum efficiencies and serve the public interest.”²³ The SCS NPRM later asks, “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?”²⁴ Finally, the Commission “request[s] that commenters address the extent to which imposing excessive restrictions would reduce contractual flexibility or reduce incentives to negotiate agreements to provide SCS.”²⁵

²¹ See SCS NPRM, *supra* note 2, at ¶ 58 (discussing the potential need for processing rounds).

²² SCS NPRM, *supra* note 2, at ¶¶ 4-15.

²³ SCS NPRM, *supra* note 2, at ¶ 24.

²⁴ SCS NPRM, *supra* note 2, at ¶ 56.

²⁵ SCS NPRM, *supra* note 2, at ¶ 144.

Yet the SCS NPRM then turns around and guts this paradigm by layering on “excessive restrictions,” by proposing to license only existing Part 25 licensees and market access grantees,²⁶ and only after terrestrial licensees holding licenses covering the entire continental United States (CONUS) have agreed to participate by leasing their terrestrial spectrum to incumbent satellite license holders.²⁷ This cuts the potential players down to a few satellite providers and even fewer terrestrial licensees. This could become a classic case of the rich getting richer.²⁸ Instead, the Commission should take a broader view of how to authorize SCS.²⁹

C. Limiting SCS Licensing to Incumbent Part 25 Licensees Squeezes out the Innovators

While the FCC may believe this arrangement will speed deployment of SCS services, the opposite may well be the case, because such an approach essentially freezes out the

²⁶ SCS NPRM, *supra* note 2, at ¶¶ 42, 48. The SCS NPRM’s statement that the FCC will entertain “requests for rule waiver, special temporary authority, and experimental authorization, relating to supplemental satellite coverage proposals” during the pendency of this proceeding, SCS NPRM, *supra* note 2, at ¶ 43, does not solve the problem of licensing only existing Part 25 entities.

²⁷ SCS NPRM, *supra* note 2, at ¶ 45.

²⁸ This “incumbents-only” approach also sends the wrong message to those interested in other innovative activities in space. As we pointed out in our ISAM comments, the FCC should look for other innovative uses of spectrum to fuel the upcoming cislunar economic development. *See* TF ISAM Comments at 16-17. If all such new space frequency uses are to be licensed only to incumbents, the FCC may well be strangling the future space economy by declaring that the winners will be those already licensed by the Commission. Entrepreneurs predictably will abandon their activities in these areas to focus on technologies for which the market (and regulators) are willing to reward fundamental innovation. Or worse, as discussed *infra*, such an approach will only serve to drive even more U.S. companies offshore to seek flag of convenience authorizations.

²⁹ *See* SCS NPRM, *supra* note 2, at ¶ 24 (“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.”).

majority of existing innovators who have pioneered the technologies necessary to make SCS work. Many of these innovators are not currently Part 25 licensees precisely because what they are proposing to do does not square with the current table of allocations, and there hasn't been a clear pathway to secure a Part 25 license.³⁰ Establishing the prerequisite of a Part 25 license will consolidate power in the existing incumbent licensees at the same moment when SCS systems using cheaper satellites and cheaper launches have closed several business cases and are ready to move into operations.³¹ Having developed, and in some cases deployed, these innovations, these newcomers could discover that the biggest barrier to success is regulatory. As proposed, regulatory hurdles may kill these innovative players.

D. Requiring a Spectrum Lease from Terrestrial Licensees in order to Apply for an SCS License Places Too Much Power in Terrestrial Incumbents

Second, the Commission's proposed approach gives terrestrial licensees a "pocket veto" on deploying new and innovative technologies that would not interfere with the incumbent's systems. In this way, the Commission is not protecting incumbents from interference, it is protecting incumbents from potential competition, even in geographic areas to which incumbents are unable or unwilling to deploy.³² Rather than being rewarded for their hard work and innovation, innovators must come, hat in hand, and beg the terrestrial licensees to allow them to proceed. Given this power, coupled with the terrestrial

³⁰ See SCS NPRM, *supra* note 2, at ¶ 48.

³¹ SCS NPRM, *supra* note 2, at ¶ 8.

³² See SCS NPRM, *supra* note 2, at ¶ 52 ("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.").

licensees' already formidable position in the market, one can only imagine the terms that terrestrial incumbents will be able to extract.³³

The Commission should revisit this approach in both respects. First, the Commission should establish a pathway to acquire a Part 25 license for any grantee of an experimental license that has demonstrated success in deploying and operating a spacecraft using any of the frequencies contemplated in the NPRM.³⁴

Second, the FCC should grant Part 25 licenses to all applicants that can satisfy existing satellite processing guidelines (not the expanded ones contemplated in the SCS NPRM), but condition operations under such licenses on either: a) producing a lease (or other similar documentation) with a terrestrial license holder; or b) demonstrating that its operations would not interfere with terrestrial use of such frequencies.³⁵

IV. SCS Authorizations Should Only Be Awarded to FCC Licensees, Not Foreign Entities Seeking Market Access

SCS represents a bold approach to rethinking frequency use in the United States. As such, the Commission should limit SCS authorization only to U.S. licensees, so it can fully monitor and enforce its new rules. Whatever wisdom there may have been for an “open

³³ TechFreedom has no doubt but that in many instances these smaller innovators might fail or be absorbed by larger players. That's what free markets are for. Stack the regulatory deck to put all the negotiating power in the hands of large incumbents, however, and the market dynamics are destroyed to allow rent seeking by incumbents.

³⁴ See SCS NPRM, *supra* note 2, at ¶¶ 18-23.

³⁵ See SCS NPRM, *supra* note 2, at ¶ 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?”).

skies” policy allowing foreign licensees access to U.S. markets,³⁶ those policies are not applicable here, given the extensive coordination and integration SCS will require with terrestrial systems.³⁷ Moreover, the FCC’s “open skies” policies have led to a flight offshore to seek licenses from other jurisdictions without either expertise or inclination to regulate in the public interest. This flight has included many U.S. companies, who have found “flag of convenience” jurisdictions that will license their operations far quicker and more cheaply than can the FCC.³⁸ Entertaining market access petitions for SCS will further exacerbate this flight, especially if the Commission adopts a policy of only licensing existing Part 25 licensees (while still entertaining future market access petitions from foreign-licensed companies). Instead, the FCC should only grant SCS authorizations to U.S. licensees.

V. Other Specific Responses to the SCS NPRM

In this section we address a number of other requests for comments contained in the SCS NPRM.

³⁶ See Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service, Report and Order, 12 FCC Rcd 14220 (July 18, 1997).

³⁷ Such integration also raises huge national security interests, which the 1997 Order alluded to, Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service, Report and Order, 12 FCC Rcd 14220 at ¶¶ 15, 29 (July 18, 1997), but which have escaped thorough review by the Commission on a case-by-case basis.

³⁸ Adrian Taghdiri, *Flags of Convenience and the Commercial Space Flight Industry*, 19 B.U. J. Sci. & TECH. L. 405, 422 (2013) (“Further, the FAA and the Federal Communications Commission also consider orbital debris issues in the spacecraft licensing process. Consequently, these established domestic regulations increase the incentive for space-faring companies to register in flag of convenience states.”).

A. The Commission Should Amend the Table of Allotments as Proposed in the SCS NPRM

TechFreedom supports the majority of the proposals for amending the current Table of Allotments in Part 2 to accommodate SCS. We agree that the Commission should adopt a footnote indicating that the allocation is on a co-primary basis,³⁹ but governed by specific operational rules adopted in this proceeding.⁴⁰ We also support the allocation of these frequencies on a bidirectional basis to support maximum flexibility.⁴¹

B. No Separate Earth Station License Should Be Required for SCS Licensing

The SCS NPRM contemplates licensing SCS operations in a manner similar to other space frequency licensing; to wit, the FCC would issue a separate space station license and earth station license.⁴² This is stovepipe thinking, and there is no reason to replicate an archaic licensing regime for SCS. The FCC should not issue separate Earth station licenses for existing consumer equipment already in the field. If technical rules are adopted to allow operation with existing consumer equipment, the existing Part 2 equipment authorization process should be sufficient to ensure that handsets communicating with satellites do not disrupt or otherwise interfere with terrestrial networks.⁴³ Layering on a blanket earth station license to the phones we carry in our pockets today is the height of regulatory make-work.

³⁹ SCS NPRM, *supra* note 2, at ¶ 26.

⁴⁰ SCS NPRM, *supra* note 2, at ¶ 27.

⁴¹ SCS NPRM, *supra* note 2, at ¶ 32.

⁴² SCS NPRM, *supra* note 2, at 61-64.

⁴³ *See* 47 CFR Part 2, Subpart J.

C. SCS Operators Should Be Subject to 911 Obligations, but Not WEA Requirements

One of the huge selling points for SCS is the ability for consumers to make emergency calls in areas not covered by traditional terrestrial networks.⁴⁴ The SCS NPRM seeks comment on whether SCS providers should be required to provide 911 services.⁴⁵ TechFreedom supports extending 911 requirements to SCS operators to the extent possible given their network architecture.⁴⁶

As documented in the SCS NPRM, however, SCS operations may not be compatible with the Wireless Emergency Alert (WEA) system, given WEA's rules requiring specific geo-targeting of such alerts.⁴⁷ We do not believe, at least in the first iteration of SCS deployment, that the required level of geofencing can be achieved. Requiring SCS operators to engineer in the technology necessary for this level of geo-targeting would certainly slow down SCS deployment, if not lead many potential entrants to abandon their proposals.

⁴⁴ See SCS NPRM, *supra* note 2, at ¶¶ 1, 4, 10, 25 (“Our proposal could also create significant public safety benefits, including rural service and emergency coverage in areas that terrestrial networks do not reach.”).

⁴⁵ SCS NPRM, *supra* note 2, at ¶¶ 83-91.

⁴⁶ SCS operators that do not carry voice traffic, for example, should nonetheless provide 911 text capabilities. SCS NPRM, *supra* note 2, at ¶ 83, n. 202 (noting that T-Mobile and SpaceX plan to begin SCS-like operations with a text-only service).

⁴⁷ SCS NPRM, *supra* note 2, at ¶ 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”).

D. The FCC Should Adopt Part 25 Buildout Milestones Rather than Terrestrial Milestones

The SCS NPRM seeks comment on what buildout milestones the Commission should apply to SCS operations.⁴⁸ TechFreedom supports application of Part 25 buildout requirements to SCS.⁴⁹ References in the SCS NPRM to terrestrial wireless service buildout requirements⁵⁰ are confusing and counterproductive. The obligations to implement SCS operations should always remain separate from any buildout obligations a terrestrial licensee (or lessee) of the same frequency has. Further, we oppose the notion that a terrestrial licensee could use SCS operations to avoid any buildout obligations it might have for its terrestrial licenses.⁵¹ SCS operations should always be in addition to, not instead of, terrestrial deployment, especially if such terrestrial deployment is facilitated through government funding programs such as RDOF or BEAD.

⁴⁸ SCS NPRM, *supra* note 2, at ¶¶ 100-104.

⁴⁹ SCS NPRM, *supra* note 2, at ¶ 102 (“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.”).

⁵⁰ SCS NPRM, *supra* note 2, at ¶ 101.

⁵¹ SCS NPRM, *supra* note 2, at ¶ 72 (“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. 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. 181 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.”).

E. The FCC Should Explore the 2.5 GHz Band for SCS Operations

Finally, the SCS NPRM asks whether there are other frequency bands which could be explored for SCS use.⁵² One specific band suggested⁵³ is the 2.5 GHz (2496-2690) band recently reallocated for more flexible use.⁵⁴ The 2.5 GHz band “is the single largest band of contiguous spectrum below 3 gigahertz,” and “has lain fallow for more than twenty years.”⁵⁵ Early installation of new equipment by tribal entities which received a tribal priority in licensing indicates that the performance of this mid-band spectrum meets or exceeds expectations.⁵⁶ TechFreedom supports efforts by the FCC to gain maximum use for this spectrum, including rule changes necessary to include the 2.5 GHz band in SCS operations.⁵⁷

⁵² SCS NPRM, *supra* note 2, at ¶ 138.

⁵³ SCS NPRM, *supra* note 2, at ¶ 143 (“we seek comment on the unique circumstances regarding the 2.5 GHz band.”).

⁵⁴ See Transforming the 2.5 GHz Band, Report and Order, 34 FCC Rcd 5446 (2019).

⁵⁵ *Id.* ¶ 3.

⁵⁶ See James E. Dunstan, *The FCC, 2.5 GHz Spectrum, And The Tribal Priority Window: Something Positive Amid The COVID-19 Pandemic*, TECHDIRT (Dec. 9, 2020), <https://www.techdirt.com/2020/12/09/fcc-25-ghz-spectrum-tribal-priority-window-something-positive-amid-covid-19-pandemic/> (“Early data indicate that the 2.5 GHz spectrum is performing well above theoretical predictions, even on the topographically diverse Navajo Nation. Students who previously had no affordable and reliable broadband service because the total lack of wireline infrastructure can now continue their studies from home. Those relatively close to the towers where 2.5 GHz spectrum antennas are deployed are enjoying 25 Mbps download and 6 Mbps upload speeds. One student lives more than four miles away, and not within line-of-site of the tower, yet is still getting consistent speeds of 8 Mbps down and 10 Mbps up. And that’s with first-generation gear, sure to improve as the 2.5 GHz spectrum is further developed and deployed.”).

⁵⁷ Given the number of Native American Tribes, especially tribes in rural areas, see *2.5 GHz Rural Tribal Maps*, FCC, <https://www.fcc.gov/25-ghz-rural-tribal-maps> (last visited May 10, 2023), the Commission should engage in consultations with tribes to work through any unique licensing requirements for this band. See SCS NPRM, *supra* note 2, at ¶ 143 (“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?”).

VI. Conclusion

Supplemental Coverage from Space represents exactly the type of innovative spectrum usage that the Commission needs to close the digital divide. TechFreedom fully supports these efforts. But such radical new thinking in terms of engineering needs to be met with radical thinking by regulators, not attempts to pigeonhole new frequency uses into outdated regulatory models. The Commission should move to break down stovepipes in its regulatory approach to usher in a new revolution in network architecture that will rival those introduced in the 1980s with cellular systems' frequency reuse paradigms.

Respectfully submitted,

_____/s/_____

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What are the costs and benefits to allowing this service, and what, if any, different rules should apply to this or similar bands?).