

January 2, 2024

VIA EMAIL

Mr. Scott Blake Harris
Director, National Spectrum Strategy
Telecommunications and Information Administration
U.S. Department of Commerce
1401 Constitution Avenue NW
Washington, D.C. 20230
NSSimplementationplan@ntia.gov

**Re: Implementation of the National Spectrum Strategy;
Federal Register Doc. 2023–26810**

Dear Mr. Harris,

Spire Global, Inc. (“Spire”) respectfully submits these comments in response to the National Telecommunications and Information Administration’s (“NTIA”) above-referenced notice of opportunity for public input regarding the development of an implementation plan for the Presidential Memorandum Modernizing United States Spectrum Policy and Establishing a National Spectrum Strategy and the National Spectrum Strategy (“Strategy”).¹ Specifically, Spire encourages NTIA to focus its implementation efforts on facilitating and streamlining the existing spectrum sharing processes between incumbent Federal and non-Federal Earth exploration satellite service (“EESS”) operators, particularly in the shared 8025-8400 MHz band (“X-band”), thereby addressing the spectrum needs of a rapidly growing segment of the U.S. space industry.

I. INTRODUCTION

Spire is a global leader in space-based data, analytics, and space services, offering unique datasets and powerful insights about the Earth. Spire’s data and solutions are used worldwide by commercial and government organizations to gain advantages, facilitate innovation, and tackle some of the world’s greatest challenges, including climate change and global security.

With over 100 satellites on orbit, Spire owns and operates the world’s largest multi-purpose EESS constellation, provisioning critical observation data and analytics across several key industries, including aviation, shipping, oil and gas, and transportation. In recent years, Spire has also expanded its service offerings to its customers to include “space-as-a-service;” enabling customers to take advantage of flight proven Spire platforms and mission management capabilities for purposes of operating their own equipment or software on orbit. Spire’s proprietary analytics capabilities are then used to enrich the data acquired by its satellites and customer payloads to

¹ See Implementation of the National Spectrum Strategy, Notice of opportunity for public input, 88 Fed. Reg. 85266 (Dec. 7, 2023) (“Notice”); Modernizing United States Spectrum Policy and Establishing a National Spectrum Strategy, Presidential Memorandum, 88 Fed. Reg. 80079 (Nov. 17, 2023); National Spectrum Strategy, NTIA (Nov. 13, 2023), https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf (“Strategy”).

provide additional insights that help organizations and governments make more informed decisions for the betterment of all.

Spire has worked closely with the U.S. government—particularly NTIA and the Federal Communications Commission (“FCC”)—to license and coordinate its growing constellation to add additional spectrum and deploy technological advancements and novel services through small satellite technology.² These relationships are critical as Spire provides its industry-leading sensing capabilities exclusively in spectrum bands that are shared with Federal users on a co-primary basis in the United States, namely in the UHF, S-, X-bands.³ The Notice provides a welcome opportunity—particularly as EESS operators seek access to additional spectrum and to diversify business models to include space-as-a-service offerings to customers—to ensure that the Implementation Plan effectively considers the immediate and long-term needs of this high-value, high-growth industry. To that end, Spire encourages NTIA to work closely with the FCC to protect non-Federal EESS access to X-band spectrum and exclude the band from near-term consideration for repurposing.

II. NTIA SHOULD PRESERVE THE X-BAND FOR EESS, PROVIDING FOR THE GROWTH AND INNOVATION OF THE SATELLITE SERVICE IN THE BAND

The Strategy rightly acknowledges that to “continue our Nation’s economic growth, to maintain and improve our global competitiveness, and to support critical public services and missions, we must make spectrum available for innovative new uses and to meet growing demand.”⁴ The Strategy further recognizes that this “spectrum pipeline” will encompass spectrum bands that will vary in maturity, ripeness, and appropriateness to target for repurposing.”⁵ It is within that context that Spire and several other commenters encourage NTIA to structure the implementation plan to sufficiently account for incumbent users in bands identified for study, and prioritize bands (or band segments) that are not primarily allocated for non-Federal use.

The X-band is the anchor spectrum for a significant portion of EESS downlink operations both in the United States and globally. The combination of ideal propagation characteristics and minimal interference risks between remote sensing operators in the X-band facilitates innovation and growth through careful coordination among stakeholders. Dozens of non-Federal operators (including commercial operators⁶ and educational institutions) are able to share and coordinate the downlink of terabytes of data over 375 MHz of bandwidth and a handful of gateway ground

² See generally Comments of Spire Global, Inc., Docket No. NTIA-2023-0003 (Apr. 17, 2023); see also IBFS File Nos. SAT-MOD-20200603-00065 & SAT-MPL-20200618-00078.

³ In the United States, Spire is authorized to operate in the 401-402 MHz (space-to-Earth), 402-403 MHz (Earth-to-space), 449.75-450.25 MHz (Earth-to-space), 2020-2025 MHz (space-to-Earth), 2025-2110 MHz (Earth-to-space), 2025-2026 MHz (space-to-space), 2200-2290 MHz (space-to-Earth), and 8025-8400 MHz (space-to-Earth). Spire is also authorized for receive-only operations in the Automatic Identification System 1-4 bands, Automatic Dependent Surveillance-Broadcast bands, GPS L1 and L2, and Galileo E1 and E5.

⁴ Strategy at 3.

⁵ *Id.*

⁶ Commercial here is used in the ordinary business sense, and includes those operators holding Part 25 commercial licenses and market access grants, as well as Part 5 experimental licenses.

stations—while facilitating future entry—because EESS operations can limit transmissions to when a satellite is directly overhead of the relevant ground station. Moreover, with the advent of space-as-a-service, existing constellations are able to host additional equipment that utilize spectrum-compatible radios and sensors, allowing companies to further take advantage of existing space and ground architectures and coordination agreements.⁷ As a result, the X-band is critical for EESS operators and remains a fundamental growth band for new and continuing Earth observation and space-as-a-service satellite operations.

The indispensable value of Earth observation lies in the service’s ability to image, sense, or otherwise monitor the entire planet from space all while using minimal—but globally harmonized—spectrum. This judicious and efficient use of spectrum ensures the delivery of timely, relevant, and actionable information to governments and consumers. Repurposing the X-band spectrum for mobile use within the United States would disrupt Earth observation missions both domestically and globally and jeopardize the availability of critical information necessary for both public and private applications, including U.S. national security.

Allocations in the X-band must therefore be preserved for EESS on a primary basis.⁸ Any long-term planning for the X-band should focus on enhancing coordination among the existing Federal and non-Federal users of the band, ensuring continued U.S. leadership in the Earth exploration services, rather than seeking ways to repurpose the band for new entrants who may interfere with or otherwise hinder incumbent operations. NTIA should direct study of the X-band to include (i) streamlining and improving the transparency of coordination procedures regarding non-Federal EESS use of the X-band; and (ii) identification of segments of the X-band for exclusive non-Federal EESS operations, as well as future space-to-space allocations.

III. IF INCLUDED IN THE IMPLEMENTATION PLAN STUDIES, NTIA SHOULD PRIORITIZE PROTECTION OF INCUMBENT CO-PRIMARY SERVICES IN THE X-BAND

In addition to the Federal users, most of the spectrum identified by the Strategy is currently utilized by some non-Federal services. It is therefore imperative that any study of an identified band objectively weigh the potential risks of harm to incumbent users and, in the event a study were to demonstrate such risk of interference to incumbent users, NTIA should conclude that no changes are to be made the allocations of the studied band, as acknowledged in the Strategy.⁹ As recent proceedings before the FCC have demonstrated, sharing among the mobile terrestrial service and satellite services, especially in the mid-band frequencies below 14 GHz, is often

⁷ See, e.g., ICFS File Nos. SAT-LOA-20230924-00232 & SAT-AMD-20231220-00321; ELS File No. 1607-EX-ST-2023.

⁸ 47 C.F.R. § 2.106 n. US258.

⁹ See Strategy at 7 (“U.S. policy (and stakeholders) must recognize that ‘studying’ a band for potential repurposing to enable more efficient use does not prejudice the outcome of the study (i.e., that all, part, or none of the band ultimately will be repurposed as a result of the study).”)

impossible given the sensitivity of satellite ground station receivers.¹⁰

Standard EESS downlinks use wideband transmissions and low power spectral density that are received by large gateway antennas operating at very low elevation angles. As a result, EESS ground stations are highly sensitive to noise making them particularly vulnerable to interference from high-powered terrestrial mobile operations operating at high duty cycles.¹¹ And while EESS operators often share gateway locations, the growing number of EESS satellite systems and coordination-imposed limitations on bandwidth and downlink availability at the relevant earth stations means that operators and ground station providers are under increasing pressure to expand ground station operations to satisfy demand for X-band data and telemetry downlink capabilities. EESS operators and ground station providers are looking to NTIA and other Federal stakeholders for additional flexibility in the X-band, not new constraints. The introduction of a new, incompatible mobile terrestrial service in the X-band threatens to hinder the rapid growth of EESS in the United States.

Spire agrees with the other X-band companies that NTIA should exclude the X-band from study altogether.¹² However, if the 375 MHz of X-band spectrum is to be made available for consideration as part of the Strategy, Spire strongly encourages NTIA to (i) require proponents of new entry to demonstrate an ability to protect incumbent EESS operations in the band without hindering or otherwise limiting the potential expansion of the service in the band, including the addition of future U.S. non-Federal EESS ground stations, and (ii) permit the active participation of non-Federal incumbent stakeholders in the proceeding. Under no circumstances should it be sufficient for proponents of new entry to merely claim that the spectrum would be ideal for use from a propagation perspective. Rather, proponents should be required to demonstrate necessity, potential for economies of scale, global harmonization, and multi-national standardization, and the ability to operate without causing harmful interference to or impeding the future growth potential of incumbents.¹³ Incumbent operators should be permitted to actively participate in the proceeding to provide additional information, including rebuttals, to ensure that a fulsome, balanced record is created before a decision on repurposing is made.

¹⁰ See generally *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Report and Order and Order of Proposed Modification, GN Docket No. 18-122, 35 FCC Rcd 2343 (2020); *Expanding Flexible Use of the 12.2-12.7 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking and Order, WT Docket No. 20-443, GN Docket No. 22-352, FCC 23-36 (2023) (“12 GHz Order”).

¹¹ See, e.g., Meredith Attwell Baker, *More Licensed Spectrum Is Needed to Drive U.S. Innovation*, CTIA (Dec. 7, 2022), <https://www.ctia.org/news/more-licensed-spectrum-is-needed-to-drive-u-s-innovation> (“[T]hree blocks of lower mid-band spectrum (3.1-3.45, 4.4-4.94, 7.125-8.4 GHz) . . . if allocated to exclusive, licensed commercial use, at full power, could help us meet surging demand and achieve 5G’s full potential[.]”).

¹² See Comments of Ad Hoc X-Band Companies, Federal Register Doc. 2023–26810, at 7 (Jan. 2, 2024).

¹³ See, e.g., 12 GHz Order, ¶ 27 (“We also find that ubiquitous two-way mobile broadband 5G service is likely to create a significant risk of harmful interference. . . . While deployment of NGSO FSS service in the 12.2 GHz band is still developing, terrestrial 5G service in the band is hypothetical.”).

IV. CONCLUSION

Spire commends NTIA's continuing leadership to build a spectrum pipeline through the adoption of the Strategy. Spire encourages NTIA to facilitate the tireless growth and innovation of non-Federal EESS operators as they continue to deliver pioneering Earth observation and space-as-a-service services to Americans by excluding the X-band from study. Spire looks forward to working with NTIA and the Executive Branch on the development of the Implementation Plan and future studies on the efficient use of spectrum.

Respectfully Submitted,

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