

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

In the Matter of)	
)	
Petition for Rulemaking to Permit)	RM - 11768
MVDDS Use of the 12.2-12.7 GHz Band)	
for Two-Way Mobile Broadband Service)	

EX PARTE COMMENTS OF TECHFREEDOM

TechFreedom hereby files these *ex parte* Comments in response to the Petition for Rulemaking (“Petition”) filed by the MVDDS 5G Coalition (“MVDDS Coalition”) on April 26, 2016.¹ In the Petition, the MVDDS Coalition requests an NPRM be issued looking to reallocate the 12 GHz spectrum (12.2-12.7 GHz) for two-way terrestrial use, allegedly to support 5G deployment. 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.

¹ See Petition of MVDDS 5G Coalition for Rulemaking, RM-11768 (Apr. 26, 2016), <https://ecfsapi.fcc.gov/file/60001692292.pdf>.

TechFreedom and undersigned counsel have a long history advocating for innovative uses of outer space.² The instant petition sits at the intersection of spectrum policy and space law, a place we've inhabited for decades. We are uniquely suited to provide commentary on the MVDDS Coalition Petition.

2. Introduction

"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 millions in investment dollars without any real products or business models.³ Mention "5G" today and heads turn. If you're *for* 5G, in any form, you 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 always be

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-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/>; J. Dunstan, "Space Trash: Lessons Learned (and Ignored) from Space Law and Government," 39 J. OF SPACE L. 23 (2013).

³ 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 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.

“winners” and “losers.” Merely appending “5G” to your cause doesn’t put you on the winning side in all spectrum battles.

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

5G (or “fifth generation”) is the next step in improving the throughput in the nation’s 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.”⁴

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 any other use. There is a reason why we have a Table of Allocations in Part 2 of the FCC’s rules,⁵ 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, including those unimaginable then and even today. In the rush to embrace the newest communications protocol, it may appear that 5G is “*it*” — the end of technology, that it is, and will be forever, the highest and best use of spectrum.

Call that attitude, to paraphrase Francis Fukuyama, “The End of History and the Last MHz.”⁶ It is an easy trap to fall into whenever a new technology seizes the imagination, but

⁴ FCC Chairman Pai, *The FCC’s 5G FAST Plan*, FCC, <https://www.fcc.gov/5G> (last visited Oct. 8, 2020).

⁵ 47 C.F.R. Part 2.

⁶ FRANCIS FUKUYAMA, *THE END OF HISTORY AND THE LAST MAN* (1992).

it is woefully short-sighted. We must not forget the “Negroponte Switch”: current communications delivery methods are not due to some fundamental law of physics, but rather by the “accidents of engineering history.”⁷ Engineering changes, history changes, and we can’t afford to go “all in” on 5G if it means sacrificing the as-yet-unknown, and unknowable, value of other potential uses of spectrum.

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

When FCC Chairman Pai talks about closing the Digital Divide, he often references his travels into rural America, and particularly his 2017 trip onto the Navajo Nation.⁸ That particular visit was to the Twin Arrows Casino, located on the very edge of the Navajo Nation, and still within a short drive of Flagstaff, Arizona. While rural, Twin Arrows is not a true reflection of the many places in America so removed from infrastructure as to be indistinguishable from the way they were 100 or even 500 years ago. It is in these most deeply rural areas of the United States (areas that NTIA originally wished to designate as “wilderness” or “frontier” in order to avoid having to deploy the new FirstNet system into),⁹ that satellite systems *must* be part of our overall communications infrastructure.

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

⁷ See, N. NEGROPONTE, BEING DIGITAL (1996).

⁸ See Remarks of FCC Chairman Ajit Pai at the National Tribal Broadband Summit (Sept. 21, 2020), available at <https://docs.fcc.gov/public/attachments/DOC-367034A1.pdf>; Remarks of FCC Chairman Ajit Pai at the 2.5 GHz Rural Tribal Window Workshop (Jan. 14, 2020), available at <https://docs.fcc.gov/public/attachments/DOC-361885A1.pdf>.

⁹ See Notice and Request for Comment, 79 Fed. Reg. 57058 (Sept. 24, 2014) (“we seek comments on whether we should define a separate term for a frontier or wilderness area that would bound the term rural in connection with provisions of the Act.”).

Fairfax and then Fauquier counties on I-66, you will find construction. The road gets wider 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 strips 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 only works well when combined with mid-band and low-band frequencies, capable of transmitting out many miles. It is a pipe dream to hypothesize that high-band 5G, such as proposed in the Petition, is going to make it out to all those dirt roads and paths.

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*, 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.¹⁰

¹⁰ Mitigation of Orbital Debris in the New Space Age, Report and Order and Further Notice of Proposed Rulemaking, FCC 20-54 (Apr. 24, 2020) (Chairman Pai statement).

In his blog announcing the *Mitigation of Orbital Debris* order, 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.¹¹

But such innovative NGSO systems cannot operate without spectrum, or more particularly here, can’t work if the spectrum assigned to them is subject to 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-valued, better uses immediately, or more money received in auction, if it is repurposed for terrestrial purposes.¹² 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

¹¹ Ajit Pai | FCC Chairman, *Digging in for the Long Haul*, FCC (Apr. 1, 2020), <https://www.fcc.gov/news-events/blog/2020/04/01/digging-long-haul>.

¹² 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).

of International Footnote S5.394 to Part 2, calling for aeronautical telemetry to have priority over other users in the band.¹³ As he 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 launch using the 2345-2360 band better hope no one decides to order a pizza 60 seconds into the flight.¹⁴

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 remained science fiction fantasies for decades, today they are real, and are being deployed even as this debate plays out.¹⁵

¹³ See James 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 247, 247-253 (1997), <https://techfreedom.org/wp-content/uploads/2020/10/SSI-1997-Earth-to-Space-I-cant-Hear-You.pdf>.

¹⁴ *Id.* at 252.

¹⁵ Just this Tuesday, SpaceX launched its latest 60 Starlink satellites, bringing its constellation to almost 800 satellites. See Amy Thompson, *SpaceX launches 60 Starlink satellites and lands rocket at sea*, SPACE (Oct. 6, 2020), <https://www.space.com/spacex-starlink-12-internet-satellites-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 2, 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/>.

From the comments filed in response to the Petition, the evidence is clear: reallocating the 12 GHz spectrum for 5G terrestrial uses will wreak havoc on NGSO FSS operations — the very services the FCC is banking on to deliver broadband to the “last rural mile.”¹⁶ 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 not prove feasible, without substantial constraints on one or both services.”¹⁷ 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.¹⁸

Such a “let them eat cake,” or “you’re smart, you figure it out” approach to spectrum management is not merely bad spectrum policy. It is an abdication of the FCC’s statutory responsibility to “encourage the provision of new technologies and services to the public.”¹⁹

¹⁶ See, e.g., Letter from SpaceX to Marlene H. Dortch, FCC (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).

¹⁷ Reply Comments of MVDDS 5G Coalition, Appendix A at 1, RM-11768 (June 23, 2016), <https://ecfsapi.fcc.gov/file/10624302102162/MVDDS%205G%20Coalition%20Reply.pdf> (emphasis added).

¹⁸ RS Access, MVDDS 5G Coalition Petition for Rulemaking to Permit MVDDS Use of the 12.2-12.7 GHz Band for Two-Way Mobile Broadband Service at 44, RM-11768 (July 2, 2020), <https://ecfsapi.fcc.gov/file/1070298281969/RS%20Access%20-%2012%20GHz%20Band%20Ex%20Parte%20-%2007.02.20%20%5BAtt%5D.pdf>.

¹⁹ 47 U.S.C. § 157(a).

CONCLUSION

Some petitions for rulemaking are not worth maturing into an NPRM. This is one. No matter how noble the cries for spectrum coming from potential 5G operators, the FCC must not abdicate its responsibility to make spectrum decisions in a way that properly balances the needs of users, as well as preserving spectrum for future uses. If time tells us anything, it is that once terrestrial users get their hands on spectrum (whether they get it for free or win it through an auction), they will never give it up, citing the embedded user base and millions spent by consumers on equipment as reasons not to dislodge them. The record is clear: the proposed reallocation of the 12 GHz spectrum cannot occur without devastating damage to NGSO broadband systems. The FCC should dismiss the instant Petition.

Respectfully submitted,

TECHFREEDOM

_____/s/_____

James E. Dunstan
General Counsel

110 Maryland Ave., NE
Suite 205
Washington, DC 20002

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