

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

In the Matter of)	
)	
Expanding Flexible Use of the)	
12.2-12.7 GHz Band)	WT Docket No. 20-443
)	
To: The Commission)	

COMMENTS OF TECHFREEDOM

TechFreedom hereby files these Comments in response to the Notice of Proposed Rulemaking (“12 GHz NPRM”), adopted January 12, 2021 and released January 15, 2021.¹ The NPRM posed a number of questions related to the 12 GHz spectrum (12.2-12.7 GHz), and whether it can be reallocated for terrestrial use without imposing harmful interference to incumbent users. In support of these Comments, TechFreedom submits:

1. About TechFreedom

TechFreedom is a non-profit 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. Wherever possible, we seek to empower users to make their own choices online and elsewhere.

TechFreedom and undersigned counsel have a long history advocating for innovative uses of outer space.² The instant NPRM sits at the intersection of spectrum

¹ The NPRM was published in the Federal Register on March 8, 2021. 86 Fed. Reg. 13226 (March 8, 2021) [hereinafter 12 GHz NPRM]. The Federal Register Notice set the comment date as April 7, 2021, and reply comment date of May 7, 2021. By Order, DA 21-370 (March 29, 2021), the Wireless Telecommunications Bureau (WTB) extended the comment date to May 7, 2021, and the reply comment date to June 7, 2021. These comments are timely filed.

² See, e.g., *Reopening the American Frontier: Exploring How the Outer Space Treaty Will Impact American Commerce and Settlement in Space: Before the Senate Committee on Commerce, Science, & Transportation Subcommittee on Space, Science, and Competitiveness*, 115th Cong. (2017) (written testimony of James E. Dunstan & Berin Szoka), available at <https://www.commerce.senate.gov/services/files/A9AD88B2-9636-4291-A5B0-38BC0FF6DA90>, video of hearing available at <https://www.commerce.senate.gov/2017/5/reopening-the-american-frontier-exploring-how-the-outer-space-treaty-will-impact-american-commerce-and-settlement-in-space>; *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-sogiant-a-leap-for-space-law/>; *Revived National Space Council Could Mean*

policy and space law, a place we've inhabited for decades. We are uniquely suited to provide commentary on the NPRM. We previously file comments addressing the underlying Petition for Rulemaking which prompted the current NPRM.³

2. The Commission Should Have Issued a Notice of Inquiry (NOI), not a Notice of Proposed Rulemaking (NPRM)

As our comments regarding the MVDDS Petition indicated, the Commission should have merely denied the petition, given the facial impossibility of harmonizing the requested spectrum allocations.⁴ But having decided to vote out an item prior to the change-over in administrations, the Commission should have issued a Notice of Inquiry. The instant NPRM has all the hallmarks of an NOI, not an NPRM. The *12 GHz NPRM* asks more than 120 questions, yet does not set forth any actual *rules* on which comments are sought. Because many of these questions involve critical engineering analysis,⁵ as well as

Space Policy Rethink, TechFreedom (July 7, 2017), <https://techfreedom.org/revived-national-spacecouncil-mean-space-policy-rethink/>; J. Dunstan, "Space Trash: Lessons Learned (and Ignored) from Space Law and Government," 39 J. OF SPACE L. 23 (2013).

³ See *Ex Parte* Comments of TechFreedom, filed in response to RM-11768, on 9.

⁴ *Id.*

⁵ See, e.g., *12 GHz NPRM*, *supra* note 1, ¶ 22 ("For example, assuming existing MVDDS service rules as the baseline, should we eliminate or modify the EIRP restriction for terrestrial operators of 14.0 dBm per 24 megahertz (-16.0 dBW per 24 megahertz?"); *id.* ¶ 23 ("How could other factors—such as geographic separation, transmitter power constraints on terrestrial operations, and other siting parameters for flexible-use base stations—minimize the risk of interference to DBS users?"); *id.* ¶ 25 ("The MVDDS 5G Coalition also suggests that keeping terrestrial signals below the applicable EPFD limit at all DBS antenna locations generally could avoid harmful interference to existing DBS subscribers regardless of the EIRP or whether the operations are fixed or mobile, or one- or two-way. Do commenters agree? . . . Can cell-site EIRP or location be engineered to mitigate any potential interference? What are appropriate EIRP considerations for base and mobile stations?"); *id.* ¶ 26 ("AT&T contends that enabling two-way, mobile use— which would include transient signals from unpredictable locations and angles—would make it impossible to model and avoid interference to DBS receivers, and that it would be "exceptionally difficult for the DBS operator to trace or identify" the cause of interference as the signal moved. We seek comment on this view."); *id.* ¶¶ 27-28 ("DISH asserts that, at some level of concentration,

policy decisions, it is simply impossible for commenters to provide the analysis necessary to move from here to actual rules.

TechFreedom has long urged the FCC not to issue an NPRM when it was just at the “asking questions” stage in a proceeding.⁶ This is simply the latest example of the Commission using NPRMs when it should be using NOIs. Whatever discretion the Commission enjoys under the Administrative Procedure Act⁷ to configure its rulemaking process, this pattern denies regulated parties adequate opportunity to shape the FCC’s proposal, insofar as the FCC merges analysis of basic legal questions with analysis of highly technical, yet unarticulated, rules into a single round of comments. Once the NPRM is issued, the gun is loaded, and the Commission may fire at any time. Ready, fire, aim!⁸

Former Commissioner Pai (whose FCC voted out the instant NPRM) wrote about the wisdom of conducting an NOI before an NPRM:

large numbers of NGSO FSS satellites could operate for interference purposes like fixed DBS licensees, because the receiving earth stations would be directed at a limited number of proximate points in low-Earth orbit instead of at a nearly limitless array of different points throughout the sky. We seek comment on the technical analyses submitted to date, as well as further information and studies related to the feasibility, costs, and benefits of sharing among these services.”).

⁶ See TechFreedom and the International Center for Law & Economics, Reply Comments on Modernizing the E-rate Program for Schools and Libraries (Nov. 7, 2013), WC Docket No. 13-184, n. 8, available at http://docs.techfreedom.org/E_Rate_Reply_Comments.pdf#page=4 (“the FCC should have issued a Notice of Inquiry before issuing this NPRM for precisely this reason — a mistake the FCC all too often makes, frequently putting the Commission in the awkward position of being on the verge of rulemaking without first properly exploring the facts on the ground. This is the worst kind of putting the cart before the horse.”).

⁷ Pub. L. No. 79-404, 60 Stat. 237 (1946) (codified as amended at 5 U.S.C. § 551 et seq.).

⁸ See also *FCC Violates Basic Legal Principles in Rush to Regulate Set-Top Boxes*, TECHFREEDOM (Feb. 18, 2016), available at <http://goo.gl/0aQMqc> (“This is simply the latest example of the FCC abusing the rulemaking process by bypassing the Notice of Inquiry... Every time the FCC does this, it means the gun is already loaded, and ‘fact-finding’ is a mere formality.”).

We simply ask a lot of questions about where things stand, which is typically what we would do in a Notice of Inquiry. While I of course support soliciting comment as we begin this journey, I think the better approach here would have been to ask for input on where we intend to go. The public is better served if attention can be focused on proposed rules, and the FCC's ultimate decisions are better informed by direct, as opposed to general, public engagement."⁹

Acting Chairwoman Rosenworcel had similar sentiments regarding the NPRM that ultimately lead to the 2015 Open Internet Order.¹⁰ "I would have done this differently. Before proceeding, I would have taken the time to understand the future[,]” and “taken time for more input.”¹¹ For the same reasons, the FCC Process Reform Act, passed by the House in the 113th Congress, would generally require the FCC to issue a Notice of Inquiry prior to conducting a rulemaking.¹² Especially where most of the proposed solutions contained in the *12 GHz NPRM* involve complex spectrum sharing arrangements, the sharing rules must be available for full review and comment prior to adoption.¹³

Moving directly to an NPRM is doubly troublesome here, where it appears that at least one party, RS Access, LLC (RS Access), is holding *ex parte* meetings with several Commissioners, providing detailed engineering studies that “focus on finding ‘win-win’

⁹ Policies Regarding Mobile Spectrum Holdings, WT Docket No. 12-269 (Statement of Chairman Pai).

¹⁰ Open Internet Order, 30 FCC Rcd 5601 (7) (2015).

¹¹ Protecting and Promoting the Open Internet, Notice of Proposed Rulemaking, GN Docket No. 14-28, at 92 (May 15, 2014), available at <https://goo.gl/FlowH0>. (Commissioner Rosenworcel, concurring).

¹² See Federal Communications Commission Process Reform Act of 2013, H.R. __, 113th Cong. § 13(a)(1)(A)(i)(I), available at <http://docs.house.gov/meetings/IF/IF16/20130724/101215/BILLS-113pih-FCCProcessReform.pdf>.

¹³ As much as TechFreedom applauds the FCC for publicly circulating drafts of items prior to adoption (and hopes that the current FCC will continue the tradition established by the prior FCC), providing a copy of rules less than 30 days prior to adoption cannot be deemed proper notice and comment under the APA.

solutions that will protect existing services while also accommodating rules changes to allow the 500 megahertz in the MVDDS band to be used to support mobile 5G service,” without filing those studies in the record.¹⁴ Discussing such studies with Commissioners or Commission staff in the context of a general inquiry, where the FCC is in fact-finding mode, is one thing. Discussing studies that could establish the “rules of the road” for such a significant rule change in an NPRM, where the Commission may be moving toward formulating actual rules, is completely inappropriate. Have we returned to the days where industry insiders are allowed to cut deals with the Commission without anyone getting the chance to comment? If the FCC had issued the instant item as an NOI, where it would be impossible to move directly to rules, this wouldn’t have been a problem. To rectify the current situation, the FCC should rescind the current NPRM and re-issue it as an NOI.¹⁵

3. Yes, 5G is Important, but No, Not Every Spectrum Decision Must Result in More Spectrum for 5G

“5G,” in many ways, has become the catch-phrase of the decade, much the way “dot-com” was the buzzword of the 1990s, when any business with a “.com” appended to its name seemingly could raise billions in investment dollars without any real products or business models.¹⁶ Mention “5G” today and heads turn. If you’re *for* 5G, in any form, you

¹⁴ See RS Access *ex parte* notice of April, 28, 2021.

¹⁵ If the Commission fails to take this course, then any order in this proceeding must address the issue of *ex parte* violations by RS Access for failing to file the substance of any communications with Commission staff. 47 C.F.R. § 1.1206(b)(1) (an *ex parte* notification needs to “summarize[] all data presented and arguments made during the oral *ex parte* presentation. Memoranda must contain a summary of the substance of the *ex parte* presentation and not merely a listing of the subjects discussed. More than a one or two sentence description of the views and arguments presented is generally required.”). The RS Access April 28, 2021 *ex parte* notice certainly fails to meet this requirement.

¹⁶ See, e.g., Kalen Smith, *History of the Dot-Com Bubble Burst and How to Avoid Another*, MONEY CRASHERS, <https://www.moneycrashers.com/dot-com-bubble-burst/> (last visited

wear the white hat. Object to anything related to “5G,” and you’re downright un-American. Life, as usual, is far less simple. When it comes to spectrum policy, almost by definition, there will be “winners” and there will be “losers.” Just by appending “5G” to your name doesn’t mean you get to be on the winning side in all spectrum battles.

5G (or “fifth generation”) is the next step in improving the throughput in the nation’s terrestrial communications infrastructure. Like its predecessor protocols, 5G is a standard for cellular wireless networks. It, in itself, is not frequency-dependent, although, to increase speeds, it is best deployed in higher frequency bands. The FCC has made 5G a priority. “Forward-thinking spectrum policy, modern infrastructure policy, and market-based network regulation form the heart of our strategy for realizing the promise of the 5G future.”¹⁷ The *12 GHz NPRM* points out all the ways the FCC has attempted to accommodate users wishing to deploy 5G systems.¹⁸

Oct. 8, 2020) (“During the late 20th century, the Internet created a euphoric attitude toward business and inspired many hopes for the future of online commerce. For this reason, many Internet companies (known as ‘dot-coms’) were launched, and investors assumed that a company that operated online was going to be worth millions.”); The Plain Bagel, *The Dot-Com Bubble – 5 Minute History Lesson*, YOUTUBE (Feb. 7, 2020), https://www.youtube.com/watch?v=25_WjiZnvQk.

¹⁷ Nadya Joubert, *The FCC’s 5G FAST Plan*, MANAGEMENT SERVICES LLC (June 11, 2019), <https://www.fcc.gov/5G> (quoting former FCC Chairman Pai).

¹⁸ *12 GHz NPRM*, *supra* note 1, ¶ 14 (“In the intervening four years, the Commission has taken action to make additional spectrum available for 5G services. In 2020, the Commission initiated a proceeding to consider rule changes to allow the provision of 5G backhaul and broadband to ships and aircraft in motion in the 70/80/90 GHz bands. Additionally in 2020, the Commission took action to make available 280 megahertz of 3.7-4.2 GHz band spectrum while relocating existing satellite operations to the upper part of the band. Also in 2020 the Commission modernized certain rules governing the 800 MHz³⁶ and took action to expand unlicensed broadband opportunities in the 6 GHz band. In 2019 the Commission completed Auction 101, licensing 850 megahertz of spectrum for flexible use in the 28 GHz band. In Auction 102, the Commission licensed 700 megahertz of spectrum for flexible use in the 24 GHz band. In Auction 103 the Commission licensed 3,400 megahertz of spectrum for flexible use in the upper 37 GHz band, the 39 GHz band, and the 47 GHz band. Also in 2019, the Commission proposed to reconfigure the 900 MHz band to facilitate the

But that should not mean that every time someone asks for more spectrum to deploy 5G systems, the FCC should genuflect and pull that spectrum from other uses. There is a reason why we have a Table of Allocations in Part 2 of the FCC's rules,¹⁹ and there is a reason why the FCC in originally establishing the Table of Allocations set aside some frequencies for future uses, to ensure that with the inevitable march of technology, there would be spectrum available for future uses, some completely unimaginable then, and even today. In the rush to embrace the newest communications protocol, it seems, however, that 5G is *it*. It is the end of technology, it is, and will be forever, the highest and best use of spectrum. That is woefully short-sighted. We must not forget the "Negroponte Switch," that posits that we have the current communications delivery methods we have not due to some fundamental law of physics, but rather by the "accidents of engineering history."²⁰ Engineering changes, history changes, and we can't afford to go "all in" on 5G if it means robbing all other users of spectrum.

4. Satellite Systems Play an Integral Part in Closing the Digital Divide and "The Last Rural Mile"

Think of communications infrastructure much like road systems, and take the example of I-66 moving west out of Washington D.C. At any given time travelling through Fairfax and then Fauquier Counties on I-66, you will find construction. The road gets wider

development of broadband technologies and services. The Commission has also taken steps to provide new opportunities for innovators and experimenters between 95 GHz and 3 THz. In 2018, the Commission proposed providing greater flexibility to current EBS licensees and new opportunities to obtain unused spectrum in the 2.5 GHz band and changed the rules governing Priority Access Licenses (PALs) to spur 5G investment and deployment in the 3.5 GHz band. In 2017, the Commission completed Auction 1002, licensing 70 megahertz of spectrum for flexible use in the 600 MHz band.").

¹⁹ 47 C.F.R. Part 2.

²⁰ See, N. NEGROPONTE, *BEING DIGITAL* (1996).

and wider to accommodate more traffic. Once you hit I-81, however, if you wish to continue travelling directly west into West Virginia, you are dumped onto a two lane road. Many places in West Virginia are accessible only by two lane roads, dirt roads, and ultimately two patches of dirt where tire treads have worn away the grass.

It is the same with terrestrial communications infrastructure. We layer on more and more “lanes” in urban and suburban areas, and 5G is great for that, regardless of the frequencies used. Get further into rural America, however, and 5G is only good when combined with mid-band and low-band frequencies, capable of transmitting out many miles. Given the limited range of 5G antennas, it’s a pipe dream to hypothesize that high-band 5G, such as proposed by many involved in this proceeding, is going to make it out to all those dirt roads and paths. There have already been significant questions asked as to whether winners in the Rural Digital Opportunity Fund (RDOF) auction proposing terrestrial systems will be able to build out to all the areas “won.”²¹ Similarly, DISH has already received one extension from the FCC to meet its build-out requirements for the terrestrial spectrum it won at auction, and it appears that it may need additional time to deploy, undercutting its claim that a spectrum allocation for mobile MVDDS can lead to rapid deployment of more 5G to rural areas.²²

²¹ See Mike Dano, *RDOF auction results already raising questions*, LightReading (Dec. 11, 2020), <https://www.lightreading.com/opticalip/rdof-auction-results-already-raising-questions/d/d-id/766083> (“the FCC may be forced to backtrack if RDOF winners can't sufficiently explain how they will build telecom networks in rural areas with the money they won through the RDOF auction.”).

²² See Motley Fool Transcribers, *DISH Network Corp (DISH) Q1 2021 Earnings Call Transcript*, THE MOTLEY FOOL (Apr. 29, 2021), <https://www.fool.com/earnings/call-transcripts/2021/04/29/dish-network-corp-dish-q1-2021-earnings-call-trans/> (discussing supply chain problems delaying DISH’s 5G deployment).

Meanwhile, the FCC has fully recognized the vital role satellite systems have in reaching that “last rural mile.” This past April, in his statement accompanying the *Report and Order and Further Notice of Proposed Rulemaking on Mitigation of Orbital Debris*, then-Chairman Pai said this:

Today, our nation’s commercial space sector is growing rapidly. And at the FCC, we have been working hard to help our industry seize the opportunities of the new space age. Because satellites have become smaller and we now have more agile, reusable launch vehicles, we can send large numbers of satellites into low- or mid-Earth orbit. These non-geostationary satellite orbit, or NGSO, constellations could be a game changer, benefiting Americans across the country and making high-speed Internet access a reality for more consumers—particularly those in remote and hard-to-serve areas. That’s why, under my leadership, the Commission has approved 14 applications and market access requests by 11 companies for NGSO systems. Our action in this area fits well with the FCC’s twin goals of closing the digital divide and promoting innovation.²³

In his blog announcing the *Mitigation of Orbital Debris* order, then-Chairman Pai was even more focused on the critical role satellite systems will have in closing the “Digital Divide.”

Another huge new opportunity to close the digital divide in rural America comes from major advances in satellite-delivered broadband. The Commission is moving forward with two important initiatives to unlock the potential of this technology. Here’s the context. Instead of sending one large satellite into a high orbit, we can now send a whole bunch of them into low- or mid-Earth orbit. These non-geostationary satellite orbit, or NGSO, constellations will create a mesh network of satellites in space that hold the potential to provide consumer-focused residential broadband at a speed and price-point that is competitive with terrestrial broadband offerings.²⁴

²³ *Mitigation of Orbital Debris in the New Space Age*, Report and Order and Further Notice of Proposed Rulemaking, FCC 20-54, released April 24, 2020 (Chairman Pai statement).

²⁴ Ajit Pai, *Digging in for the Long Haul*, FCC (Apr. 1, 2020), <https://www.fcc.gov/news-events/blog/2020/04/01/digging-long-haul>.

But such innovative NGSO systems cannot operate without spectrum, or more particularly here, can't work if the spectrum assigned to them is laden with interference from other users.

5. The FCC Must Not “Eat the Seed Corn” of Satellite Spectrum to Feed the Hungry 5G Beast

Looking to reallocate space spectrum for terrestrial uses is nothing new. Space users have seen this happen time and again over the past few decades, always with the refrain that the spectrum can be put to higher use immediately, or more money received in auction, if it is repurposed for terrestrial purposes.²⁵ The undersigned author wrote about this more than 20 years ago, when NTIA handed over 15 MHz of spectrum from NASA's Deep Space Network (DSN) as well as frequencies used for flight test and vehicle launch range safety to create the Wireless Communications Service, complete with an outright rejection of International Footnote S5.394 to Part 2, calling for aeronautical telemetry to have priority over other users in the band.²⁶ As we said then:

In one swoop, therefore, the FCC potentially has crippled the Deep Space Network and put rocket launches at risk. How can the space community use these frequencies when they don't even know what uses will be made of these frequencies by the new WCS users, or their technical parameters, or even the power used by WCS operators? While no one can say that WCS will preclude use of these frequencies for their traditional space uses, the next vehicle

²⁵ See, e.g., NASA, SPECTRUM 101: AN INTRODUCTION TO NATIONAL AERONAUTICS AND SPACE ADMINISTRATION SPECTRUM MANAGEMENT at 39-40 (Feb. 2016), available at https://www.nasa.gov/sites/default/files/atoms/files/spectrum_101.pdf (discussing various frequency bands that have been reallocated requiring NASA users to relocate).

²⁶ See J. Dunstan, “Earth to Space: I can't Hear You – Selling Off Our Future to the Highest Bidder,” Space Manufacturing 11, *The Challenge of Space: Past & Future*, Proceedings of the Thirteenth SSI/Princeton Conference on Space Manufacturing, 1997, pp. 247-253; reprint available at <https://techfreedom.org/wp-content/uploads/2020/10/SSI-1997-Earth-to-Space-I-cant-Hear-You.pdf>.

launch using the 2345-2360 band better hope no one decides to order a pizza 60 seconds into the flight.²⁷

The argument for protecting space spectrum, for not eating our “seed corn,” is even more compelling today, when several companies are investing billions of dollars in building and now flying mega constellations of NGSO satellites that at last promise to provide high speed, and more critically, low latency, broadband to every corner of the planet. While these systems have been mired in science fiction fantasies for decades, today they are real, and are being deployed as the current debate plays out.²⁸

The evidence is clear from the comments filed in response to the original MVDDS Petition that reallocating the 12 GHz spectrum for 5G terrestrial uses will wreak havoc on NGSO FSS operations, the exact operations the FCC is banking on to deliver broadband to the “last rural mile.”²⁹ MVDDS Coalition members have admitted as much. “For each of the three scenarios studied, we concluded that while coexistence between DBS and 5G MVDDS would prove feasible within limits, coexistence between NGSO FSS and 5G MVDDS would

²⁷ *Id.* at 252.

²⁸ Just this week, Starlink launched its latest 60 satellites, bringing its constellation to almost 1500 satellites. See Jeff Foust, *SpaceX continues Starlink deployment with latest launch*, SPACENEWS (May 4, 2021), <https://spacenews.com/spacex-continues-starlink-deployment-with-latest-launch/>. And of course, SpaceX keeps its costs low by landing its first stage boosters and reusing them, something that truly was science fiction just a few years ago. See Attila Károly Nagy, *The Sky Calls (1959 Soviet Sci Fi Movie) rocket landing scene*, YouTube (May, 2017), <https://www.youtube.com/watch?v=TdSxDNnqRlo> (landing scene from Soviet 1959 science fiction movie “The Sky Calls”). SpaceX says that it will start beta service in the very near future. Liam Tung, *Elon Musk: SpaceX's Starlink broadband public beta ready to go after latest launch*, ZDNET (Oct. 7, 2020), <https://www.zdnet.com/article/elon-musk-spacexs-starlink-broadband-public-beta-ready-to-go-after-latest-launch/>.

²⁹ See, e.g., Letter from SpaceX to Marlene H. Dortch (July 10, 2020), available at [https://ecfsapi.fcc.gov/file/10710106168381/SpaceX%20Response%20to%20RS%20Access%20\(7-10-2020\).pdf](https://ecfsapi.fcc.gov/file/10710106168381/SpaceX%20Response%20to%20RS%20Access%20(7-10-2020).pdf) (responding to the ex parte submission of RS Access).

not prove feasible, without substantial constraints on one or both services.”³⁰ While the MVDDS Coalition has tried to hone its message in its most recent filings, the best it can say about the impact of 5G deployment on NGSO FSS service is that:

Sharing between satellite and terrestrial broadband is possible through technical innovation as well. Even if sharing were impossible, satellite broadband operators separately have as much as 16.6 gigahertz of spectrum outside of the 12.2-12.7 GHz band available for their use.³¹

Such a “let them eat cake,” or “you’re smart, you figure it out” approach to spectrum management constitutes bad spectrum policy.

6. The 12 GHz NPRM Ignores the Fundamental Incompatibility of NGSO Operations and Mobile 5G Uses of the Same Spectrum

Try as it might to suggest ways in which Mobile 5G and NGSO broadband operations can coexist in the 12 GHz band, fundamentally, the two operations are incompatible. At one point, the Commission admits this. “In conjunction with its Petition, the Coalition provided two Coexistence Studies that it claimed illustrate that the new rules it was proposing would protect DBS operators in the band ***but that they would be incompatible with NGSO FSS.***”³²

The closest the NPRM can come to concluding that the two services are compatible is reiterating a simply bizarre claim by DISH that “NGSO FSS constellations possess geostationary-like functions and properties that could prove more compatible with 5G services in the 12 GHz Band than the last-generation NGSO earth stations.”³³ The *12 GHz NPRM* further amplifies this statement:

³⁰ Reply Comments of MVDDS 5G Coalition, RM-11768, Appendix A at 1 (June 23, 2016).

³¹ RS Access ex parte presentation, filed in RM-11768 on July 2, 2020, p. 4.

³² 12 GHz NPRM, *supra* note 1, ¶ 13 (emphasis added).

³³ *Id.* ¶ 18.

DISH asserts that technological developments in the satellite industry may have increased the degree to which NGSO FSS constellations and flexible use, including two-way mobile service, may coexist. Specifically, DISH maintains that current-generation NGSO FSS constellations possess geostationary-like functions and properties that could prove more compatible with flexible use than last generation NGSO earth stations. ***DISH asserts that to the extent NGSO FSS satellites maintain a highly elliptical orbit and time their active operations to align with the perigee of their orbit in a manner intended to simulate the operation of a GSO system***, such operations presumably would be in a better position to coexist with flexible use operations than a standard NGSO FSS system. DISH further contends that, given the large number of satellites contemplated by these systems, an NGSO FSS antenna should be expected to operate with a much narrower field of view as opposed to one encompassing all realistic azimuths and elevation angles. ³⁴

Let that proposal sink
in for a moment. DISH wants
the FCC to order NGSO
constellations, currently
constrained to limited LEO
orbital bands, to throw

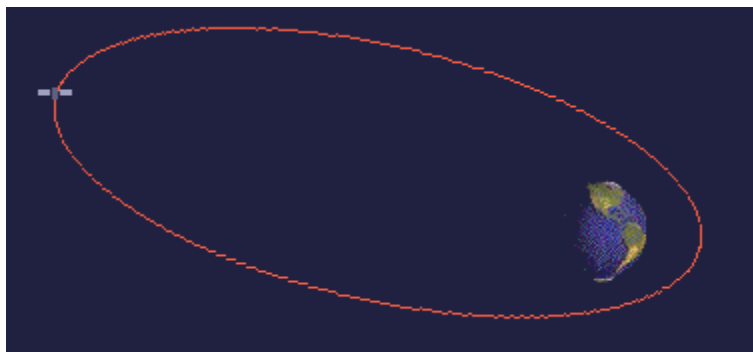


Figure 1 Source:
[Satellites.spacesim.org/english/anatomy/orbit/elliptical.html](https://satellites.spacesim.org/english/anatomy/orbit/elliptical.html)

themselves into highly elliptical (Molniya) orbits. That would mean that Starlink’s 4908 authorized satellites would traverse every other orbital band every orbit.³⁵ From an orbital debris standpoint, that proposal is a complete and total non-starter. The fact that it

³⁴ *Id.* ¶ 28 (emphasis added, footnotes omitted).

³⁵ Placing NGSO satellites into a Molniya orbit would require them to traverse through the Van Allen radiation belts each and every orbit. See *Radiation Belts -- Fun Facts*, NASA (last visited May 6, 2021), https://www.nasa.gov/mission_pages/rbsp/mission_fun-facts.html (“The most intense area of radiation within the outer belt is between about 9,000-12,000 miles above Earth’s surface”). NGSO satellites are not designed to operate in this high radiation regime. Designing satellites to operate in this environment would significantly add to the cost of each satellite. Spread across the thousands of satellites necessary for ubiquitous Earth coverage, the cost increase to “rad harden” NGSO satellites would make such systems economically unviable – which evidently is DISH’s real goal in suggesting this “fix.”

even made it into the NPRM is jaw-dropping. The last part of that solution says everything about the actual problem –NGSO earth stations are designed to sweep horizon-to-horizon looking or a strongest signal from the NGSO satellite, rather than looking at a single fixed point in the sky, as with GSO satellites.³⁶ More fundamentally, the fact that proponents of terrestrial use of the 12 GHz spectrum would even suggest such a crazy proposal tells the Commission all it needs to know as to whether there are any *workable* solutions to the incompatibility problems. There are none.

7. Reallocating the 12 GHz Band for Terrestrial Mobile 5G Use Cannot Be Squared With the Requirements of Section 303(y)

The *12 GHz NPRM* asks one fundamental gating question: Can the Commission reallocate this spectrum to squeeze in terrestrial mobile 5G use consistent with the requirements of Section 303 of the Communications Act?³⁷

We note that section 303(y) provides the Commission with authority to provide for flexible use operations *only if*: “(1) such use is consistent with international agreements to which the United States is a party; and (2) the Commission finds, after notice and opportunity for public comment, that (A) such an allocation would be in the public interest; (B) such use would not deter investment in communications services and systems, or technology development; and (C) *such use would not result in harmful interference among users*. We seek comment on whether adding a mobile allocation to the 12 GHz band to allow flexible, terrestrial use is consistent with this provision.³⁸

³⁶ See 12 GHz NPRM, *supra* note 1, ¶ 25 (“Given that all DBS earth stations look toward the southern sky for communication with GSO space stations orbiting at the equatorial plane, and given that high-gain antennas are necessary for base stations, can base station location and/or antenna orientation be situated to provide greater protection to DBS earth stations?”) Thus, while it may be possible to structure rules that allow for mobile terrestrial use vis-à-vis DBS systems, the same physics do not apply to NGSO systems, and pretending they do is to ignore fundamental orbital mechanics.

³⁷ Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat 251, 268-69 sec. 3005 Flexible Use of Electromagnetic Spectrum (codified at 47 U.S.C. § 303(y)). See also 47 C.F.R. §§ 2.106, 27.2, 27.3.

³⁸ *12 GHz NPRM*, *supra* note 1, ¶ 21 (emphasis added).

The statutory language here is clear. Unlike its overall broad authority to allocate spectrum under Section 303(c),³⁹ Congress specifically constrained the FCC's ability to change such allocations for flexible uses (*e.g.*, multiple different services operated by different entities within the same band) to instances where the change would not result in harmful interference among users. So for once, the burden is on the Commission to explain how the change will not introduce new interference, not on users whose service might be damaged by such new interference.⁴⁰

Few courts have been forced to directly address an FCC decision directly triggering a Section 303(y) analysis. In *Community Television, Inc. v. FCC*, for instance, the D.C. Circuit did not even address the challenge under Section 303(y), because it ultimately concluded that rejected a challenge by low power television stations to the digital TV transition, concluding that the requirement to convert from analog to digital television transmissions did not change the fundamental ability of licensees to deliver the service called for under their previous licenses.⁴¹

³⁹ 47 U.S.C. § 303(c).

⁴⁰ Although no court has directly addressed the issue, there is a strong argument that the FCC would not receive blanket *Chevron* deference in any decision it makes in this proceeding. *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 468 U.S. 837 (1984). Rather, a reviewing court would be required under Section 303(y) to review the record *de novo*.

⁴¹ *Community Television, Inc. v. FCC*, 216 F.3d 1133, 1141 (D.C. Cir. 2000) (Broadcasters will begin and end the transition period broadcasting television programming to the public under very similar terms. Although the FCC chose not to require 100% simulcasting on the NTSC and DTV channels throughout the transition, and Congress disfavored such an approach, see 47 U.S.C. § 336(a)(2), broadcasters will provide essentially the same services, with some flexibility to provide ancillary services as well, under their licenses during the transition").

More recently, the D.C. Circuit rejected claims by several C-Band satellite operators that the FCC's order partially reallocating the spectrum and "repacking" satellite operations into the upper 200 MHz of the C-Band did not violate Section 303(y).⁴² The *PSSI* court affirmed the FCC's order on three grounds:

- 1) Congress had specifically instructed the FCC to examine reallocation of the C-Band;⁴³
- 2) The FCC specifically found that existing C-Band users could be repacked into the upper 200 MHz and still offer existing and contemplated services,⁴⁴ and
- 3) The FCC required the new terrestrial users to pay existing users \$9.7 billion to vacate the spectrum early.⁴⁵

Indeed, petitioners barely even attempted to invoke Section 303(y), and the court easily dismissed their claims.

The [petitioners] invoke three other provisions of the Communications Act, but none helps their case . . . Section 303(y)(2)(C) requires the FCC to ensure that its spectrum allocation does not "result in harmful interference among users." But nothing in that provision bars the FCC from reducing harmful interference by reconfiguring the frequency band assigned to incumbent licensees.⁴⁶

⁴² *PSSI Global Services, LLC v. FCC*, 983 F.3d 1 (DC Cir. 2020), appealing Expanding Flexible Use of the 3.7 to 4.2 GHz Band, 85 Fed. Reg. 22, 804–05, 35 FCC Rcd 2343 (3) (April 23, 2020) (Order).

⁴³ *Id.* at 6 ("In March 2018, Congress passed the MOBILE NOW Act, which . . . identified the C-band as a promising candidate, and it instructed the FCC to provide notice and an opportunity for comment on 'the feasibility of allowing commercial wireless services, licensed or unlicensed, to use or share use of the frequencies between 3700 megahertz and 4200 megahertz.'").

⁴⁴ *Id.* at 5 ("At that time, eight companies operated satellites authorized to transmit signals within the United States over the C-band. Seven of them told the FCC that they could, through data compression and other technological upgrades, provide all their services within 200 megahertz (MHz) of the C-band.").

⁴⁵ *Id.* a 5-6.

⁴⁶ *Id.* at 10.

None these factors are present here. There is no specific Congressional call to reallocate the 12 GHz band. NGSO operators have demonstrated, in opposing the MVDDS Petition, that the 12 GHz spectrum is vital to their ability to deliver broadband services.⁴⁷ And the MVDDS advocates certainly are not stepping up to offer the billions of dollars necessary to reconfigure NGSO systems to either vacate the band, or complete reengineer them to become elliptical orbit systems viewable from Earth stations that can only look straight up in order to avoid debilitating interference from the proposed terrestrial uses. There is a heavy burden, therefore, on both the MVDDS advocates and the FCC to demonstrate how the proposed reallocation is consistent with Section 303(y).⁴⁸

CONCLUSION

TechFreedom is all for technological innovation. We have championed it since our inception, and it is, indeed, *in our name*. At the same time, however, we're cognizant of laws that supersede national or even international laws – the laws of physics. This is a clear case where the laws of physics preclude the proposed reallocation, and no amount of “nerding it out” is going to solve the technological impossibility. The FCC never should have adopted the *12 GHz NPRM*, and should move forward to an order declining to reallocate the spectrum, and maintain the existing rules for MVDDS operations, thus reducing critical uncertainty to investment in innovative satellite systems that this proceeding has engendered.

⁴⁷ See, e.g., Letter from David Goldman, Director of Satellite Policy, SpaceX (June 4, 2020), in RM-11768.

⁴⁸ We would also note that the *12 GHz NPRM* states that reallocation of the spectrum for mobile communications is inconsistent with ITU international spectrum allocations. 12 GHz NPRM at n. 66 (“We note the 12 GHz band has not been proposed at the International Telecommunication Union (ITU) for 5G or International Mobile Telecommunications (IMT) use at this time.”). This is an additional hurdle MVDDS advocates and the Commission must address under the restrictions of Section 303(y).

Respectfully submitted,

_____/s/____

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