



PUBLIC INTEREST ADVOCACY CENTRE
LE CENTRE POUR LA DÉFENSE DE L'INTÉRÊT PUBLIC

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19 January 2021

Innovation, Science and Economic Development Canada
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Re: Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band
Canada Gazette, Part I
Gazette Notice No. SMSE-014-20
Publication Date: 19 November 2020

Comments of the Public Interest Advocacy Centre

Dear Sir or Madam,

The Public Interest Advocacy Centre is pleased to provide its comments to Innovation, Science and Economic Development Canada ("ISED") on the Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band ("Consultation") in the attached document.

Sincerely,

John Lawford
Executive Director & General Counsel

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Innovation, Science and Economic Development Canada

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in the 6 GHz Band***

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Public Interest Advocacy Centre**

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Introduction

1. The Public Interest Advocacy Centre is pleased to provide its comments to Innovation, Science and Economic Development Canada (“ISED”) on the *Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band* (“Consultation”).¹ PIAC last submitted comments on spectrum use in the 2017 *Consultation on the Technical and Policy Framework for Radio Local Area Network Devices Operating in the 5150-5250 MHz Frequency Band*, in which PIAC supported less restrictive use of spectrum for the benefit of Canadian consumers.² The driving factor behind PIAC’s position in the 2017 consultation was the growing consumer demand for wireless capacity and broadband access. The basis for PIAC’s submission for this Consultation has not changed.
2. PIAC agrees with ISED that the proposal to introduce licence-exempt operation in the 6 GHz band is aligned with the policy objectives of the *Telecommunications Act*. Releasing the 6 GHz band for unlicensed operations, subject to protections for incumbent licensees, will “facilitate the orderly development throughout Canada of a Telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions,” “render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada,” “stimulate research and development in Canada in the field of telecommunications and to encourage innovation in the provision of telecommunications services,” and “respond to the economic and social requirements of users of telecommunications services.”³

¹ Innovation, Science and Economic Development Canada, *Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band* (November 2020), SMSE-014-20, online: ISED <[https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SMSE-014-20-2020-11EN.pdf/\\$file/SMSE-014-20-2020-11EN.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SMSE-014-20-2020-11EN.pdf/$file/SMSE-014-20-2020-11EN.pdf)>.

² Innovation, Science and Economic Development Canada, *Consultation on the Technical and Policy Framework for Radio Local Area Network Devices Operating in the 5150-5250 MHz Frequency Band* (January 2017), SMSE-002-17, online: ISED <[https://www.ic.gc.ca/eic/site/smtgst.nsf/vwapj/SMSE-002-17-consultation-5150.pdf/\\$FILE/SMSE-002-17-consultation-5150.pdf](https://www.ic.gc.ca/eic/site/smtgst.nsf/vwapj/SMSE-002-17-consultation-5150.pdf/$FILE/SMSE-002-17-consultation-5150.pdf)>.

³ *Telecommunication Act*, SC 1993, c 38, ss 7(a), (b), (g), and (h).

Full support of ISED’s proposal, with a view to future release of additional spectrum for standard-power RLANs

3. PIAC strongly supports ISED’s proposal to allow three classes of Radio Local Area Network (RLAN) technology to operate licence-exempt in the 6 GHz spectrum band. Specifically, PIAC supports the licence-exempt operation of low-power indoor-only RLANs and very low-power RLANs (both indoor and outdoor) across the entire 6 GHz band without the control of Automated Frequency Coordination (AFC). PIAC also supports the licence-exempt indoor and outdoor operation of standard-power RLANs under the control of an AFC system within the lower 5925 – 6875 MHz sub-band.
4. However, PIAC also believes that the public benefits of licence-exempt spectrum use can be maximized by extending standard-power RLAN operations across the entire 6 GHz band. ISED has acknowledged that standard-power access points (APs) could form part of a larger system of wireless technologies that can deliver broadband to rural users. Given the ongoing and pressing need for affordable and reliable Internet service in rural and remote areas, and the glacial deployment of rural broadband, any concrete steps towards expanding rural access must be leveraged to their full potential.
5. PIAC acknowledges that ISED’s proposal excludes standard-power RLANs from the upper sub-bands to protect the operation of transportable TV pick-up services, which can only operate in the 6930-7125 MHz frequency range. Further technical development may be required to develop an AFC system that can “effectively determine exclusion zones given the mobile nature of these broadcasting auxiliary services.”⁴ PIAC therefore defers to the technical expertise of ISED and other more technically-versed parties in this matter. However, given the urgent needs of underserved areas, PIAC encourages the development of a robust AFC system and appropriate technical requirements that will allow standard-power RLANs to operate across the entire 6 GHz band without risking interference with the operations of incumbent licensees.
6. PIAC believes that opening up spectrum for licence-exempt use will help relieve the accessibility and affordability crisis that currently drives the digital divide in Canada. The use of licence-exempt spectrum makes both mobile and fixed broadband more affordable, and supports competition by enabling more wireless service providers to leverage low barriers to entry. In addition, licence-exempt spectrum provides the much-needed capacity required to support new wireless technologies in the 5G ecosystem, and to support Wi-Fi 6 enabled devices that can offer better speed, reliability, and battery life. Reaping the full economic benefits of the expanding ecosystem of Internet of Things (IoT) devices will also depend on the availability of licence-exempt spectrum, to support both home and personal devices, as well as wider industrial applications.

⁴ *Supra* note 1, at para 53.

7. While PIAC supports introducing licence-exempt use of the 6 GHz band to improve accessibility and boost the Canadian economy, PIAC believes that it is equally important to protect incumbent licensees that use licenced spectrum to support wireless backhaul and to provide essential services like electrical utilities and public safety systems. As such, PIAC is in support of instituting appropriate technical measures to prevent licence-exempt operations from interfering with licenced operations. As mentioned above, PIAC further encourages ISED to consider whether AFC systems can be developed to enable co-existence of both unlicensed and licenced operations across the entire 6 GHz band. While PIAC acknowledges that AFC technology may be limited in its current state, future applications should aim to maximize the use of finite spectrum. Allocating spectrum bands for exclusive use by licenced operations should not come at the cost of wasted spectrum capacity.

Factual Basis for Position

Unlicensed spectrum will meet wireless telecommunications needs

8. Wireless telecommunications play an increasingly essential function in the backbone and development of the Canadian economy. Licence-exempt spectrum in other frequency bands already supports Wi-Fi and hotspot use, data-intensive applications, and the offloading of traffic from mobile cellular networks. Yet, the demand for additional spectrum for licence-exempt use is increasing along with the demand for more capacity and reliability for wireless technologies. The COVID-19 pandemic has thrown this into sharper focus, as Canadians have come to heavily depend on home Internet to support the simultaneous load of working, learning and socializing from home. Many households, particularly those in remote and rural areas, have struggled or have simply been unable to access reliable and affordable Internet services.
9. In April 2020, the Federal Communications Commission (FCC) in the US opened up 1200 MHz of the 6 GHz band for unlicensed use, specifically allowing two types of devices – low-power, indoor-only devices that can use all 1200 MHz of the 6 GHz band, and standard-power devices that may only use two sub-bands within the 6 GHz band, and which must be under the control of the Automated Frequency Coordination system.⁵ ISED’s proposal largely harmonizes with the FCC’s order. Adopting the FCC’s approach to unlicensed spectrum use aligns with the goals in ISED’s *Spectrum Outlook 2018 to 2022*, which established the importance of harmonizing spectrum bands with the US, which would “ease cross-border coordination, interoperability, economies of scale and roaming between countries.”⁶
10. The FCC decision cited the increasing demand for wireless broadband as one of the factors for opening up the 6 GHz band for unlicensed spectrum operations. Primarily, the FCC sought to address the increasing average data per month use, for which a large proportion of mobile data

⁵ Federal Communications Commission, *In the Matter of Unlicensed Use of the 6 GHz Band; Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz* (23 April 2020), FCC-20-51.

⁶ Innovation, Science, and Economic Development Canada, *Spectrum Outlook 2018 to 2022* (6 June 2018), SLPB-003-18, online: ISED <<https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11403.html#s2>>.

traffic is delivered on an unlicensed basis.⁷ Average data usage is also steadily rising in Canada. The 2020 *Communications Monitoring Report* indicates that the average mobile data usage increased from 2.5 GB/month in 2018 to 2.9 GB/month in 2019.⁸ Additionally, the percentage of subscribers with data plans jumped from 85.3% in 2018 to 90% in 2019.⁹ These statistics implicate a greater need for data capacity, which unlicensed spectrum can accommodate.

11. In the Consultation paper, ISED cited a WiFiForward study that showed in the US context that faster broadband from deploying Wi-Fi in the 6 GHz band could contribute \$13.25 billion to the US' GDP by 2025.¹⁰ The study also estimated that applications and economic investments that rely on low-power Wi-Fi use in the 6 GHz band would total in economic value at \$153.76 billion between 2020 and 2025. The same study projects \$13.60 billion in savings for cellular operators offloading 5G traffic to Wi-Fi devices. PIAC is aligned with ISED's view that making the 6 GHz band available for unlicensed operations will offer similar economic benefits for Canada.

Protection of incumbent licensees is a priority

12. In Canada, the 6 GHz band is currently used by licenced systems such as fixed microwave backhaul, fixed satellite service systems, television auxiliary systems, and radio astronomy.¹¹ The largest user group in the 6 GHz band is fixed service licensees that operate point-to-point microwave systems. Wireless service providers rely heavily on the 5925-6930 MHz band for backhaul deployments along transportation corridors between population centers to provide basic telecom services to a location from which service will then be distributed to end users.
13. Fixed satellite systems also use bands in the 6 GHz band to provide connectivity in remote areas where fibre or terrestrial wireless connections are not practical or economically feasible. Licensed spectrum space is already dedicated to several essential public services; electrical utilities operate fixed systems across Canada to monitor and control the electricity grid, and to deliver electricity services to the public. Public safety agencies use backhaul systems to inter-connect base stations, and broadcasters use fixed microwave links to provide consumers with services like direct-to-home television services. PIAC recognizes and supports that the 6 GHz spectrum will remain in use for these services.
14. Fortunately, new spectrum-sharing techniques enable efficient spectrum access between multiple services, including opportunistic access – these techniques could be used to allow access to the 6 GHz band for new services while maintaining access for existing services. ISED has already looked to the FCC's studies and conclusions regarding 6 GHz, and is of the view that "with the appropriate technical measures in place, the proposals for the operation of RLANs in the 6 GHz band would sufficiently protect Canadian licenced incumbents and support ISED's goal of enabling technologies

⁷ *Supra* note 5, at para 2.

⁸ Canadian Radio-television and Telecommunications Commission, *Communications Monitoring Report* (December 2020), at p 47, online: CRTC <<https://crtc.gc.ca/pubs/cmr2020-en.pdf>>.

⁹ *Ibid.*

¹⁰ *Supra* note 1, at para 10.

¹¹ *Supra* note 1, at para 11.

and approaches that will support the increased sharing of spectrum.”¹² PIAC agrees that current and future techniques can be leveraged to maximize spectrum-sharing.

15. In reference to PIAC’s position and factual basis above, PIAC provides its answers to the Consultation questions below. PIAC reserves the right to reply to any comments made by other parties on the technical merits of the proposal.

Questions

Q1: ISED is seeking comments on the timelines for the availability of:

- a. low-power equipment ecosystems, both Wi-Fi 6E and 5G NR-U*
- b. standard-power equipment ecosystems, both Wi-Fi 6E and 5G NR-U, under the control of an AFC*
- c. AFC*

16. PIAC defers to ISED on the matter of appropriate timelines for the deployment of low-power and stand-power equipment ecosystems, and Automated Frequency Coordination systems. However, PIAC submits that before deploying the ecosystem, ISED should carefully consider input from stakeholders on the appropriate standards for AFC-enabled devices and the AFC system itself.

Q2: ISED is seeking comments on its proposals to allow licence-exempt RLAN use in the 5925-7125 MHz band.

17. PIAC is in full support of ISEDs’ proposal to allow licence-exempt RLAN use in the 5925-7125 MHz band.

Q3: ISED is seeking comments on the proposed footnote Cxx and the changes to the CFTA as shown in table 2.

18. PIAC supports the addition of the footnote Cxx to the CFTA revisions to 6 GHz allocation as shown in Table 2 of the Consultation paper. PIAC agrees that adding the following footnote adequately communicates that licensed spectrum systems must be protected from interference by new unlicensed spectrum systems:

“Licence-exempt RLAN applications in the 5925-7125 MHz band must operate in accordance with the established spectrum policy and technical framework; and

¹² *Supra* note 1, at para 49.

must not cause harmful interference to, or claim protection from, licensed systems operating in the band.”

Q4: ISED is seeking comments on the proposed rules for standard-power RLANs:

- a. indoor and outdoor operation would be permitted*
- b. RLAN access points would only be permitted to operate under the control of an AFC system in the 5925-6875 MHz frequency range*
- c. maximum permitted e.i.r.p. would be 36 dBm*
- d. maximum permitted power spectral density would be limited to 23 dBm/MHz*
- e. use of a vertical elevation mask, with a maximum e.i.r.p. of 125 mW at elevation angles above 30 degrees over the horizon, would be required*

19. PIAC is not in a position to comment on the technical merits of the proposed rules for standard-power RLANs, but in the interest of harmonization with the FCC’s approach to unlicensed 6 GHz spectrum, PIAC generally supports the rules.

Q5: ISED is seeking comments on allowing access to the additional 100 MHz of spectrum in the 6425-6525 MHz sub-band for standard-power operation.

20. PIAC supports allowing access to the additional 100 MHz of spectrum in the 6425-6525 MHz sub-band for standard-power operation. As discussed above, PIAC also supports the operation of standard-power systems across the entire 6 GHz band, subject to current and future technical considerations.

Q6: ISED is seeking comments on the equipment availability of standard-power RLANs in the 6425-6525 MHz band and the impact on the development of AFC systems for Canada due to a potential lack of international harmonization for that sub-band.

21. PIAC submits that despite a potential lack of international harmonization for the 6425-6525 MHz sub-band, there is still significant public benefit in developing AFC systems and standard-power equipment in the Canadian context, for all the reasons cited above, including improved rural broadband deployment and wireless technology development.

Q7: ISED is seeking comments on the proposed rules for low-power indoor-only RLANs:

- a. operation would be permitted indoor only across the 5925-7125 MHz band*
- b. the use of a contention-based protocol (e.g. listen-before-talk) would be required*
- c. maximum permitted e.i.r.p. would be 30 dBm*

d. maximum permitted power spectral density would be limited to 5 dBm/MHz

22. PIAC supports the proposed rules for low-power indoor-only RLANs, which are harmonized with the FCC's equivalent rules on low-power indoor-only access points.

Q8: ISED is seeking comments on the proposed rules to allow very low-power RLAN devices:

a. operation would be permitted indoors and outdoors across the frequency range 5925-7125 MHz band

b. the use of a contention-based protocol (e.g. listen-before-talk) would be required

c. maximum permitted e.i.r.p. would be 14 dBm

d. maximum permitted power spectral density would be limited to -8 dBm/MHz

23. PIAC supports the proposed rules for very low-power RLAN devices.

Q9: ISED is seeking comments on potential business models for AFC administrators to operate their AFC systems in Canada.

Q10: ISED is seeking comments on its proposal to permit the approval of multiple, third party AFC systems, taking into account the potential for the development of a sustainable market for AFC systems in Canada.

Q11: ISED is seeking comments on potential exit strategies if the AFC administrator decides to cease operation in Canada.

Q13: ISED is seeking comments on the implementation considerations for the operation of an AFC system, specifically:

a. information required from licensed users

b. interference protection criteria for computation of exclusion zones

c. information required from standard-power APs

d. frequency of AFC update of licensee information

e. security and privacy requirements

Q14: ISED is seeking comments on any additional considerations, limits or general concerns that should be taken into account in setting detailed standards and procedures for AFC operation.

Q15: ISED is seeking comments on its proposal to require AFC systems to protect the following types of licensed stations from standard-power APs:

a. fixed microwave stations

b. fixed point-to-point television auxiliary stations

c. radio astronomy stations

Q16: ISED is seeking comments on the sample agreement related to the designation and operation of an AFC system in Canada.

Q17: ISED is seeking comments on the proposed approach to incremental implementation of an AFC system in Canada.

Q18: ISED is seeking comments on the objective to maximize the potential for synergies, where possible, in defining the technical and administrative requirements for the respective databases addressing different bands under different technical regimes.

24. Regarding questions 9 to 18, PIAC is not in a position to comment in depth about the appropriate technical and administrative requirements of AFC operations. However, PIAC generally emphasizes the importance of protecting existing licensed systems that support essential services such as electrical utilities and public safety systems. PIAC reserves the right to reply to any comments from other parties regarding the appropriate technical and administrative framework for APC systems.

Conclusion

25. PIAC submits that ISED should move forward with its proposal as soon as feasible, not only to accelerate the deployment of essential wireless services and advance economic development, but to harmonize with the US' recent adoption of licence-exempt 6 GHz spectrum use, and to seize upon the global momentum toward co-existence of licenced and unlicensed use of spectrum in the 6 GHz band. PIAC thanks ISED for the opportunity to participate in this Consultation, and looks forward to responding to the comments submitted by other parties in this process.