

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

In the Matter of)	
)	
Use of Spectrum Bands Above 24 GHz for)	GN Docket No. 14-177
Mobile Radio Services)	
)	
Wireless Telecommunications Bureau and)	
Office of Engineering and Technology Establish)	GN Docket No. 15-319
Procedure and Deadline for Filing Spectrum)	
Access System (SAS) Administrator(s) and)	
Environmental Sensing Capability (ESC))	
Operator(s) Applications)	
)	
Expanding Flexible Use in Mid-Band Spectrum)	GN Docket No. 17-183
Between 3.7 and 24 GHz)	
)	
Promoting Investment in the 3550-3700 MHz)	GN Docket No. 17-258
Band)	
)	

COMMENTS OF WI-FI ALLIANCE

Wi-Fi Alliance^{1/} submits these comments in response to the Public Notice issued in the above reference proceedings by the Wireless Telecommunications Bureau and Office of Engineering and Technology^{2/} seeking input on reports that the Commission is required to

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^{2/} *Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment Pursuant to the Spectrum Pipeline Act of 2015*, Public Notice, DA 18-841, GN Docket Nos. 14-177, 15-319, 17-183, 17-258 (rel. Aug. 10, 2018) (“Public Notice”).

submit to Congress by the Spectrum Pipeline Act of 2015.^{3/} One of the reports that the Commission is required to submit – on additional spectrum bands that can be shared between incumbent uses and new licensed and unlicensed services between 6 GHz and 57 GHz (the “Report”) – covers a topic critical to Wi-Fi Alliance; unlicensed access to the 5.925-7.125 (“6 GHz”) band. Wi-Fi Alliance therefore welcomes the opportunity to assist in the preparation of the Report.

Wi-Fi Alliance is a global, non-profit industry association of over 800 leading companies from dozens of countries devoted to connecting everyone and everything everywhere. With technology development, market building, and regulatory programs, Wi-Fi Alliance has enabled widespread adoption of Wi-Fi® worldwide, certifying thousands of Wi-Fi products each year. Certified, interoperable Wi-Fi systems are critical to the nation’s wireless ecosystem, and are key components of the country’s economic growth and catalysts for technological innovation. The mission of Wi-Fi Alliance is to provide a highly effective collaboration forum for Wi-Fi matters, grow the Wi-Fi industry, lead industry growth with new technology specifications and programs, support industry-agreed standards, and deliver greater product connectivity through interoperability, testing, and certification.

Congress acted appropriately in 2015 to require that the Commission actively consider making additional spectrum available for unlicensed operations like Wi-Fi.^{4/} Congress has recently correctly reiterated the importance of unlicensed spectrum and provided even more

^{3/} Spectrum Pipeline Act of 2015, Pub. L. No. 114-74, § 1008, 129 Stat. 621, 625 (2015) (“Spectrum Pipeline Act”).

^{4/} See *Spectrum Pipeline Act* § 1006(a)(3) (requiring the Commission report to Congress on balancing unlicensed and licensed uses of cleared spectrum).

specific direction to the Commission to make more unlicensed spectrum available.^{5/} As Wi-Fi Alliance has emphasized, unlicensed devices, particularly those using Wi-Fi protocols, are a major economic engine, carrying the majority of the country's Internet traffic and enabling exciting use-cases for consumers, industry, and government.^{6/}

Wi-Fi Alliance and its members continue to drive the technological development that will make Wi-Fi even better at serving these needs. Devices that use the latest generation Wi-Fi protocols – 802.11ax – are being announced even as the standard is completed. These devices maximize spectrum utilization, by implementing wider channel bandwidths to deliver required broadband connectivity.^{7/} While new Wi-Fi devices are being introduced in the 5 GHz band,

^{5/} See, *Consolidated Appropriations Act 2018*, Pub. L. No. 115-141, div. P, tit. VI, § 603 (requiring the Commission to identify a minimum of 100 megahertz of spectrum below 8 GHz for unlicensed operation by 2022); § 611 (requiring the Commission to evaluate unlicensed operations in guard bands); § 617 (making the promotion of unlicensed spectrum the official policy of the United States and charging the Commission with making unlicensed spectrum a priority); and § 618 (requiring the Commission to work with NTIA to draft a “National Plan for Unlicensed Spectrum” by September 23, 2020 which will lead to increased unlicensed spectrum access). See also, Letter from Ben Guthrie and Doris Matsui, Co-Chairs, Congressional Spectrum Caucus to Ajit Pai, Chairman, Federal Communications Commission, July 11, 2018 and Letter from John Thune, Chairman, Senate Committee on Commerce, Science and Transportation to Ajit Pai, Chairman, Federal Communications Commission, June 29, 2018.

^{6/} See *Opposition of Wi-Fi Alliance*, RM-11808 at 5 (filed Jul. 6, 2018) (“Wi-Fi is now the gateway for over half of Internet access...Wi-Fi continues to be a critical component of U.S. wireless broadband infrastructure: it is the predominant on- and off-ramp for Internet access from U.S. homes and businesses...In short, ensuring that there is sufficient spectrum for Wi-Fi to meet dramatically expanding demand is in the public interest”); *Comments of Wi-Fi Alliance*, GN Docket No. 17-183 at 3 (filed Oct. 2, 2017) (“[Wi-Fi] supports a significant portion of wireless carrier’s network traffic through offload... and it is, and will be, an important part of the Internet of Things architecture.”) (“*WFA Mid-Band Comments*”); *Comments of Wi-Fi Alliance*, GN Docket No. 14-177 *et al.* at 4 (filed Sept. 30, 2016) (“International standards organizations are actively developing use cases for the next generation of WiGig, such as the mobile use of high-end augmented or virtual reality headsets and other wearables, backup inter-rack connectivity for data centers, and mass video or data distribution to devices in classrooms, exhibition halls, or airplane or train cabins”).

^{7/} In addition to developing devices that take advantage of new protocols, the industry is working to ensure that those devices are secure. In June, 2018, Wi-Fi Alliance announced the introduction of Wi-Fi CERTIFIED WPA3™. See, Wi-Fi Alliance, *Wi-Fi Alliance® introduces Wi-Fi CERTIFIED WPA3™ security*, News Release, Jun. 25, 2018.

which is available for unlicensed operations, more mid-band spectrum is needed to meet the growing demand for data throughput capabilities offered by the next generation Wi-Fi. This spectrum shortfall has yet to be addressed by the Commission.^{8/}

Members of the Commission have recognized those needs,^{9/} and it has recently initiated a proceeding that may result in the designation of additional spectrum for unlicensed operations like Wi-Fi.^{10/} Therefore, in its report to Congress, the Commission should note the initial steps it has taken, but also outline its plan to issue final rules that will enable unlicensed access to much needed spectrum.

Wi-Fi Alliance is encouraged by Chairman Pai's statement that he intends to circulate a Notice of Proposed Rulemaking ("NPRM") taking the next steps in "opening up the 6 GHz band to unlicensed use this fall,"^{11/} and by indications of support for such an NPRM from

^{8/} See *WFA Mid-Band Comments* at 3-4 ("It has been nearly 20 years since a significant amount of mid-band spectrum has been made available for unlicensed operations – during which time the number of devices and applications relying on this spectrum has grown exponentially.") (citing to Wi-Fi Alliance, *Spectrum Needs Study* at p. 23, Feb. 2017, available at <https://www.wifi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy0.pdf/33364> (showing up to 1500 megahertz of additional mid-band spectrum may be needed to alleviate this spectrum shortfall).

^{9/} See e.g., Michael O'Rielly, *This is World Wi-Fi Day, let's celebrate the progress we've made*, THE HILL (June 19, 2017) <http://thehill.com/blogs/pundits-blog/technology/338358-this-world-wi-fi-day-lets-celebrate-the-progress-weve-made> ("To say that Wi-Fi is a critical component of Internet access in today's always-connected society doesn't do it justice. . . . But more needs to be done to promote future opportunities. This includes making more spectrum bands available for unlicensed use to allow super-wide Wi-Fi channels."); Statement of Commissioner Rosenworcel before the House Subcommittee on Communications and Technology, Mar. 22, 2016 ("Before we overwhelm Wi-Fi as we know it, we need more efforts to secure more unlicensed spectrum."); *Statement of Commissioner Ajit Pai, In Re Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands* FCC 15-99 (Aug. 11, 2015) ("I am a big proponent of making more spectrum available for unlicensed use").

^{10/} *In the Matter of Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183 (rel. Aug. 3, 2017) ("NOI").

^{11/} Letter from Ajit Pai, Chairman, Federal Communications Commission to John Thune, Chairman, Senate Committee on Commerce, Science, and Transportation, August 10, 2018 ("That's why I have announced that the Commission will be moving forward with a rulemaking to consider opening up the 6 GHz band to unlicensed use this fall.") See also Ajit Pai, Chairman, Federal Communications

Commissioner O’Rielly.^{12/} Wi-Fi Alliance is hopeful that, in its Report, the Commission will be in the position to confirm that it has *already* issued the NPRM. In any case, the Commission should commit to a timeframe for adopting final rules governing unlicensed operations in the 6 GHz band. Such a commitment, preferably within 2019 timeframe, would allow Congress, industry and the American consumers to plan for future technological developments in the 6 GHz band.

As part of this Report, the Commission should explain that access to the 6 GHz by unlicensed devices is critical for Wi-Fi to achieve its full potential to connect Americans, drive innovation and economic growth. It should note that opening the 6 GHz band is essential to alleviating the existing unlicensed “spectrum crunch” and that this spectrum is *uniquely* suited to support the capacity needs of unlicensed devices, based on infrastructure and equipment development and deployment realities. While other bands may prove useful in the future, none are a substitute for the 6 GHz band now.

More broadly, the Commission should report the significant need for additional spectrum capacity for unlicensed devices and that it will continue to evaluate opportunities to make unlicensed spectrum available, especially in mid-band spectrum. These efforts are particularly important because the long-expected additional spectrum for Wi-Fi in the 5 GHz band has not materialized. Recent NTIA action foreclosing unlicensed operations in the 5.35-5.47 GHz (UNII-2B) band significantly disrupted Wi-Fi industry plans to accommodate growing demand

Commission, *Scoring a Victory for 5G*, FCC Blog Post, Jun. 20, 2018, available at <https://www.fcc.gov/news-events/blog/2018/06/20/scoring-victory-5g>.

^{12/} *Remarks of FCC Commissioner Michael O’Rielly Before the American Enterprise Institute*, Apr. 19, 2018.

in the mid-band spectrum.^{13/} Although Wi-Fi Alliance has urged, and continues to urge, the Commission to make the 5.850-5.925 GHz (U-NII-4) band available for unlicensed operations, its future remains uncertain.^{14/} But making the 6 GHz band available for unlicensed devices can be different. There has already been meaningful work on incumbent protection in the 6 GHz band,^{15/} which has created a clearer path to shared use of the band and adoption of a Report and Order enabling that shared use in 2019.

Wi-Fi Alliance supports the efforts of Congress and the Commission to ensure the availability of critically-needed unlicensed spectrum to allow the further development of key technologies like Wi-Fi. The Spectrum Pipeline report is an important component of this effort, and Wi-Fi Alliance urges the Commission to incorporate the suggestions above in its Report.

Respectfully submitted,

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^{13/} *NOI* at ¶ 28.

^{14/} The Commission's testing for U-NII-4 Devices to determine compatibility with Dedicated Short Range Communications systems on automobiles remains ongoing. See, *Office of Engineering and Technology Announces Schedule for Testing Prototype U-NII-4 Devices*, Public Notice (rel. Oct. 7, 2016).

^{15/} See Letter from Paul Margie, Counsel to Apple Inc., Broadcom Corporation, Facebook, Inc., Hewlett Packard Enterprise, and Microsoft Corporation to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 17-183, Jan. 25, 2018 (providing an engineering study by RKF Engineering concluding that unlicensed devices can operate in the 6 GHz band without causing harmful interference to incumbents). Notably, the primary incumbent concerned with interference issues has recognized that some form of automated frequency coordination will protect incumbent operations. See attachment to Letter from Cheng-yi Liu, Counsel for the Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 17-183, Jul. 17, 2018 ("*FWCC Letter*") at 13-16.

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