Before the
DEPARTMENT OF COMMERCE
National Telecommunications and Information Administration
Washington DC, 20230

In the Matter of	)	
	)	
Development of a National Spectrum Strategy	)	Docket No. 230308-0068
	)	

COMMENTS OF DISH WIRELESS L.L.C.

DISH Wireless L.L.C ("DISH") appreciates the opportunity to respond to National Telecommunications and Information Administration's ("NTIA") request for comment on the development and implementation of a National Spectrum Strategy for the United States.[1] DISH urges NTIA to include the 12.2-12.7 GHz band ("12 GHz Band") and the Citizens Broadband Radio Service ("CBRS") in its spectrum pipeline, and to encourage the FCC to modernize both these bands to promote mobile and fixed broadband connectivity, increase domestic wireless competition, close the digital divide, and ensure the United States' international leadership on spectrum policy.

I. INTRODUCTION

DISH welcomes NTIA's efforts to establish a National Spectrum Strategy to plan effectively for the country's current and future spectrum needs. The spectrum policies the government makes today will foster innovation, drive competition, and build resilient wireless networks for generations to come. DISH agrees with the 2021 Executive Order, "Promoting

[1] Development of a National Spectrum Strategy, Request for Comment, Docket No. 230308-0068 (rel. Mar. 15, 2023).

Competition in the American Economy," which found that to promote competition, lower prices, and a vibrant and innovative telecommunications ecosystem, federal policies should "improve the conditions of competition in industries that depend upon radio spectrum, including mobile communications and radio-based broadband services."[2]

As the operator of the world's first cloud-native standalone Open RAN 5G network and the country's new facilities-based wireless entrant, DISH is deploying spectrum through a new, modern network fundamentally different from current mobile network operators. Through its deployment, DISH has seen first-hand how Open RAN virtualization can facilitate swift network updates, innovation, and greater competition.

These advances demonstrate how the nation's interests are served by a robust and resilient trusted global marketplace of companies within the United States, and in partner countries with integrated technology markets.[3] To further promote the Open RAN approach and foster competition in the wireless marketplace, NTIA should urge the FCC to update the rules in the 12 GHz and the CBRS bands.

I. THE 12 GHz BAND IS IDEALLY SUITED FOR MORE INTENSIVE USES

The 12 GHz Band is the spectrum band that keeps giving: it has already been a success story for Direct Broadcast Satellite ("DBS") services, and the FCC has begun writing its next chapter. Currently, the band is allocated on a co-primary basis to DBS, Fixed Satellite Service limited to non-geostationary orbit systems ("NGSO FSS") and Multi-Channel Video and Data Distribution Service ("MVDDS"). But, the 12 GHz Band is capable of more: with updated rules, this band is well suited to provide 500 MHz of terrestrial spectrum for commercial investment

[2] *See* Executive Order 14036, Promoting Competition in the American Economy, 86 FR 36,987 (July 9, 2021).
[3] *See* Comments of the Open RAN Policy Coalition, Docket No. 221202-0260, at 9 (Jan. 27, 2023).

and innovation that will help the United States remain a leader in 5G. This outcome would be a substantial boon for the nation's economy and security, and can be achieved without upending existing services. Higher-power two-way mobile and fixed services are possible and fully consistent with protecting users in the band. The time is now for the FCC to update the rules for 12 GHz and enable the band's full potential.

Technological Advances Further Improve the Prospects for Sharing Between DBS and Flexible-Use MVDDS. In 2016, the MVDDS Coalition described the many technological advances since MVDDS was first authorized nearly twenty years ago in the 12 GHz Band. As the Coalition explained, these advances will enable sharing the 12 GHz Band between terrestrial flexible use, on the one hand, and DBS as well as NGSO FSS, on the other. These developments, such as targeted small-cell deployments, and advanced antenna techniques such as massive multiple input multiple output antennas, advanced beamforming and beam steering, all allow better control of transmitter energy and therefore can protect DBS and NGSO systems from interference.

Other advances include channel bonding to better integrate discrete bands of spectrum across large ranges of frequency, and dynamic spectrum sharing to increase efficiency associated with moving from prior generation to next-generation networks. In the face of these developments, the uncertainties about MVDDS that caused the FCC to err on the side of caution in its prior rulemakings are no longer present.

Broad support for a Mobile Service allocation. Since 2016, a large and diverse range of stakeholders have come out in support of enabling greater terrestrial use in the 12 GHz Band, including existing licensees and 5G proponents, commercial actors large and small, and prominent representatives of the public interest community. 36 of these supporters redoubled

their efforts by forming the 5G for 12 GHz Coalition,[4] whose mission is to unleash the power of 5G by making the 12 GHz Band available for terrestrial wireless services. This broad support is not an accident: it springs from, and further validates, the significant benefits of authorizing 5G in the 12 GHz Band.

Sharing between 5G and DBS, and NGSO FSS is Eminently Possible. The 12 GHz Band represents 500 megahertz of mid-band spectrum that is well-suited for terrestrial, two-way use cases, while still protecting satellite operations. Indeed, various engineering analyses have been submitted in the FCC's record that demonstrate higher-power terrestrial operations (including mobile, fixed and backhaul) in the 12 GHz band can co-exist with NGSO systems[5] and DBS operations.[6]

The 12 GHz Band Is Ideal for Terrestrial Services. The 12 GHz Band represents a unique opportunity to propel the U.S. to undisputed leadership in the race to 5G. The band contains 500 MHz of contiguous mid-band spectrum that, if used for terrestrial flexible use

[4] The 5G for 12 GHz Coalition consists of 36 diverse and prominent public interest groups, trade associations, and companies in the telecommunications sector, calling on the FCC to act swiftly to allow the 12 GHz Band to unlock the power of 5G for all Americans. The Coalition has steadily grown since its formation and now consists of the following members: A Side Technology, Airspan, AtLink, Benton Institute for Broadband and Society, BroadbandOne, Cambridge Broadband Networks Group, Center for Educational Innovation, Center for Rural Strategies, Ceragon, Computer & Communications Industry Association, DISH, Dell Technologies, Etheric Networks, Federated Wireless, Geolinks, Globtel, Go Long Wireless, Granite, Incompas, MMwave Tech LLC, MVD53, Mavenir, Mixcomm, New America, NextLink, Public Knowledge, RS Access, Resound Networks, Rise Broadband, Rural Wireless Association, Starry, VM Ware, WeLink, White Cloud, X Lab, and Xiber. *See* 5g for 12 GHz Coalition, *available at* https://5gfor12ghz.com.

[5] *See* RKF Engineering Solutions LLC, Assessment of Feasibility of Coexistence between NGSO FSS Earth Stations and 5G Operations in the 12 GHz Band (May 2021) (submitted as Appendix to Comments of RS Access, LLC, WT Docket No. 20-443, GN Docket No. 17-183 (May 7, 2021)); Letter of V. Noah Campbell, RS Access, LLC, to Marlene Dortch, FCC, WT Docket No. 20-443 (May 19, 2022), attaching RKF Engineering Solutions LLC, The Effect of 5G Deployment on NGSO FSS Downlink Operations in the 12.2-12.7 GHz Band (May 19, 2022).

[6] *See* Comments of MVDDS 5G Coalition, RM-11768, attaching Tom Peters, MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence (June 8, 2016); Reply Comments of the MVDDS 5G Coalition, RM11768, attaching Tom Peters, MVDDS 12.2-12.7 GHz Co-Primary Service Coexistence II (June 23, 2016).

(including 5G wireless broadband, fixed wireless access, and backhaul), could help unlock the full potential of 5G in the U.S. for decades to come. The FCC has identified mid-band spectrum as "well-suited for next generation wireless broadband services due to the combination of favorable propagation characteristics (compared to high bands) and the opportunity for additional channel re-use (compared to low bands)."[7, 8]

The 12 GHz Band answers the need for more mid-band spectrum. First, it has no federal government incumbents that need to be moved. Second, 500 MHz of available contiguous spectrum will allow for high-peak data transmission rates.[9] Third, the near-global Mobile Service allocation allows for potentially harmonized global use of the band.[10] Fourth, the existing manufacturing ecosystem for the 12 GHz Band will help reduce the production costs for new 5G equipment in the band. Fifth, the band is not balkanized by being apportioned among a large number of licensees. In fact, the band is used by a finite number of licensees, each of which has access to its entirety, either in a local market or for the entire nation.

Unlocking the 12 GHz Band for 5G Is Crucial for American National Security. Leadership in the 5G race requires mid-band spectrum in general and the 12 GHz Band presents

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[7] Expanding Flexible Use of the 3.7 to 4.2 GHz Band, *Order and Notice of Proposed Rulemaking*, 33 FCC Rcd. 6915, 6917 ¶ 5 (2018) ("C-Band NPRM").

[8] *See* Samsung 5G Vision 28 GHz Mobile Technologies, Samsung, at 10-13 (2016), https://www.docomo.ne.jp/binary/pdf/corporate/technology/rd/tech/5g/5GTBS2016_TECH_WORKSHOP_SAMSUNG.pdf; *see also* Comments of Ericsson, GN Docket No. 14-177, at 25 (Jan. 26, 2016) (Higher frequency bands face "greater challenges" in transmissions between outdoor and indoor points); Comments of Google Inc. and Google Fiber Inc., GN Docket No. 14-177, at 7 (Sept. 30, 2016) ("Google Comments").

[9] *See, e.g.*, Petition of MVDDS 5G Coalition for Rulemaking, RM-11768, at 4 (Apr. 26, 2016) ("MVDDS Petition"); *see also* Roberson and Associates, LLC, The 12 GHz Band: Analysis of Physical Characteristics and Applicable Technologies (July 7, 2021) ("Roberson Report"), appended to Reply Comments of RS Access, LLC, WT Docket No. 20-443, GN Docket No. 17-183 (filed July 7, 2021). Based on these findings, the study's authors were able to conclude that "propagation characteristics of the 12 GHz band are highly favorable for 5G and resemble those of the lower mid-band frequencies" while retaining "significant capacity and throughput benefits, similar to those available in the mmW bands, but at lower cost."

[10] *See* MVDDS Petition at 8.

a unique opportunity to unlock more mid-band spectrum. But why is it important to win that race? National security, American jobs, and closing the digital divide are some critical benefits that can be unlocked by winning the race to 5G.

A modern national security apparatus requires both technological prowess and economic leverage, in addition to military strength.[11] As the Council on Foreign Relations' Independent Task Force concluded: "[c]ountries that can harness the current wave of innovation, mitigate its potential disruptions, and capitalize on its transformative power will gain economic and military advantages over potential rivals."[12] China, for its part, has recognized this reality and is heavily investing in 5G.[13] A recent study showed that the U.S. currently ranks last among 13 major wireless markets in the availability of 5G mid-band spectrum.[14] Even after the C-band auction, the U.S. remains behind China. As the Congressional Research Service found, "China is the current leader in [low-band and mid-band] technologies and is likely to deploy the world's first 5G wide-area network."[15] But opening up 500 MHz of the 12 GHz Band to 5G would allow the U.S. to pole-vault over China. Successfully meeting the challenges presented by China will

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[11] *See* The Power of America's Example: The Biden Plan for Leading the Democratic World to Meet the Challenges of the 21st Century, Biden for President, https://joebiden.com/americanleadership ("Joe Biden believes that economic security is national security."); Attorney General William P. Barr Delivers the Keynote Address at the Department of Justice's China Initiative Conference, Department of Justice (Feb. 6, 2020), https://www.justice.gov/opa/speech/attorney-general-william-p-barr-delivers-keynote-address-department-justices-china ("It has been America's technical prowess that has made us prosperous and secure.").

[12] *See* James Manyika & William H. McRaven, *Innovation and National Security: Keeping Our Edge*, Independent Task Force Report No. 77, Council on Foreign Relations, at 4 (2019), https://www.cfr.org/report/keeping-our-edge/pdf/TFR_Innovation_Strategy.pdf.

[13] *See* David H. McCormick, Charles E. Luftig & James M. Cunningham, *Economic Might, National Security, and the Future of American Statecraft*, 3(3) Texas National Security Review 50, at 55 (2020), http://dx.doi.org/10.26153/tsw/10222. ("Future of American Statecraft")

[14] *See* Janette Stewart, Chris Nickerson & Tamlyn Lewis, *5G Mid-Band Spectrum Global Update, Analysys Mason*, at 2 (Mar. 2020), https://mma.prnewswire.com/media/1136543/5G_Mid_Band_Spectrum_Global_Update.pdf?p=pdf.

[15] *See* National Security Implications of Fifth Generation (5G) Mobile Technologies, Congressional Research Service, at 1(Mar. 14, 2023), https://crsreports.congress.gov/product/pdf/IF/IF11251.

require a significant investment in, and broadening of, U.S. digital and technological infrastructure—specifically and especially in 5G.

The 12 GHz Band is Ideal for Open RAN. Through advances in radio and antenna technologies, and disaggregated hardware and software, radios are able to carry multiple spectrum bands. This will allow 5G infrastructure to be leveraged and additional spectrum, including the 12 GHz Band, to be deployed and integrated into Open RAN 5G networks. Given that the enormous benefits of allowing 5G operations in the 12 GHz Band can be realized without harmfully interfering with existing operations, NTIA should urge the FCC to act expeditiously to unlock the power of 5G in this band. As Chairwoman Rosenworcel stated, "freeing up more spectrum, and especially mid-band spectrum, for 5G" is one of the "key principles to help guide our 5G future."[16] We agree.

II. RATIONALIZING CBRS POWER LEVELS AND TDD SYNCRONIZATION

DISH is committed to the success of CBRS spectrum, as it holds nationwide licenses in this band. To be successful, however, CBRS power levels need to be rationalized with adjacent bands. Doing so will provide carriers and consumers significant benefits by enabling more efficient use of the spectrum, lowering the costs of deployment, and ensuring that the U.S. has mid-band spectrum allocations that are comparable to the large 5G frequency bands available in most of Europe and the rest of the world.[17] Notably, this can be achieved without harming

[16] Questions for the Record (Majority), Jessica Rosenworcel, Senate Commerce, Science, and Transportation Committee, at 5 (Nov. 24, 2021), https://www.commerce.senate.gov/services/files/A853CE11-3D3C-4747-ADFC-817E6959B6F6.

[17] *See* Letter from Jeffrey H. Blum, DISH, to Marlene H. Dortch, FCC, WT Docket No. 19-348 (Mar. 5, 2021); *see also* Letter from Jeffrey H. Blum, DISH, to Marlene H. Dortch, FCC, WT Docket No. 19-348 (Mar. 31, 2021); Letter from Jeffrey H. Blum, DISH, to Marlene H. Dortch, FCC, WT Docket Nos. 20-443 and 19-348 (May 9, 2022); Letter from Alexi Maltas, CCA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 19-348, GN Docket No. 17-258 (Apr. 9, 2021) ("CCA Apr. 9, 2021 Ex Parte Letter").

existing deployments of spectrum for Priority Access License ("PAL") and General Authorized Access ("GAA") users, and incumbents.

Reassert U.S. Leadership in the 3 GHz band. Higher power levels in the CBRS band will further enable the United States to lead in mid-band spectrum. It will enable future-proof deployments and allow for rationalized service rules across the 3 GHz band that, among other benefits, will enable U.S. operators to purchase equipment from the globally-scaled equipment ecosystem.[18] Other parties have recognized these benefits. The Competitive Carrier Association ("CCA") explained higher power levels not only will increase the utility of the band for both PAL and GAA users, but will do so without increasing the risk of interference to other users.[19] CCA further stated that allowing for higher power would require no changes in functionality to the Spectrum Access System, and would not increase interference risk to other bands since an industry led solution for synchronization will be necessary for optimal operations *regardless* of CBRS power limits.[20] Thus, if the FCC were to adopt higher power levels, it would provide significant consumer benefits, further close the digital divide in rural America, and promote U.S. leadership in 5G.

The time is right for the Commission to move forward with a proceeding to raise power levels.[21] Rationalizing service rules throughout the entirety of the 3 GHz band could create 530 MHz of contiguous mid-band spectrum (3450-3980) with similar power levels. As noted in a recent study DISH submitted in the FCC's record, higher power in the CBRS band would not harm existing PAL or GAA users.[22] In fact, higher power levels would not only benefit PALs,

[18] DISH Mar. 5, 2021 *Ex Parte* Letter at 2, 3.
[19] CCA Apr. 9, 2021 *Ex Parte* Letter at 2.
[20] CCA Apr. 9, 2021 *Ex Parte* Letter at 9.
[21] *See* FCC, Chairwoman Rosenworcel Statement on the Expiration of FCC Spectrum Auction Authority, Press Release (Mar. 10, 2023).
[22] DISH Mar. 31, 2021 *Ex Parte* Letter at 1, 8.

but GAA users would benefit from higher power levels in future deployments.[23] This is because both PAL and GAA users would benefit from the globally-scaled equipment ecosystem. Deployments in the CBRS band would thus be more efficient and no longer be encumbered by sitting between the higher power deployments in the 3.45 GHz Band and the 3.7 GHz Band.

For these reasons, we encourage NTIA to review the FCC's record and to urge the agency to think holistically about all currently licensed mid-band spectrum and consider how other countries plan to utilize the 3 GHz band. The FCC should, as a first step, ensure TDD systems are synchronized throughout the band which will help promote its utility in the interim. These steps will help reassert American leadership in mid-band spectrum policy, enabling NTIA and the FCC to improve on its already successful innovative sharing regime and further drive down costs, increase competition, and close the digital divide.

III. CONCLUSION

With this in mind, DISH urges NTIA to include targeted changes to the rules for the 12 GHz and CBRS bands in its spectrum pipeline and to encourage the FCC to incorporate these operational and technical rules to improve the efficiency of these bands and foster competition.

[23] DISH Mar. 31, 2021 *Ex Parte* Letter at 8.