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

In the Matter of	)	
	)	
Modernizing Spectrum Sharing for Satellite Broadband	)	SB Docket No. 25-157
	)	
	)	
Revision of the Commission's Rules to Establish More Efficient Spectrum Sharing Between NGSO and GSO Satellite Systems	)	RM-11990 (Terminated)

SUMMARY

Public Knowledge (PK) and New America's Open Technology Institute (OTI) submit these comments in support of the Commission's Notice of Proposed Rulemaking on modernizing the spectrum sharing framework for geostationary (GSO) and non-geostationary (NGSO) fixed-satellite service (FSS) systems operating in the 10.7-12.7, 17.3-18.6, and 19.7-20.2 GHz bands. The existing framework, using outdated Equivalent Power Flux Density (EPFD) limits, does not properly accommodate spectrum sharing between GSO and NGSO systems, and instead favors GSO incumbents over a practical framework that can more fairly balance spectrum sharing between GSO and NGSO FSS systems. As NGSO systems continue to develop, now is the proper time for the Commission to replace the EPFD-limit protection framework with an industry and world leading framework that requires operators to coordinate on a good faith basis, and includes default objective interference thresholds, based on what was adopted last year in the NGSO/NGSO sharing framework for long- and short-term interference, to adequately protect GSO systems from harmful interference if good faith coordination fails. Such a framework will increase satellite broadband network availability, improve service quality, promote competition, and ultimately make satellite broadband more affordable – all objectives the Commission should aim to achieve through this rulemaking.

TABLE OF CONTENTS

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	)	
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COMMENTS OF PUBLIC KNOWLEDGE AND
OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA

I. Introduction

Public Knowledge (PK) and New America's Open Technology Institute (OTI) respectfully submit these comments in response to the Notice of Proposed Rulemaking ("NPRM") seeking comment on the Commission's plan to update the decades-old spectrum sharing regime between geostationary (GSO) and non-geostationary (NGSO) fixed-satellite service (FSS) systems operating in the 10.7-12.7, 17.3-18.6, and 19.7-20.2 GHz bands.[1] Since current equivalent power flux density (EPFD) regulations restrict the spectrum capacity of NGSO satellite systems, and subsequently the availability of satellite broadband, PK and OTI support a review of these antiquated limits. PK and OTI are pleased to see the Commission taking steps to enhance satellite spectrum capacity and service quality. Accordingly, PK and OTI urge the Commission to adopt a NGSO/GSO spectrum sharing and coexistence framework that – much like the NGSO/NGSO sharing framework adopted in 2023 and 2024 – is premised on a good faith coordination requirement among all GSO and NGSO FSS operators, regardless of

[1] Notice of Proposed Rulemaking, SB Docket No. 25-157, RM-11990 (terminated) (rel. April 29, 2025) ("NPRM").

incumbency, and an objective default (safe harbor) interference protection metric as a proxy for actual harmful interference.

II. Commenters Have Long Urged the Commission to Modernize the Satellite Spectrum Sharing Regime

PK and OTI have consistently advocated for policies that support efficient satellite spectrum usage to deliver broad public benefits. In 2022, PK and OTI joined five other public interest organizations in submitting comments urging the Commission to adopt a new, more robust spectrum sharing framework between NGSO operators that encourages market entry and competition.[2] These comments recommended the Commission institute a good faith coordination framework for sharing among all NGSO FSS operators, a degraded throughput metric to establish an actual interference threshold, and a sunset of interference mitigation based on prioritization. Since submitting these comments, PK and OTI have repeatedly emphasized similar recommendations with the goal of increasing the spectrum capacity of NGSO FSS operators.[3] As PK and OTI have explained, increased spectrum capacity for these systems will enable more robust satellite broadband service, promote competition by enabling more market entry, and facilitate innovation to lower costs for consumers and business users alike.[4]

A year later, PK and OTI, joined by 13 other public interest organizations, reiterated this objective in a letter to the leaders of the U.S. delegation at the 2023 World Radio Conference

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[2] Comments of Open Technology Institute at New America, Center for Rural Strategies, Public Knowledge, New Century Cities, Benton Institute For Broadband & Society, Oregon Fiber Partnership, and Access Humboldt, *Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems*, IB Docket No. 21-456 (Mar. 25, 2022).
[3] Letter from Michael Calabrese, Director, Wireless Future Open Technology Institute at New America and Harold Feld, Senior Vice President, Public Knowledge to Marlene Dortch, Secretary, Federal Communications Commission, IB Docket No. 21-456 (Mar. 15, 2023); *See also* Comments of New America's Open Technology Institute and Public Knowledge, *Modernizing and Expanding Access to the 70/80/90 GHz Bands*, WT Docket No. 20-133 (May 29, 2024).
[4] *Id*.

(WRC).[5] The letter urged the delegation to prioritize Low Earth Orbit (LEO) NGSO systems and asked the International Telecommunications Union (ITU) to update the rules governing interference protection and coexistence with GSO systems. As LEO systems depend on shared spectrum, PK and OTI have consistently advocated for changes that facilitate more intensive spectrum sharing and coexistence among operators, while also avoiding truly harmful interference. Most recently, PK and OTI voiced support for the Commission's plan to reevaluate the ITU's outdated and overly restrictive EPFD limits with a focus on enabling more robust satellite spectrum sharing.[6]

III. Commenters Support a Timely Modernization of the Spectrum Sharing Regime

PK and OTI strongly support the establishment of a framework for spectrum sharing and coexistence between GSO and NGSO FSS systems without waiting for the ITU to "study" for the next WRC what is already well-established in the Commission's recent Orders concerning NGSO/NGSO sharing in these same bands. Amid a rapidly evolving marketplace and surging demand for higher-capacity and lower-latency satellite broadband, now is the critical time to act to ensure equitable and efficient spectrum use among all satellite systems. Our groups therefore urge the Commission to move quickly to adopt changes that will facilitate greater connectivity, competition, and affordability in the U.S. satellite marketplace.

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[5] Letter from 15 public interest organizations to FCC Chairwoman Jessica Rosenworcel, Assistant Secretary of Commerce Alan Davidson, and Ambassador at Large Nathan C. Fick, U.S. State Department, urging the U.S. to prioritize more efficient and equitable access to shared spectrum resources for both LEO and GSO networks at WRC'23 (August 28, 2023), available at https://newamericadotorg.s3.amazonaws.com/documents/Sign-On_Letter_re_LEO_Benefits__Coexistence_FINAL_082523.pdf.

[6] Letter from Michael Calabrese, Director, Wireless Future Open Technology Institute at New America and Harold Feld, Senior Vice President, Public Knowledge to Marlene Dortch, Secretary, Federal Communications Commission, SB Docket No. 25-157 (Apr. 21, 2025).

A. The Global Satellite Industry Has Significantly Changed Since EPFD Limits Were Established

Since EPFD limits were established by the ITU in 2000, there has been unprecedented growth in the size and capabilities of LEO satellite broadband networks. The past few years alone have seen new NGSO operators launching thousands of satellites to meet increased global demand for broadband, particularly in rural and other areas where wireline and even fixed wireless broadband are not available. LEO constellations now offer high-speed, low-latency services which are far more capable than previous NGSO systems in connecting people around the world, to the great benefit of rural Americans and American companies.[7] However, despite these advancements, the international regulatory framework, using EPFD limits largely informed by 1990s technology, has not kept pace. As a result, today's emerging NGSO operators must operate under an archaic framework, which dramatically fails to make efficient use of satellite spectrum and fails even the people it serves. The NPRM correctly states that EPFD limits represent the "single most constraining regulatory requirement on NGSO satellite systems."[8]

B. International Rules Are Not Keeping Pace with American Innovation

The ITU's slow pace of reform makes it impractical to modernize the NGSO-GSO spectrum sharing framework through the WRC process within a timeframe that swiftly closes the digital divide and optimizes potential benefits to U.S. consumers. While a review of EPFD limits is being studied, such item was not adopted in the agenda for WRC 2027. This means that the earliest likely opportunity for international reform is the subsequent WRC in 2031.[9] Six years is far too long for American industry and consumers to wait, especially as innovative technology is

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[7] *See Communications Marketplace Report*, GN Docket No. 24-119, FCC 24-136 (Dec. 31, 2024) (2024 Marketplace Report).
[8] NPRM at par. 2.
[9] NPRM at par. 7; *See also* ITU Council, Agenda of the World Radiocommunications Conference 2027 (WRC-27) (May 3, 2024), available at https://www.itu.int/md/S24-CL-C-0064/en.

ready now. The proposed reevaluation of EPFD limits in the GSO-NGSO sharing framework will again secure U.S. leadership in spectrum on a global scale and advance the public interest by making satellite spectrum use more efficient.

Leading the charge in reevaluating EPFD limits wouldn't be the first time the U.S. has diverged from outdated ITU rules. Last year, the Commission adopted a degraded-throughput methodology for NGSO/NGSO sharing that better reflects actual interference impacts between NGSO FSS systems.[10] This policy aligns with the Commission's recent emphasis on assessing actual and harmful interference, and it represents a divergence from longstanding ITU practices based on interference-to-noise ratios.[11] The Commission again has the opportunity to demonstrate that rules innovation produces technical innovation.

IV. The Commission Should Adopt a Good Faith Coordination Framework with Default Thresholds Based on Actual Harmful Interference

The Commission has an opportunity to modernize spectrum sharing by implementing a framework for NGSOs and GSOs that roughly parallels the Commission's recently adopted framework for spectrum sharing and coexistence among NGSO systems.[12] This framework should include, at a minimum, a good faith coordination requirement, default interference thresholds that are a proxy for actual harmful interference, and a 10-year sunset on GSO ground station protections. PK and OTI believe that adoption of such a framework will ensure better communication, and subsequent spectrum utilization, between these two systems.

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[10] *See* Second Report and Order and Order on Reconsideration, *Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems*, IB Docket No. 21-456 (Nov. 15, 2024).

[11] Eric Fruits, *FCC's New Satellite Rules: Sharing Is Caring*, Truth on the Market (Nov. 18, 2024), https://truthonthemarket.com/2024/11/18/fccs-new-satellite-rules-sharing-is-caring/

[12] Report and Order and Further Notice of Proposed Rulemaking, *Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems,* IB Docket No. 21-456 (rel. Apr. 21, 2023).

A. An Operator-To-Operator Good Faith Coordination Requirement Promotes Fairness and Encourages Information Sharing

PK and OTI strongly support the Commission's adoption of a revamped sharing framework that requires good faith coordination efforts among all GSO and NGSO FSS operators regardless of incumbency, ITU status, or processing round. This must include information-sharing requirements to enable and encourage more intensive and efficient band sharing. Any prioritization based on incumbency or orbital status should apply *only* when good faith coordination fails and the NGSO system does not satisfy the objective default (safe harbor) interference protection metrics the Commission adopts as a proxy for actual harmful interference. This creates a default to the current sharing system, which encourages NGSO systems to coordinate and resolve interference conflicts in good faith to avoid rigid prioritization based on incumbency. In contrast, the current rules create a strong incentive for incumbent GSO operators *not* to coordinate in good faith with NGSO systems, which are increasingly competitors. This harms consumers and wastes spectrum.

Incentivizing spectrum sharing helps to boost competition, which benefits consumers by catalyzing innovation, improving affordability, and contributing to a vibrant and diverse wireless ecosystem. Accordingly, the Commission should also make every effort to facilitate good faith coordination by ensuring adequate technical information is available, while also protecting proprietary or competitively-sensitive information from undue disclosure or misuse.

In this respect the PK and OTI fully agree with House Energy & Commerce Chairman Brett Guthrie (R-KY) and Rep. Doris Matsui (D-CA) who, as co-chairs of the Congressional Spectrum Caucus, stated in a 2022 letter to the Commission: "Good faith coordination should include meaningful, continuous, and flexible requirements to ensure the appropriate flow of technical information needed to achieve cooperation, and apply them among all NGSO FSS

grantees, including those authorized through different processing rounds."[13] As a Dynamic Spectrum Alliance (DSA) report similarly noted, "complete and accurate licensing information on incumbent operations" are an "essential component of any coordination process" coupled with updates that are sufficiently often that they "capture new licensees or changed operating parameters."[14] PK and OTI likewise agree with Kuiper's observation at the outset of the NGSO sharing proceeding that the "NGSO FSS environment is continuously changing and evolving . . .. Without an ongoing exchange of information, operators would not have the information required to best mitigate interference."[15]

PK and OTI believe that maintaining any prioritized interference protection for earlier-approved GSO systems makes it more important that the Commission does everything in its power to facilitate a positive outcome to good faith coordination and defaults based on metrics that approximate actual harmful interference, while also ensuring that incumbent GSO systems have an adequate sunset period and the time to appropriately modify their systems for more-efficient coordination. Getting this balance right is not only essential to optimizing the public interest use of these shared bands, but can also build on the Commission's forward-thinking and world-leading efforts to promote spectrum sharing including, when necessary, reliance on spectrum database management technologies.

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[13] Letter of Reps. Doris Matsui and Brett Guthrie to Federal Communications Commission Chairwoman Jessica Rosenworcel (March 14, 2022), available at https://matsui.house.gov/sites/evo-subsites/matsui.house.gov/files/evo-media-document/20220314%20-%20Satellite%20nprm.pdf.

[14] Dynamic Spectrum Alliance, *Automated Frequency Coordination: An Established Tool for Modern Spectrum Management*, at 13 (March 2019), available at http://dynamicspectrumalliance.org/wp-content/uploads/2019/03/DSA_DB-Report_Final_03122019.pdf.

[15] Comments of Kuiper Systems LLC, RM-11855, at (June 15, 2020).

B. The Commission Should Adopt Spectrum-Efficient Defaults and Align Incentives for Coordination Agreements

PK and OTI urge the Commission to adopt objective interference thresholds based on proxies for actual harmful interference that would adequately protect GSO systems from harmful interference in bands shared with NGSO systems. Where good faith coordination fails, these harmful interference thresholds should serve as safe harbors that determine the avoidance angles and power levels that define the ability of NGSO systems to operate with a presumption of no undue interference to GSO incumbents. We believe the same 3 percent degraded throughput threshold adopted last year to promote robust coexistence in the NGSO/NGSO context should be considered as the long-term interference protection level. As a threshold for short-term GSO interference protection, we believe both an avoidance angle of 4-to-6 percent should be considered as well as, in the alternative, a measure of the absolute increase in unavailability, such as the 0.4 percent adopted for NGSO/NGSO sharing.

Our groups believe that limitations on spectrum sharing and use should be based on the *actual* degradation of service that a system could reasonably expect to experience, and not on an arbitrary or overly-conservative EPFD limit. As the Commission has made clear in recent proceedings, operators authorized to share a band with a priority licensee should be required to mitigate interference *only* to the extent that it results in actual and significant harmful impact on service. While the precise thresholds should be derived from technical data submitted into the record, we generally encourage the Commission to adopt metrics that will optimize the performance of both NGSO and GSO systems, while also reserving the ability to revisit and amend these thresholds based on actual experience going forward. To the extent that GSOs or any other satellite system receives prioritized protection, degradation of service is the best proxy

for harmful interference. It also better aligns incentives to encourage voluntary coordination agreements and, ultimately, is most likely to result in the most efficient use of available capacity.

The Commission's Technological Advisory Council (TAC) explained this in its 2017 report on NGSO-to-NGSO interference and endorsed degraded throughput as an interference criteria for NGSO satellite systems.[16] The TAC report stated that "spectrum management often focuses on eliminating or providing predictable bounds on the amount of potential degradation. . . . When the gap is small, the efficiency penalty associated with focusing on potential degradation is also small."[17] The report noted, however, that "[i]n the case of coexisting NGSO satellite constellations, the gap between the potential level of degradation and the amount of harmful degradation is large." That is, when the gap is large, so is the "efficiency penalty."[18]

Adopting a degraded throughput metric would also be consistent with recommendations of the United States at the ITU for a "single-entry metric of a 3% increase in unavailability and a 3% allowance in the reduction of the time-averaged weighted in degraded throughput, and that some evidence supports this as a reasonable value."[19]

V. A New Sharing Regime Will Maximize Efficiency In NGSO Systems, Ensuring Affordable Broadband and Greater Connectivity

Instituting a new spectrum sharing regime, particularly by replacing the ITU's antiquated threshold based on EPFD with metrics that serve as measures of actual harmful interference, will help the Commission to achieve its key spectrum policy objectives of efficient utilization, digital

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[16] *See* FCC Technological Advisory Council, Satellite Communication Plan Working Group, *A Risk Assessment Framework for NGSO-NGSO Interference*, at 23, 27-31 (2017), available at https://transition.fcc.gov/oet/tac/tacdocs/meeting12617/TAC-NGSO-risk-assessment-framework-v100-2017-12-06.pdf.

[17] *Id*. at 26.

[18] *Id*. at 26-27.

[19] *See Updates to Working Document Towards a Preliminary Draft New Recommendation ITU-R S.[Interference-NGSO]*, Contribution to WP 4A from the United States of America, Document 4A/420-E, at 3 (Oct. 18, 2021).

equity, and U.S. leadership and innovation.[20] Importantly, the Commission can do so while protecting incumbent services and the customers who rely on these services. To satisfy the demand for high-quality broadband everywhere and for all, the Commission has stated that it "must find ways to prompt more intensive use of spectrum while ensuring coexistence among both new and existing services."[21]

A clear path forward is to focus on maximizing the efficient and intensive use of satellite spectrum, which is inherently shared. PK and OTI view "efficiency" in a new sharing regime as a framework that prompts bandwidth abundance, which in turn leads to more competition, higher service quality, and lower prices that ultimately work to benefit American consumers.[22] To achieve this objective, incentivizing good faith coordination between NGSO and GSO systems is crucial. Consistent with the U.S. delegation's position at WRC-23,[23] proper coordination between these systems mitigates interference levels and drives connectivity. And where coordination does not occur, default limits on NGSO power and spectrum access should be premised to the greatest degree feasible on measures of actual harmful interference, such as degraded throughput.

Efficient spectrum usage removes barriers to market entry, meaning more LEO satellites can be deployed, increasing capacity and the ability to deliver a higher quality of service to consumers. This enhances the overall availability of satellite services and makes greater competition possible. Consequently, this allows for equitable access to digital services that will

[20] *See* Policy Statement, *In the Matter of Principles for Promoting Efficient Use of Spectrum and Opportunities for New Services*, ET Docket No. 23-122 (Apr. 21, 2023).
[21] *Id.* at par. 6.
[22] *See* Harold Furchtgott-Roth, "The Economic Benefits of Updating Regulations that Unnecessarily Limit Non-Geostationary Satellite Orbit Systems" (August 2023), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4538619.
[23] *See* Media Note, U.S. Department of State Leads Successful U.S. Delegation to World Radiocommunication Conference in Dubai (Dec. 15, 2023), available at https://2021-2025.state.gov/u-s-department-of-state-leads-successful-u-s-delegation-to-world-radiocommunication-conference-in-dubai/#:~:text=U.S.%20companies%20are%20leading%20developers,by%20millions%20of%20people%20worldwide.

help to bridge the digital divide between those with and without broadband access.[24] Going hand-in-hand with the public interest is the Commission's opportunity to stimulate innovation. Since abundant bandwidth allows for new market entrants, small NGSO companies will have the means to develop and deploy new technologies. This, in turn, would allow the U.S. to remain a global leader in satellite technology while delivering significant economic benefits. Altogether, driving NGSO efficiency through bandwidth abundance creates a win-win for both American industry and the public.

VI. Conclusion

A core function of the Federal Communications Commission is to allocate spectrum so as to serve the "public interest."[25] To that end, it is vital that the Commission works to ensure every community has access to affordable, reliable broadband. A robust satellite spectrum sharing regime will help to establish the U.S. as a global frontrunner in expanding spectrum access while also fulfilling the Commission's obligation to optimize connectivity and competition to benefit the American public. PK and OTI believe that the adoption of a new regime, including good faith coordination and spectrum-efficient defaults, will promote the public interest by increasing network availability, service quality, and ultimately affordability. PK and OTI therefore urge the Commission to promptly revise the current regime and demonstrate that U.S. leadership in spectrum policy is rooted in serving the needs of the people.

Respectfully submitted,

/s/ Harold Feld
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/s/ Michael Calabrese
Director, Wireless Future

[24] *See* Congressional Report, *Low Earth Orbit Satellites: Potential to Address the Broadband Digital Divide* (Aug. 31, 2021), available at https://www.congress.gov/crs-product/R46896.
[25] 47 U.S.C. § 303(y)(2)(a).

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