



MEMORANDUM

July 12, 2019

To: Subcommittee on Communications and Technology Members and Staff

Fr: Committee on Energy and Commerce Staff

Re: Hearing on “Our Wireless Future: Building A Comprehensive Approach to Spectrum Policy”

On **Tuesday, July 16, 2019, at 10:30 a.m. in room 2322 of the Rayburn House Office Building**, the Subcommittee on Communications and Technology will hold a hearing entitled, “Our Wireless Future: Building A Comprehensive Approach to Spectrum Policy.”

I. KEY FCC SPECTRUM ISSUES AND PROCEEDINGS

Electromagnetic spectrum—often referred to simply as spectrum—is used to deliver radio, broadcast television (TV), cellular, and wireless broadband internet services, including 5G wireless technology. There is a finite amount of spectrum available. The Federal Communications Commission (FCC) manages the commercial use of spectrum¹ while the National Telecommunications and Information Administration (NTIA) manages federal use.²

Wireless service providers are seeking a range of spectrum bands (low, mid, and high) to deploy 5G services.³ Depending on the frequency, spectrum has different characteristics. High-band spectrum fades over shorter distances and is less able to penetrate buildings and trees than mid- or low-band spectrum, which can travel over greater distances without being deflected by obstacles. To the extent there are contiguous blocks of low- and mid-band spectrum available, these will not necessarily be able to keep up with the growing demand for data.⁴ Recently, the FCC has taken a series of actions to make more mid- and high-band spectrum available for 5G wireless broadband services.

1 Communications Act of 1934, Pub. L. 104–104, title I, § 104, Feb. 8, 1996 (codified at 47 U.S.C. § 151 *et seq.*)

2 National Telecommunications and Information Administration Organization Act, P.L. 102–538, Oct. 27, 1992, *as amended by* P.L. 115–141, Mar. 23, 2018 (codified at 47 U.S.C. § 901 *et seq.*)

3 Federal Communications Commission, *The FCC’s 5G Fast Plan*, accessible at <https://www.fcc.gov/5G> (last visited on July 11, 2019).

4 *Explaining 5G: Millimeter Wave, Sub-6, Low-Band and Other Terms You Need to Know*, AndroidCentral (Jul. 9, 2019) (accessible at <https://www.androidcentral.com/explaining-5g-millimeter-wave-sub-6-low-band-and-other-terms-you-need-know>).

A. 2.5 GHz/Educational Broadband Service (EBS)

In the 1970s, the FCC reserved some of the 2.5 spectrum Gigahertz (GHz) band for educational use, making certain channels available only to educational entities.⁵ Because these licenses were not widely claimed, the FCC has allowed EBS licensees to lease their excess capacity to commercial providers.⁶ In May 2018, the FCC proposed to provide new opportunities for entities to obtain unused 2.5 GHz spectrum for next generation wireless broadband without any education restrictions.⁷ Earlier this month, the FCC adopted new rules to make 2.5 GHz spectrum available to commercial entities and also established a priority filing window for rural Tribal Nations, to be followed by a public auction of any remaining unassigned spectrum.⁸

B. 3.5 GHz/Citizens Broadband Radio Service (CBRS)

In 2015, the FCC adopted rules for shared commercial use in the 3.5 GHz band, creating a three-tiered access and authorization framework for coordinating shared federal and non-federal use of the band.⁹ Incumbent users of the spectrum¹⁰ comprise the first tier and receive protection from all other users. Priority Access Licenses (PALs) comprise the second tier. These licenses are meant to be auctioned off for commercial use. The third tier is General Authorized Access (GAA), which will be allowed to operate throughout the 150 Megahertz (MHz) of the band on any frequencies not in use by PALs.¹¹ Subsequently, the FCC delayed implementation of the 2015 order in order to revise the rules governing PALs. The new rules adopted in 2017 require that PALs have larger license areas, longer license terms, renewability, and revised performance requirements. The FCC also made changes to the competitive bidding

⁵ *In the Matter of Amendment of Parts 2 and 74 of the Commission's Rules and Regulations to Establish a New Class of Educational Television Service for the Transmission of Instructional and Cultural Material to Multiple Receiving Locations on Channels in the 2500-2690 MHz Frequency Band, Amendment of Parts 81, 87, 89, 91, and 93*, Second Report and Order, 30 F.C.C.2d 197, 200 (Jun. 14, 1971), para. 12.

⁶ Federal Communications Commission, *In the Matter of Transforming the 2.5 GHz Band*, Notice of Proposed Rulemaking, WT Docket No. 18-120, FCC 18-59 (May 10, 2018), para. 4.

⁷ *See generally*, id.

⁸ Federal Communications Commission, *In the Matter of Transforming the 2.5 GHz Band, Public Draft Report and Order*, WT Docket No. 18-120, FCC-CIRC1907-XX (Jul. 10, 2019).

⁹ Federal Communications Commission, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015).

¹⁰ Id. at 3964-3967. Incumbents in the band are federal radiolocation users, Fixed Satellite Service earth stations, and certain grandfathered terrestrial wireless licensees.

¹¹ Federal Communications Commission, *In the Matter of Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, FCC 18-149 (Oct. 24, 2018), para. 3.

rules for the issuance of PALs, and to the ability to partition and disaggregate areas within PALs.¹² The auction has not yet been scheduled.

C. 3.7 GHz – 4.2 GHz/C-Band

The spectrum between 3.7 GHz and 4.2 GHz, commonly referred to as C-Band, is predominately used by satellite operators to deliver programming content to radio and TV broadcasters.¹³ The FCC proposed in July 2018 to transition some, or all, of the C-Band from satellite to terrestrial wireless broadband use.¹⁴ The FCC released in May 2019 a public notice seeking comment on their legal authority to employ different elements of the clearing mechanisms that it previously suggested, namely, the combination of market- and auction-based clearing mechanisms.¹⁵ This spectrum is considered to be particularly valuable for 5G because of its propagation characteristics.¹⁶

D. 24 GHz

The FCC held an auction for licenses in the 24 GHz band in March 2019,¹⁷ and the spectrum garnered more than \$2 billion with 29 bidders winning a total of almost 3,000 licenses. A question remains, however, regarding what interference level is appropriate to protect the adjacent band, which is used for weather forecasting sensors. As a general matter, NTIA is responsible for working with affected federal stakeholders and coordinating with the FCC to determine the appropriate interference level.¹⁸ For international matters, the Department of State

¹² Id. at para. 3.

¹³ Federal Communications Commission, *In the Matter of Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, FCC 18-91 (Jul. 13, 2018), para. 10.

¹⁴ See generally, id.

¹⁵ Federal Communications Commission, *International Bureau and Wireless Telecommunications Bureau Seek Focused Additional Comment in 3.7-4.2 GHz Band Proceeding*, Public Notice, GN Docket No. 18-122, RM-11791, RM-11778, DA 19-385 (May 2, 2019).

¹⁶ Federal Communications Commission, *In the Matter of Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, FCC 18-91 (Jul. 13, 2018), para. 5.

¹⁷ Federal Communications Commission, *Auction of 24 GHz Upper Microwave Flexible Use Service Licenses Closes, Winning Bidders Announced for Auction 102*, Public Notice, AU Docket No. 18-85, DA 19-485 (Jun. 3, 2019).

¹⁸ *Memorandum of Understanding Between the Federal Communications Commission and the National Telecommunications and Information Administration*, Sec. IV(5) (signed Jan. 31, 2003).

will also be involved.¹⁹ With respect to 24GHz, disagreement over the appropriate interference level has become a public debate.²⁰

E. Upper 37 GHz, 39 GHz, and 47 GHz

The FCC intends to begin an incentive auction on December 10, 2019, that will offer new flexible use licenses in the Upper 37 GHz, 39 GHz, and 47 GHz bands.²¹ The FCC expects this high-band spectrum to enhance opportunities for both incumbents and new entrants to provide 5G wireless, Internet of Things, and other advanced services.²² Because there are incumbents in the 39 GHz band, the incentive auction will allow incumbents to choose whether they would prefer to be moved to a spectral location or relinquish their spectrum entirely in exchange for incentive payments and the option to bid in the auction.²³

F. 6 GHz

The 6 GHz band is currently used for non-federal services, including public safety, coordination of railroad train movement, control of natural gas and oil pipelines, among others.²⁴ In October 2018, the FCC proposed expanding unlicensed use in the 6 GHz band.²⁵ Unlicensed devices that use Wi-Fi and other unlicensed standards can be used to provide low-cost wireless connectivity in consumer products.²⁶ The FCC has yet to complete the rulemaking.

¹⁹ Exec. Order No. 12,046, 43 FR 13349 (Oct. 21, 1977), *as reprinted in* 47 U.S.C. § 305 (note 5-2) (1996).

²⁰ *Ajit Pai Says NOAA and NASA Are Wrong About 5G Harming Weather Forecasts*, Ars Technica (Jun. 13, 2019) (accessible at <https://arstechnica.com/tech-policy/2019/06/ajit-pai-says-noaa-and-nasa-are-wrong-about-5g-harming-weather-forecasts>).

²¹ Federal Communications Commission, *Notice of Updated 39 GHz Reconfiguration Procedures, Preparation for Incentive Auction of Upper Microwave Flexible Use Services Licenses in the 37 GHz, 39 GHz, and 47 GHz Bands*, Order of Modification, GN Docket No. 14-177, AU Docket No. 19-59, DA 19-397 (May 14, 2019), para. 1.

²² *Id.*

²³ *Id.* at paras. 1-2.

²⁴ Federal Communications Commission, *In the Matter of Unlicensed Use of the 6 GHz Band and Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Proposed Rulemaking, ET Docket No. 18-295, GN Docket No. 17-183, FCC 18-147 (Oct. 24, 2018), para. 9.

²⁵ Federal Communications Commission, *In the Matter of Unlicensed Use of the 6 GHz Band and Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Proposed Rulemaking, ET Docket No. 18-295, GN Docket No. 17-183, FCC 18-147 (Oct. 24, 2018), para. 9.

²⁶ *Id.* at para. 1.

G. 470 – 512 MHz/T-Band

In 1970, the FCC granted public safety entities and business-industrial users in 11 major U.S. metropolitan areas access to certain portions of the spectrum between 470 MHz and 512 MHz, commonly referred to as the T-Band, on a shared basis with incumbent TV broadcast users.²⁷ Since 1971, local and regional public safety and law enforcement entities have built out radio and data communications systems that today serve a combined population of more than 90 million Americans.²⁸

As part of the Middle Class Tax Relief and Job Creation Act of 2012, Congress directed the FCC to reallocate the T-Band spectrum used by public safety entities for commercial use.²⁹ The FCC is required to commence auctioning T-Band spectrum by February 2021 and clear all public safety operations from the band by early 2023.³⁰ Proceeds from the auction would then go toward covering relocation costs imposed on displaced public safety users through a grant program administered by the NTIA.³¹ According to a June 2019 Government Accountability Office report, however, FCC officials estimate that revenues from auctioning the entire T-Band would not exceed \$2 billion, while the costs associated with relocating the incumbent public safety users are estimated to reach roughly \$5 to \$6 billion.³²

²⁷ Federal Communications Commission, *Amendment of Parts 2, 89, 91, and 93, First Report and Order*, Docket No. 18261, 23 FCC 2d 325 (1970). The 11 major metro areas utilizing the T-Band are: New York City, Los Angeles, Chicago, Washington/Baltimore, Philadelphia, San Francisco, Boston, Dallas/Fort Worth, Houston, Miami, and Pittsburgh.

²⁸ See National Public Safety Telecommunications Council, *T-Band Update Report* (May 2016).

²⁹ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 1603 (codified at 47 U.S.C. § 1413).

³⁰ See National Public Safety Telecommunications Council, *T-Band Report* (Mar. 2013).

³¹ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 1603 (codified at 47 U.S.C. § 1413).

³² Government Accountability Office, *Emergency Communications: Required Auction of Public Safety Spectrum Could Harm First Responder Capabilities* (Jun. 2019) (GAO-19-508).

II. WITNESSES

The following witnesses have been invited to testify:

Panel I

Julius P. Knapp

Chief, Office of Engineering and Technology
Federal Communications Commission

Derek Khlopin

Senior Policy Advisor
National Telecommunications and Information Administration

Panel II

Tim Donovan

Senior Vice President, Legislative Affairs
Competitive Carriers Association

Peter Pitsch

Head of Advocacy & Government Relations
C-Band Alliance

Scott Bergman

Senior Vice President, Legislative Affairs
CTIA

Michael Calabrese

Open Technology Institute

Mariel Triggs

Chief Executive Officer
MuralNet

Jeffrey S. Cohen

Chief Counsel
APCO International