

BEFORE INDUSTRY CANADA

IN THE MATTER OF

**CANADA GAZETTE, PART 1, NOTICE NO. SMSE-002-17-
CONSULTATION ON THE TECHNICAL AND POLICY FRAMEWORK FOR RADIO
LOCAL AREA NETWORK DEVICES OPERATING IN THE BAND 5150-5250 MHZ**

COMMENTS OF WI-FI ALLIANCE



29 MARCH 2017

1.0 INTRODUCTION AND BACKGROUND

1.1 On January 19, 2017, Innovation, Science and Economic Development Canada (“ISED” or the “Department”) issued Notice No. SMSE-002-17 seeking input on whether to modify the current technical and policy framework for radio local area network (“RLAN”) devices operating in the 5150-5250 MHz band.^{1/} Wi-Fi Alliance®^{2/} applauds the ISED’s efforts to make the 5150-5250 MHz band more productive and supports the proposal to allow higher power and outdoor RLAN devices (“HPODs”) to operate in the band.

1.2 Wi-Fi Alliance is a global, non-profit industry association of over 700 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. 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.

1.3 Wi-Fi Alliance has participated in important efforts to expand the spectrum resources available for unlicensed operations, including opening up portions of the 5 GHz band for

^{1/} *Notice No. SMSE 002-17 – Consultation on the Technical and Policy Framework for Radio Local Area Network Devices Operating in the 5150-5250 MHz Frequency Band, Canada Gazette, (Jan. 28, 2017) (“5 GHz Notice”).*

^{2/} Wi-Fi®, the Wi-Fi logo, the Wi-Fi CERTIFIED logo, Wi-Fi Protected Access® (WPA), WiGig®, the Wi-Fi ZONE logo, the Wi-Fi Protected Setup logo, Wi-Fi Direct®, Wi-Fi Alliance®, WMM®, and Miracast® are registered trademarks of Wi-Fi Alliance. Wi-Fi CERTIFIED™, Wi-Fi Protected Setup™, Wi-Fi Multimedia™, WPA2™, Wi-Fi CERTIFIED Passpoint™, Passpoint™, Wi-Fi CERTIFIED Miracast™, Wi-Fi ZONE™, WiGig CERTIFIED™, Wi-Fi Aware™, Wi-Fi HaLow™, the Wi-Fi Alliance logo and the WiGig CERTIFIED logo are trademarks of Wi-Fi Alliance.

unlicensed devices, in the United States, India, Australia, and elsewhere.^{3/} Today, the 5150-5250 MHz band has primary allocations for radionavigation, the fixed-satellite service, and the mobile-satellite and mobile services. It is currently only used for fixed-satellite and mobile-satellite operations operated by Globalstar, the Canadian Space Agency, and the Department of National Defence.^{4/}

1.4 The Department is considering three alternatives to regulating the 5150-5250 MHz band and, in order to inform its evaluation of those options, it asks three questions.^{5/} Wi-Fi Alliance is pleased to have the opportunity to address those questions here.

2.0 QUESTION A: THE DEMAND FOR AND BENEFIT, IF ANY, OF ALLOWING HPODS IN THE 5150-5250 MHZ FREQUENCY BAND BEFORE WRC-19.

2.1 As the Department has acknowledged, research indicates that public and home Wi-Fi hotspots in Canada alone will grow from 0.8 million to 10.2 million between 2015 and 2020, representing a 13-fold increase.^{6/} Similarly, studies conducted by Cisco show that Wi-Fi continues to be one of the fastest growing elements of the wireless market: in 2015, global Wi-Fi traffic was 55.2% of Internet traffic, and it will be 59.1% of total Internet traffic in 2020, meaning that, with increases in total Internet traffic, in three years Wi-Fi networks will be

^{3/} See *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, 29 FCC Rcd. 4127 (2014) ("5 GHz FCC Order"); Comments of Wi-Fi Alliance in response to *Consultation Paper on Proliferation of Broadband Through Wi-Fi Networks*, Consultation Paper No. 14/2016 (2016); Comments of Wi-Fi Alliance in response to *Five Year Spectrum Outlook 2016-20, The ACMA's spectrum management work program*, October 2016.

^{4/} 5 GHz Notice at ¶ 12-15.

^{5/} *Id.* at ¶ 20-29.

^{6/} *Id.* at ¶ 20.

carrying three times as much content as they were in 2015.^{7/} In Canada specifically, Wi-Fi traffic is expected to grow at an annual rate of 10%, meaning from 2015 to 2020, it will go from 58% of Internet traffic to being 65%, with total traffic again growing threefold during that period.^{8/}

2.2 Part of this increase comes from the growth of Internet of Things (“IoT”) applications, such as connected appliances, smart meters, and wearables. Studies estimate that the overall investment in IoT in the next few years will be in the tens of billions of dollars, with the number of devices doubling between 2015 and 2020.^{9/} Recognizing the value of Wi-Fi for IoT devices, Wi-Fi Alliance has introduced Wi-Fi HaLow™ as the designation for products incorporating IEEE 802.11ah technology for unlicensed use of spectrum for IoT communications.^{10/}

2.3 This massive increase in use of Wi-Fi capacity will require more spectrum and greater use of spectrum already available for Wi-Fi operations. Wi-Fi Alliance’s own research indicates that countries will need to find between 500 megahertz and 1 gigahertz of new spectrum for RLANs by 2025 in order to keep up with growing demand for, and increased use of, these networks.^{11/}

2.4 Allowing greater RLAN use of the 5150-5250 MHz band is especially important because the spectrum that has historically been used to support Wi-Fi – the 2.4 GHz band – has

^{7/} Cisco, *VNI Complete Forecast Highlights Tool*, available at http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html (last visited Mar. 8, 2017).

^{8/} *Id.*

^{9/} Forbes, *Roundup Of Internet Of Things Forecasts And Market Estimates, 2016*, Nov. 27, 2016, available at <https://www.forbes.com/sites/louiscolumnbus/2016/11/27/roundup-of-internet-of-things-forecasts-and-market-estimates-2016/#3674796292d5>.

^{10/} See, Wi-Fi HaLow, <http://www.wi-fi.org/discover-wi-fi/wi-fi-halow> (last visited Mar. 8, 2017).

^{11/} Wi-Fi Alliance, *Spectrum Needs Study, Final Report*, February 2017, at 29 (available at http://www.wi-fi.org/download.php?file=/sites/default/files/private/Wi-Fi%20Spectrum%20Needs%20Study_0.pdf) (“Spectrum Needs Study”).

become congested, rendering it challenging to use for popular applications such as video streaming and conferencing.^{12/} As a result, usage is now shifting rapidly to the 5 GHz band.^{13/}

2.5 In addition to being restricted by congestion, the 2.4 GHz band is not capable of supporting ultra-high-speed Internet applications because of its limited bandwidth.^{14/} RLANs now require more *contiguous* spectrum in the form of wider channels in order to take full advantage of technologies that can support higher data speeds and more resilient connections.^{15/} The latest Wi-Fi technology, known as 802.11ac, is designed to operate in the 5 GHz band with gigabit speeds and it is already beginning to dominate the wireless connectivity market.^{16/}

2.6 Modifying the rules governing the 5150-5250 MHz band would help address these limitations of the 2.4 GHz band by making available another 100 megahertz of contiguous spectrum – enabling the use of a 160 megahertz-wide channel in the lower part of the band. This would increase the amount of usable spectrum in the band by almost 20%, alleviating the looming performance and congestion challenges, and helping carriers to reliably deliver gigabit speeds.

2.7 The rule changes would also improve the coverage capabilities, improving reception in both home and other indoor locations. This increase will also allow Internet service providers to offer Canadians speeds of up to and beyond 1 GB per second, not just to their homes, but to their wireless devices outside the home. Finally, it would greatly enhance the use of Wi-Fi for current

^{12/} *Id.* at 23.

^{13/} *Id.*

^{14/} Wi-Fi Alliance, *Wi-Fi CERTIFIED ac*, available at <http://www.wi-fi.org/discover-wi-fi/wi-fi-certified-ac> (last visited Mar. 8, 2017).

^{15/} *Id.* at 29-30.

^{16/} *Id.*

and evolving applications, such as 4K video, that require faster speeds and wider channels (e.g., 80 megahertz and 160 megahertz) to enhance the customer experience.

2.8 Changes to the rules would also harmonize Canada’s regulations with those adopted by the United States Federal Communications Commission (“FCC”). In the United States, the technical rules for indoor and outdoor operations of equipment were liberalized in 2014,^{17/} and, as of today, over 1000 devices have been certified that take advantage of new rules in the 5150-5250 MHz band.^{18/} If ISED revises its rules to allow their use in Canada, these devices could quickly be incorporated into Canada’s Wi-Fi networks to improve speed and reliability in the same way they have in the United States. Moreover, use of rules already adopted in the U.S. will create an even larger marketplace for devices in the 5150-5250 MHz band, creating incentives for manufacturers to produce a wider variety of products for this band segment.

3.0 QUESTION B: THE POTENTIAL IMPACTS ON DOMESTIC AND FOREIGN SATELLITE SYSTEMS IN THE 5150-5250 MHZ FREQUENCY BAND OF AUTHORIZING HPODS USE PRIOR TO WRC 19 ON THE BASIS OF A MAXIMUM EIRP OF 4W.

3.1 Although the U.S. changed its rules several years ago, Wi-Fi Alliance is not aware of any interference-related complaints to the FCC regarding the outdoor operation of RLANs in the 5150-5250 MHz band. The FCC’s rules for the 5150-5250 MHz band were specifically designed to protect satellite receivers from aggregate interference, and there is no evidence to suggest that a similar approach in Canada would have different results. In fact, despite its initial

^{17/} See, *5 GHz FCC Order*.

^{18/} See Equipment Authorization Search, <https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm> (For Application Purpose select “Original Grant,” for Application Status field select “Grant Issued,” for Frequency Range in MHz field enter 5150 to 5250 (and uncheck “Exact Match”), for Power Output in Watts enter .25 to 1 (and uncheck “Exact Match”), and click “Start Search.”).

opposition, Globalstar supported the FCC’s 2014 relaxation of the rules governing RLANs in the 5150-5250 MHz band, believing that it provided them with “meaningful protection.”^{19/}

3.2 The regulatory constraints on RLANs in the 5150-5250 MHz band – indoor-only use and 200 mW EIRP limitation – were adopted at 2003 World Radio Conference primarily to protect a single mobile satellite system network – Globalstar. Noting that the United States acts as the “notifying administration” for the Globalstar satellite network at the International Telecommunications Union (“ITU”), and that the United States has reduced regulatory constraints on RLANs for protection of its Globalstar network, it is incongruous for other countries, such as Canada, to unnecessarily maintain these constraints.

3.3 The Department suggests that in order to protect the satellite earth station in the 5150-5216 MHz band operated by the Canadian Space Agency and Department of National Defence, it would consider adopting exclusion zones.^{20/} Wi-Fi Alliance agrees that, because of the limited number of anticipated stations, there will be a minimal impact on the deployment of HPODs. However, Wi-Fi Alliance questions whether those stations will be over-protected by a 25 km exclusion zone. Wi-Fi Alliance urges the Department to provide more information regarding the development of the exclusion zone. Any exclusion zones developed should take into account topography and other operational characteristics that may affect whether the specification of a uniformly circular exclusion pattern of 25 km is appropriate. In addition, while there is only a single affected station today, the Department should find that any future stations must be located as far from populated areas as possible in order to avoid creating populated exclusion zones. Even within exclusion zones, the Department should permit operations indoors.

^{19/} 5 GHz FCC Order at ¶¶ 28-33.

^{20/} 5 GHz Notice at ¶ 25.

3.4 In any case, Wi-Fi Alliance notes that, similar to the U.S., the Department would not be removing the requirement that RLANs – whether operating at higher or lower power levels – remain authorized for operations on a “no interference, no protection basis.”^{21/} As the *5 GHz Notice* discussed, the FCC has crafted interference protection rules and procedures that protect incumbent users in this band while also allowing RLAN use;^{22/} the Department can also use that architecture and adjust as needed to accommodate its existing rules.

4.0 QUESTION C: SHOULD THE DEPARTMENT PROCEED TO AUTHORIZE HPODS USE PRIOR TO WRC 19, WHAT REGULATORY APPROACH WOULD BEST ENSURE A BALANCE OF TIMELY DEPLOYMENT AND THE PROTECTION OF OTHER EXISTING AND FUTURE SERVICES IN THE 5150-5250 MHZ FREQUENCY BAND?

4.1 Wi-Fi Alliance recommends that the Department remove the restrictions on the use of RLANs in the 5150-5250 MHz band and increase the permissible power level of these devices to the levels adopted by the FCC in both indoor and outdoor settings. Because of the need for more spectrum for RLANs now, it is contrary to the public interest to wait until the outcome of WRC-19 before establishing technical rules for the operation of HPODs in Canada. Wi-Fi Alliance therefore recommends that the Department move as expeditiously as possible in authorizing the use of these devices in Canada.

4.2 Although the ITU has not yet adopted technical rules for the operation of HPODs in the 5150-5250 MHz band, the Department should not wait until after WRC-19 before developing rules for Canada. Delaying this rule revision until at least WRC-19 will mean that Canadians will be required to wait to enjoy the benefits that their American neighbors, and others around the world, are enjoying or will soon enjoy as a result of their countries’ rule changes.

^{21/} *Id.* at ¶ 22.

^{22/} *Id.* at ¶ 19.

4.3 Further, as mentioned above, HPODs operating in the 5150-5250 MHz band have already become common in the United States based on rule changes that occurred in 2014.^{23/} Over three years of real-world operation experience in the United States without reported incidents of interference amply demonstrate that HPOD operations in the 5150-5250 MHz band are viable.

4.4 Wi-Fi Alliance therefore urges the Department to harmonize its rules governing HPOD authorization with the FCC's regulatory approach for the 5150-5250 MHz band. The FCC has appropriately balanced the timely deployment of HPODs with the protection of other services in the band by imposing elevation mask and registration requirements that allow the tracking of major deployments of HPODs in the event that corrective action is required.^{24/} By adopting internationally consistent regulations, the Department will allow Canadian consumers and business to access much needed Wi-Fi services at reasonable costs.

4.5 Other members of the international community have also recognized the need to reform their technical rules for RLANS operating in the 5150-5250 MHz band. The United Kingdom, Australia, and India have all considered relaxing rules for the 5 GHz band based on their recognition of the need for additional spectrum for RLANS.^{25/}

^{23/} See *supra*, Note 15.

^{24/} 5 GHz FCC Order at ¶¶ 32-35.

^{25/} See 5 GHz FCC Order; *Improving Spectrum Access for Consumers in the 5 GHz Band*, Ofcom Consultation, at ii (rel. May 13, 2016), available at <http://stakeholders.ofcom.org.uk/binaries/consultations/5-GHz-Wi-Fi/summary/improving-spectrum-access-consumers-5GHz.pdf>; and See *Consultation Paper on Proliferation of Broadband Through Wi-Fi Networks*, Consultation Paper No. 14/2016, at 1 (2016), available at http://www.trai.gov.in/Content/ConDis/20782_11.aspx; *Five Year Spectrum Outlook 2016-20, The ACMA's spectrum management work program*, October 2016.

5.0 CONCLUSION

5.1 Wi-Fi Alliance applauds the Department's efforts to make the most of scarce spectrum resources. Given the ever-growing importance of Wi-Fi networks to Canadian businesses and consumers, it is important that the Department remove unnecessary restrictions on those networks, especially in the 5150-5250 MHz band, which is ideally suited to meet the high-bandwidth, high data-speed needs of developing wireless applications. The FCC's efforts in this area provide a model for how the Department can allow RLANs to operate in this band without interfering with incumbent users. Making these changes now will allow Canadians to reap benefits right away. As many countries around the world begin relaxing limitations on the use of the 5150-5250 MHz band, there is no reason for Canada to delay deployment of much needed RLAN services.