10900-B Stonelake Boulevard, Suite 126 · Austin, Texas 78759 U.S.A.
Phone: +1-512-498-9434 (WIFI) · Fax: +1-512-498-9435
www.wi-fi.org

June 28, 2021

VIA ELECTRONIC FILING
Radio.Spectrum@mbie.govt.nz

Planning for WLAN use in the 6 GHz band
Radio Spectrum Management Policy and Planning
Ministry of Business, Innovation and Employment
PO Box 2847
WELLINGTON 6140

Re: Consultation Submission - WLAN use in the 6 GHz band

Dear Colleagues,

Wi-Fi Alliance commends the New Zealand Ministry of Business, Innovation and Employment, Radio Spectrum Management (the "RSM") on its ongoing work in the area of spectrum management. The WLAN Use of the 6 GHz Band Discussion Document ("*Discussion Document*")[1/] is a critical tool to inform the public of the areas in which the RSM expects to focus and to solicit feedback that will provide the RSM with the information necessary to proceed. Wi-Fi Alliance applauds RSM for recognizing essential role Wi-Fi technology plays in delivering wireless connectivity to consumers and enterprises in New Zealand.[2/] In light of that, Wi-Fi Alliance urges the RSM to ensure the future of Wi-Fi functionality by making much needed spectrum access available for the use through the General User Radio Licence for Short Range Devices ((GURL-SRD) to cover the use of low power and very lower power WLAN devices.in the 5925–7125 MHz band.

Introduction

Wi-Fi Alliance is a global, non-profit industry association of over 850 leading companies from dozens of countries devoted to seamless interoperability. 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. Radio Local Area Network systems (RLANs) using Wi-Fi standards have become increasingly important in connecting people and devices. Hundreds of millions of people rely on Wi-Fi to connect billions of devices every day, and studies show this is increasing rapidly.[3/] Devices using spectrum that supports Wi-Fi are now the primary means by which New Zealanders connects to the Internet. This central role will only increase in the future, since Wi-Fi technology will be an essential complement to Fifth Generation wireless ("5G") networks, as highlighted by the recently released Cisco VNI Mobile Report

---

1/ The Ministry's Radio Spectrum Management (RSM) WLAN use in the 6 GHz band discussion document, June 2021 ("*Discussion Document*") available at: https://www.rsm.govt.nz/assets/Uploads/documents/consultations/2021-wlan/wlan-use-in-the-6-ghz-band-discussion-document.pdf .

2/ *Discussion Document* at 3.

3/ *See Wi-Fi Celebrates 20 Years with More Than 20 Billion Anticipated Device Shipments over the Next Six Years*, ABI Research (Jun. 13, 2019) available at: https://www.abiresearch.com/press/wi-fi-celebrates-20-years-more-20-billion-anticipated-device-shipments-over-next-six-years/

showing that traffic offloaded to Wi-Fi increase with each successive technology generation.[4/] Dramatic growth in a number of active Wi-Fi devices and data traffic volumes require additional spectrum capacity than what is currently unavailable under the GURL-SRD provisions.[5/] Wi-Fi Alliance's previously released *Spectrum Needs Study*[6/] demonstrates that significantly more spectrum access is required to meet expanding connectivity needs.

Importantly, the connectivity provided by Wi-Fi through low-cost GURL-SRDs delivers billions of dollars in value to the New Zealand's economy. Indeed, the economic value generated by Wi-Fi connectivity in New Zealand is estimated to exceed NZ$9.7 billion in 2021 and increase to NZ$13.8 billion by 2025.[7/]

Wi-Fi Alliance Responses to the *Discussion Paper* Issues[8/]

Q1. Do you agree with RSM's proposal on making the 5925 - 6425 MHz available for WLAN use?
Q2. What are your views on the potential future use of 6425 - 7125 MHz for new applications (e.g. Wi-Fi or IMT)?

Answer to Q1and Q2: The *Discussion Document* comes at a pivotal time in the development the Wi-Fi ecosystem. Earlier this year, Wi-Fi Alliance introduced new Wi-Fi 6E terminology to distinguish the latest generation Wi-Fi 6 devices that are capable of 6 GHz operation.[9/] Wi-Fi 6E brings a common industry name for Wi-Fi users to identify devices that offer the features and capabilities of Wi-Fi 6 – including higher performance, lower latency, and faster data rates – extended into the 5925–7125 MHz band. Wi-Fi 6E devices are quickly becoming available, following regulatory approvals in several countries. As the 6 GHz regulatory landscape evolves, Wi-Fi Alliance member companies are expanding the Wi-Fi 6E ecosystem even further.[10/] The first Wi-Fi devices to use the 5925-7125 MHz band include Wi-Fi 6E consumer access points and smartphones, followed by enterprise-grade access points. Industrial environments are also expected to see strong adoption of Wi-Fi 6E to deliver applications including machine analytics, remote maintenance, or virtual employee training. Wi-Fi 6E will utilize 6 GHz to deliver much anticipated AR/VR use cases for consumer, enterprise, and industrial environments. The list of Wi-Fi 6E certified products is growing.[11/] In 2021, over 300 million Wi-Fi 6E devices are expected to enter the market.[12/] Prompt RSM action to ensure regulatory harmonization in the 5925–7125 MHz band will create economies of scope and scale and produce a robust equipment market, benefitting New Zealand's businesses, consumers, and the economy.

4/ Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2017–2022**,** White Paper at page 18, available at https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.pdf

5/ *Discussion Document* at 3.

6/ Wi-Fi Alliance, *Spectrum Needs Study* at p. 23, Feb. 2017, available at https://www.wi-fi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy_0.pdf/33364

7/ *Discussion Paper* at Table 1.

8/ *Discussion Paper* at 3.

9/ *See* Wi-Fi Alliance® brings Wi-Fi 6 into 6 GHz, WI-FI ALLIANCE (Jan. 3, 2020) *https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-brings-wi-fi-6-into-6-ghz.*

10/ See Product Finder, WI-FI ALLIANCE (last visited on Feb. 22, 2021) https://www.wi-fi.org/product-finder-results?sort_by=certified&sort_order=desc&certifications=1335.

11/ *See Product Finder,* WI-FI ALLIANCE (last visited on Feb. 22, 2021) https://www.wi-fi.org/product-finder-results?sort_by=default&sort_order=desc&certifications=1275; *see also* Wi-Fi 6E: Expanding Wi-Fi into 6 GHz spectrum (English), Video, Wi-Fi Alliance (Jan. 6, 2021) https://www.youtube.com/watch?v=oOZLhkaehzU.

12/ *See* Wi-Fi 6E: The Market Opportunity for Wi-Fi 6 in the 6GHz Spectrum Band, IDC Market Presentation (Apr. 2020) https://www.idc.com/getdoc.jsp?containerId=US46220720.

Access to less than the entire 5925-7125 MHz band (1200 MHz) for license-exempt use would substantively reduce Wi-Fi 6E performance in terms of latency and data throughput. The 5925-6425 MHz band (500 MHz) does not provide sufficient spectrum to accommodate channel diversity needed to support Wi--Fi connectivity particularly in high-density user environments. And there are no alternative frequency bands that may accommodate expanding Wi-Fi spectrum requirements in the future. Wi-Fi Alliance respectfully asks the RSM to note that the 5925-7125 MHz band is uniquely suited to accommodate the urgent need for additional Wi-Fi spectrum access for the following reasons:

- Self-coordinating, multi-channel Wi-Fi networks relying on dynamic random spectrum access and contention-based protocols require access to multiple channels to maintain acceptable performance. The current Wi-Fi standard (IEEE 802.11ax, Wi-Fi 6/6E) specifies channel bandwidths of up to 160 MHz, while the next amendment under consideration (Extremely High Throughput, Wi-Fi 7.[13/]) will specify channel bandwidths of up to 320 MHz. The 500 MHz is simply insufficient to accommodate multiple 320 MHz channels.
- Access to 1200 MHz will enable new technologies, innovations and improvements in wireless connectivity. Contiguous spectrum would allow for wider, non-overlapping Wi-Fi channels with harmonized technical conditions. With access to 1200 MHz of contiguous spectrum (i.e., 5925-7125 MHz, 14 additional 80 MHz channels, 7 additional 160 MHz channels or 3 additional 320 MHz channels can be enabled to support high-bandwidth applications that require faster data throughput and lower latency such as high-definition video streaming and virtual reality. Wi-Fi 6E and subsequent generations of Wi-Fi technology will leverage these wider channels and additional capacity to deliver greater network performance and support more Wi-Fi users at once, even in very dense and congested environments.
- Existing Wi-Fi equipment designed for the 5 GHz band can be rapidly adapted and deployed in the 5925-7125 MHz band offering significant economies of scale and other benefits.
- Efforts to enable Wi-Fi in the 5925-7125 MHz band are already underway in many countries. While European regulators completed the initial step of opening the 5925-6425 MHz band (lower 6 GHz band) for licence-exempt use, there is broad recognition that a follow-up action is needed to address the projected demand for Wi-Fi spectrum in the 6425-7125 MHz.

Wi-Fi Alliance agrees that introduction of new GURL-SRD applications must not disrupt or constrain important incumbent operations in the 5925-7125 MHz frequency band. Authorization of the GURL-SRD (e.g., Wi-Fi) in the 5925-7125 MHz frequency band is feasible and the best use of this valuable spectrum resource. Built on IEEE 802.11 standards, Wi-Fi has demonstrated its ability to coexist with and protect other spectrum users. These protections are inherent to Wi-Fi technology and are critical to its efficient operations on unlicensed basis worldwide. And Wi-Fi industry is committed to implementing technical, operational, and regulatory solutions that ensure coexistence with current and future users in the 5925-7125 MHz band. Extensive technical analyses conducted in Europe and US confirm the feasibility of RLAN operations in the in the 5925-7125 MHz frequency band without interference to the incumbent services. These regulatory solutions are viable for Wi-Fi 6E implementations but are not practical for commercial IMT networks. Commercially viable IMT deployments require exclusive access to spectrum. IMT networks cannot accept interference from or avoid causing interference to the incumbent operations in the 6425-7125 MHz band. It is, therefore, unrealistic to expect that ubiquitously deployed IMT networks can avoid interfering with and tolerate interference from other, incumbent operations in the 6425-7125 MHz band. Relocation of incumbents to another frequency band, even if a frequency band is available, may not be economically viable and would require extensive transition periods (e.g., years).

13/ *See* Wi-Fi 7: https://www.wi-fi.org/who-we-are/current-work-areas#Wi-Fi%207

As noted in the *Discussion Document*, countries recognize the unique benefits of the 6 GHz spectrum for RLAN deployments. [14/] A number of countries already decided to allow Wi-Fi access to the 5925-7125 MHz spectrum to support rapidly growing demand for gigabit connectivity, including Brazil, Canada, Mexico, Saudi Arabia, South Korea, US and others.

Q3. Do you agree that RSM should include 5925 - 6425 MHz in the GURL-SRD for WLAN low power indoor and very low power use?

Answer to Q3 and Q4: Noting the concern that 500 MHz does not offer sufficient spectrum to support rapidly growing demand for Wi--Fi connectivity, Wi-Fi Alliance recommends allowing the GURL-SRD operations at low-power indoor ("LPI") at a limit of 30 dBm and 11 dBm/MHz, or in any location at a 'very low power' ("VLP") limit of 17 dBm and 1 dBm/MHz. These higher power levels would facilitate consistent performance for wider channel of up to 320 MHz, advance the rapidly evolving Wi-Fi 6E ecosystem and enable implementation of new use cases in healthcare, wearables, IoT and other sectors. The RSM also should note that in case of LPI GURL-SRDs, higher power levels are necessary to support Wi-Fi 6E enhanced data throughput capabilities to reach beyond one or two rooms without the need for signal extenders or additional equipment. And the GURL-SRD VLP devices are largely personal network devices that are operated primarily indoors where they have even lower interference potential than the low-power indoor GURL-SRDs. Importantly, these recommended power limits would be consistent with the regulations adopted by other administrations.[15/]

Also, to derive most benefit and maximize harmonization, the RSM should permit low-power indoor GURL-SRDs client devices to communicate directly with other low-power indoor GURL-SRDs client devices (i.e., client-to-client), not just with access points. Client-to-client connectivity supports a number of important use cases including onboarding equipment using smartphones, sharing streaming video from one device to another, and sharing files among users or devices quickly and efficiently. That is why the European regulators adopted rules that permit client-to-client connectivity [16/] while similar rules are under consideration in the U.S. [17/]

Q4. Do you agree that RSM should mandate ETSI EN 303 687 as the radio standard for WLAN use in the 6 GHz band? Is there any other regulatory compliance standard we should consider?

Wi-Fi Alliance contributed to the development of ETSI EN 303 687 and supports this standard. The RSM should note however that the U.S. Federal Communications Commission ("FCC") already initiated regulatory

---

[14/] *Discussion Document* at 6-8.

[15/] FCC published Report and Order (FCC-20-51) ¶ 18 and 47 CFR.§ 15.407 (5). *Also see*, Brazil ANATEL Act No. 1306, 26 February 2021 at ¶ 11.7.1.1 and at ¶ 11.7.3.1 available at https://sei.anatel.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?eEP-wqk1skrd8hSlk5Z3rN4EVg9uLJqrLYJw_9INcO7uvjUt3vSOwT_4Z5fukj9yIzPErY4KWH5cpE9W_9hcTZkCG-vLPIdpXyuhgMG-L9M-uBLoSdAAXO0clb3SIt1i

[16/] ECC Decision (20)01 On the harmonized use of the frequency bands 5945 to 6425 MHz for implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) at Table 1 on Pg. 6 available at https://docdb.cept.org/download/50365191-a99d/ECC%20Decision%20(20)01.pdf

[17/] *The Office Of Engineering & Technology Seeks Additional Information Regarding Client-to-Client Device Communications in the 6 GHz Band*, Public Notice, ET Docket No. 18-295 and GN Docket No. 17-183, DA 21-7 (Jan. 11, 2021) ("*6 GHz Public Notice*"), available at https://www.fcc.gov/document/oet-seeks-info-6-ghz-u-nii-client-client-device-communications

certification of unlicensed devices operating in the 5925-7125 MHz band.[18/] As explained above, harmonization of the applicable regulatory frameworks and standards will create economies of scope and scale and produce a robust equipment market, benefitting New Zealand's businesses, consumers, and the economy.

Q5. What are your views on using a licensing approach to support 30 dBm EIRP WLAN devices?

Q6. What are your views on supporting 36 dBm EIRP standard power devices using Automatic Frequency Coordination (AFC) system? Do you have any proposals to provide AFC systems to New Zealand?

Answer to Q5 and Q6: The need for Wi-Fi enabled outdoor connectivity is significant and growing. Recognizing the important role that standard-power devices can play in closing the digital divide by providing ubiquitous connectivity in underserved areas, Wi-Fi Alliance urges RSM to allow GURL-SRDs outdoor deployments in to the 5925-7125 MHz band. For example, the Wi-Fi outdoor deployments are needed to deliver connectivity to:

- Remote and underserved areas,
- Smart cities and communities;[19]
- Mobile Data – volume of mobile data traffic offloaded to Wi-Fi significantly exceeds traffic carried (remaining) on cellular networks;[20]
- Locations which are increasingly expected to offer ubiquitous Wi-Fi access including outdoor areas such as sports arenas, municipal/private networks, parks, and other high traffic areas as well as indoor areas such as shopping malls, airports, hotels, restaurants, office buildings and schools;
- Sensors and connectivity for public transport, automotive, utilities, etc.
- Internet of Things (IoT) technologies entail both indoor and outdoor deployments;
- Connected wearables and other consumer applications rely on Wi-Fi to support various use cases.

Regulatory alignment between New Zealand, Canada, U.S. and other countries will facilitate development and deployment of the AFC systems by leveraging the ecosystem built for the broader market. Currently, Wi-Fi Alliance and other industry organizations are actively developing technical specifications to enable AFC implementation. [21/] And the RSM should preserve flexibility to foster a vibrant AFC ecosystem to enable continued innovation that will lead to increased competition and lower costs for the consumers.

The AFC system approach ensures protection of incumbents while allowing this valuable spectrum resource to be used more efficiently by the low-cost GURL-SRDs to extend broadband coverage. Wi-Fi Alliance recognizes that the 6 GHz incumbent service deployments are not static, and the AFC systems will be designed to accommodate updates to account for possible changes in the 6 GHz incumbent operations.

Also, RSM should consider allowing standard-power access points to operate at levels higher than 36 dBm EIRP. This allowance would provide wireless internet service providers additional flexibility needed to

---

18/ *See* Part 15 Subpart E U-NII 6 GHz General Guidance Bands 5, 6, 7, 8, KDB 987594, Office of Engineering and Technology Knowledge Database (Feb. 4, 2021) https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?id=277034&switch=P .

19 *See* https://www.itu.int/en/ITU-T/ssc/Pages/default.aspx

20 *See* https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.html

21/ *See* https://www.wi-fi.org/downloads-registered-guest/AFC_System_to_AFC_Device_Interface_Specification_V1.0_0.pdf/37459 .

relieve congestion in the 5 GHz band and extend the Wi-Fi connectivity success to the 6 GHz band. To ensure that higher EIRP levels are used primarily for point-to-point operations, RSM may specify a limit on the maximum conducted transmitter power (e.g., 30 dBm) and allow standard power point-to-point GURL-SRDs to employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power, thereby encouraging the use of higher gain, highly directional antennas.

Conclusion

Policymakers worldwide recognize that broadband connectivity is increasingly dependent on GURL-SRD technologies such as Wi-Fi. And this *Discussion Document* represents an important step toward making much-needed spectrum capacity available for GURL-SRD operations in New Zealand. Wi-Fi Alliance appreciates the opportunity to contribute to the Ministry's RSM efforts.

Respectfully submitted,

/s/ Alex Roytblat

WI-FI ALLIANCE
Alex Roytblat
Vice President of Regulatory Affairs
aroytblat@wi-fi.org