

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

In the Matter of)	
)	
Use of Spectrum Above 24 GHz for)	GN Docket No. 14-177
Mobile Radio Services)	
)	
Prompt Implementation of Part 96 Citizens)	GN Docket No. 15-319
Broadband Radio Service (CBRS) Rules in the)	
3.5GHz Band)	
)	
Expanding Flexible Use in Mid-Band)	GN Docket No. 17-183
Spectrum Between 3.7 and 24 GHz)	
)	
Promoting Investment in the 3550-3700 MHz)	GN Docket No. 17-258
Band)	

**COMMENTS OF ECHOSTAR SATELLITE OPERATING COMPANY
& HUGHES NETWORK SYSTEMS, LLC**

I. INTRODUCTION

EchoStar Satellite Operating Company (“ESOC”) and Hughes Network Systems, LLC (“Hughes”) (together “EchoStar”) hereby submit these comments to the Federal Communications Commission (“Commission”) in the above-captioned proceedings in response to the Spectrum Pipeline Act Public Notice.¹ In preparation for the report it is required to submit to Congress the Commission seeks comment on the results of the 2015 rule changes relating to the 3550-3650 MHz frequency band and “an analysis of proposals to promote and identify

¹ *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment Pursuant to the Spectrum Pipeline Act of 2015*, Public Notice, DA 18-841 (Aug. 10, 2018). (“*Spectrum Pipeline Public Notice*”).

additional spectrum bands that can be shared between incumbent uses and new licensed and unlicensed services under such rules and identification of at least 1 gigahertz between 6 GHz and 57 GHz for such use.”²

ESOC is the nation’s largest commercial geostationary orbit (“GSO”) satellite operator, and the fourth largest GSO operator worldwide. ESOC operates a fleet of 24 satellites providing broadcast, broadband, fixed and mobile services. These operations meet the needs of small and large customers, including media and broadcast organizations, direct-to-home (“DTH”) providers, enterprise customers, government service providers, and residential consumers in North America and globally.³

Hughes is the leading provider of satellite consumer broadband services in the United States and globally, with over 1.2 million hard-to-reach subscribers in the Americas. Hughes provides its broadband service through the use of a three satellite, GSO, Ka-band network over the United States. Since launching JUPITER II, its new satellite providing broadband service at speeds of over 25 Mbps down and 3 Mbps up for residential customers, and 55 Mbps down and 5 Mbps up for enterprise users, almost half of Hughes’ 1.2 million satellite broadband customers have migrated to the new service.⁴

² *Id.* at 1, citing Spectrum Pipeline Act of 2015, Pub. L. No. 114-74, § 1008, 129 Stat. 621, 625 (2015), as amended by RAY BAUM’s Act of 2018, Pub. L. 115-141, § 614, 132 Stat. 1080, 1109 (2018) (“Spectrum Pipeline Act”).

³ Press Release, Hughes, *Bank BRI Selects Hughes to Power Next Generation Satellite Network* (July 17, 2018), <https://www.prnewswire.com/news-releases/bank-bri-selects-hughes-to-power-next-generation-satellite-network-300681825.html>.

⁴ *Id.*

Hughes' next-generation JUPITER III satellite is already under construction at Space Systems Loral in California, and is planned for launch in late 2020. JUPITER III, the first-of-its-kind ultra-high density satellite, is designed to provide two-way internet service at even higher speeds of up to an estimated 100 Mbps down and 10 Mbps up using the Ka, Q, and V-bands delivering expanded service millions of households throughout the United States.⁵ Jupiter III is expected to begin service in 2021.⁶

II. THE SPECTRUM ACCESS SYSTEM CREATED FOR THE 3.5 GHZ BAND SHOULD NOT BE ADOPTED FOR OTHER FREQUENCY BANDS BETWEEN 6 GHZ AND 57 GHZ

EchoStar shares the Commission's goal of exploring new methods of spectrum sharing and promoting diverse network technologies. EchoStar actively supports the efficient use of spectrum resources and, accordingly has a strong history of seeking and implementing technological advances to efficiently and dynamically utilize the spectrum resources available.⁷

⁵ Hughes is also a technology manufacturer. In addition to developing its own innovative satellite broadband network, Hughes manufactures ground network systems for other satellite providers in the industry. For example, Hughes is building out OneWeb's ground infrastructure, including gateways and user terminals, to support OneWeb's constellation of Low Earth Orbit (LEO) satellites in its mission to bring affordable broadband service to millions of households, schools and other end users around the world. The joint development of the ground network began in 2015 and shipments began in March 2018.

⁶ Press Release, Hughes, *Hughes Selects Space Systems Loral to Build Next-Generation Ultra High Density Satellite* (Aug. 9, 2017), <https://www.echostar.com/en/Press/Newsand-media/Hughes%20Selects%20Space%20Systems%20Loral%20To%20Build%20Next-Generation%20Ultra%20High%20Density%20Satellite.aspx>.

⁷ See White Paper, Hughes, *Evolution of Hughes Network Systems LLC's Broadband Satellite Services from Narrowband to Federal Communications Commission-Defined Broadband Speeds* (Apr. 2017) (Attached hereto as Appendix A), emphasizing Hughes' need for sufficient spectrum access in the Ka, Q and V bands to meet "the growing demands of U.S. consumers for cost-effective, high-speed broadband connectivity no matter where they live or work." *Id.* at 6.

More broadly, satellite operators and satellite service providers have long led the way in efficient use of spectrum and have an established history of spectrum sharing. Many of the frequency bands that satellite systems operate in are shared among a wide variety of commercial and governmental services, including terrestrial services. As an example, in the Ka band and the V band – both encompassed by the *Spectrum Pipeline Public Notice* – fixed satellite services provided via the geostationary orbit and the non-geostationary orbit, and terrestrial services, both commercial and government, all share a discrete amount of spectrum in the United States to offer consumers and government users broadband and other important services.

In 2015, the Commission adopted rules for commercial operations in the 3550-3700 MHz band, making the band available in phases for wireless broadband and other innovative uses through a three-tiered sharing framework enabled by a Spectrum Access System (“SAS”).⁸ The spectrum sharing framework was created for three types of authorized users: Incumbents, Priority Access Licenses and General Authorized Access. The Commission established the 3.5 MHz band as an “innovation band” in an effort to “break[] down age-old regulatory barriers to create a space for a wide variety of users to coexist by sharing spectrum.”⁹ The Commission noted the uniqueness of the 3.5 GHz band in that opening the band for commercial broadband uses would require the continued protection of important incumbent military radar operations.¹⁰

⁸ *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015) (“*3.5 GHz Band Order*”), Order on Reconsideration and Second Report and Order (2016).

⁹ News Release, FCC Puts Final Rules in Place for New Citizens Broadband Radio Service, (Apr. 28, 2016), <https://docs.fcc.gov/public/attachments/DOC-339104A1.pdf>.

¹⁰ *3.5 GHz Band Order*, 30 FCC Rcd at 3987 ¶ 86.

In the 2015 Spectrum Pipeline Act, Congress directed the FCC to prepare a report that discusses how it can free up at least 1 GHz of spectrum that can be shared between incumbent uses and new licensed and unlicensed services in the frequency bands between 6 GHz and 57 GHz.¹¹ Current Commission leadership has expressed an interest in balancing the move toward more spectrum sharing with protecting incumbent operations, including several bands currently allocated for incumbent satellite operations. Chairman Pai has noted that as the Commission provides access to “spectrum to unleash new terrestrial licensed and unlicensed uses ... we can’t neglect the critical role played by satellite service.”¹² In a 2017 speech, Commissioner O’Rielly noted that spectrum chosen for sharing “is not homogenous and different sub-bands may need different sharing mechanisms ... it is necessary to determine exactly what is needed to protect incumbent uses.”¹³

EchoStar agrees that spectrum sharing is an important goal and something that needs to be analyzed carefully – on a case-by-case basis. However, the spectrum sharing model adopted for the 3.5 GHz band should not just be applied to other spectrum bands, unless appropriate. Every band is unique and requires its own spectrum sharing model with respect to its incumbent and future operations.¹⁴ If the 3.5 GHz approach were adopted in its entirety in other bands that

¹¹ See Spectrum Pipeline Act.

¹² Ajit Pai, Chairman, FCC, Remarks at the Satellite Industry Association’s 21st Annual Leadership Dinner at 2 (Mar. 12, 2018), <https://docs.fcc.gov/public/attachments/DOC-349676A1.pdf>

¹³ Michael O’Rielly, Commissioner, FCC, Remarks Before the 6th Annual Americas Spectrum Management Conference at 4 (Oct. 13, 2017), <https://docs.fcc.gov/public/attachments/DOC-347222A1.pdf> (referring to the potential for opening up the 6 GHz band for wireless use).

¹⁴ Sharing may not be feasible in all instances. For example, when there are two ubiquitous services sharing the same frequency band, such as satellite user terminals and 5G terrestrial

do not have the same unique policy and technical underpinnings, there could be serious consequences to investment and innovation in satellite services in those bands, as well as the interference environment. Protecting incumbent operations from harmful interference is essential and must be carefully weighed against the potential new uses of such bands that sharing could enable.

EchoStar therefore cautions the Commission against assuming that the 3.5 GHz model can easily be applied in other spectrum bands with different characteristics and underlying users. Rather, before any such use of a new frequency band is proposed, the Commission must engage in the proper evaluation and study of the consequences of potential spectrum sharing in a given frequency band to ensure that incumbent operations will not be harmed by new entrants.

If the approach adopted in the *2015 Order* is utilized in other frequency bands in which satellite services operate, the American public would face diminished availability of important satellite services. Satellite operators today provide a wide-range of services to U.S. consumers, first responders, government users and industry. In addition, millions of Americans live in regions hampered by limited terrestrial connectivity options, and satellite services often are the only option for broadband connectivity. If the Commission adopts the model created for the 3.5 GHz band in other bands shared with satellite services, each of these critical communications needs could go unmet if true sharing among services, one that allows future growth, is not authorized.

broadband, it has been demonstrated at the ITU and at the FCC, that such sharing is not feasible. *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988, 11049-50 ¶¶ 188-89 (2017).

III. CONCLUSION

As the Commission moves forward with identifying additional bands for sharing between incumbent operators and new licensed and unlicensed services for its November 2018 report to Congress, it should exercise caution. Spectrum sharing is an important tool to be used as frequency bands are identified for potential new uses. However, the unique nature of each frequency band, including the incumbent uses of each band, must be given due consideration as the Commission explores new sharing mechanisms. Incumbent satellite operations must be protected to ensure that satellite operators can not only continue to serve existing customers but also invest in and pursue new and innovative uses of satellite technology.

Respectfully submitted,
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