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Re: Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band; Nov. 2020, *Canada Gazette*, Part I, notice reference number SMSE-014-20

The Dynamic Spectrum Alliance (DSA)[1] appreciates the opportunity to share its reply comments to the questions posed in the Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band (the Consultation).[2]

DSA applauds ISED's recognition that dynamic spectrum access can maximize efficient use of the 6 GHz band by expanding unlicensed access while protecting the various incumbent users. DSA is convinced that opening the 6 GHz frequency band for new unlicensed devices will ensure that widely used unlicensed wireless technology, such as Wi-Fi, can deliver the necessary performance for future applications and networks. DSA also supports ISED's proposal to rely on automated frequency coordination (AFC) systems to manage access to the 6 GHz band, building on the hard work of DSA's member companies to increase economic and consumer value of spectrum resources.

Please do not hesitate to contact me for further discussions or clarifications.

Best regards,

Martha SUAREZ
President,
Dynamic Spectrum Alliance

[1] DSA is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. A full list of Dynamic Spectrum Alliance members is available on the DSA website at the DSA Website.
[2] "Consultation on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band" ISED; https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11643.html ('Consultation Document').

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DSA REPLY COMMENTS TO THE QUESTIONS POSED IN THE CONSULTATION ON THE TECHNICAL AND POLICY FRAMEWORK FOR LICENCE-EXEMPT USE IN THE 6 GHZ BAND

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

Commenters broadly agree that Low Power Indoor ("LPI") Wireless Access Systems / Radio Local Area Network ("RLAN") devices that can span the entire 5925-7125 MHz ("6 GHz") band will be widely available beginning this spring. In 2021, over 300 million Wi-Fi 6E devices are forecast to enter the market globally.[3] While only some countries will initially permit 6 GHz RLANs to operate throughout the entire band, two of these countries, the United States and South Korea alone, represent a combined market of over 380 million people.

There was broad agreement that the proximity of the 6 GHz band to the 5 GHz allows for existing Wi-Fi 6 devices operating in the 5 GHz band to be readily redesigned. In the United States, standard power Wi-Fi 6E RLANs will be available for widespread deployment pending certification of the AFC system and certification of Automated Frequency Coordination ("AFC") - connected RLAN device.

Several commenters agreed with DSA that commercial-ready prototypes have been developed and demonstrated for U.S. market.[4] The Wi-Fi Alliance and the WinnForum are actively developing technical specifications to enable AFC implementation, and the work of the Multi Stakeholder Group is progressing. Commercial availability of the AFC in the United States is dependent on the FCC's release of public notice regarding the certification of the AFC and the AFC connected RLAN-device. The FCC is expected to initiate the AFC system operator approval and AFC system certification processes by mid-year, with the goal of completing its work by the end of the year. [5] CanWISP expressed concern that a Canadian AFC database may not be available in the short-term following the availability of equipment for this band and believes that if ISED's technical rules are on par with the U.S. requirements, it "may encourage the registration of U.S. approved database administrators in the Canadian market".[6]

[3] *See* Comments of the Wi-Fi Alliance ("WFA") at 2.
[4] *See* Comments of Federated Wireless at 2; *See* Comments of Hewlett Packard Enterprise Canada ("HPE Canada") at 3.
[5] *See* Comments of Federated Wireless at 2.
[6] *See* Comments of the Canadian Association of Wireless Internet Service Providers ("CanWISP") at 4-5.

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

Based on studies and projections of data usage trends, many commenters agree with DSA that all 1200 MHz in the 6 GHz band is required to meet the future demand for licence-exempt spectrum in Canada.[7] Even satellite interests do not oppose as long as the primary fixed satellite service is protected from harmful interference.[8] Canadian mobile network operators ("MNOs") will benefit from the ability to access all 1200 MHz of licence-exempt spectrum for Wi-Fi offloading and other purposes. The projected in spectrum demand for Wi-Fi offloading alone in Canada is significant.[9] This is the reason ISED should be highly skeptical of Rogers' contention that "adding 500 MHz will be more than sufficient to meet the future demand for mid band licence-exempt spectrum for years to come".[10]

Canadians will require licence-exempt access across the 6 GHz band to take full advantage of the new capabilities enabled by the multiple, higher-capacity160 MHz wide channel sizes available with Wi-Fi 6E and the multiple, even higher-capacity 320 MHz wide channels planned for the next generation Wi-Fi 7 devices. New- and evolving Low Power Indoor ("LPI") and Very Low Power ("VLP") device use cases such as immersive Augmented Reality / Virtual Reality ("AR/VR") require these higher bandwidths to ensure a good consumer experience. Canadian Wireless Internet Service Providers ("WISP") require as much spectrum as available to support high-capacity broadband access. Xplornet states that, "access to new unlicensed 6 GHz spectrum will be extremely important to not only meeting the USO, but to achieving future service capabilities that continue to meet the evolving needs of rural Canadians".[11]

[7] *See* Comments of Apple Canada, Inc. at 4; *See* Comments Canadian Communication Systems Alliance at 1; *See* Comments of CanWISP at 5; *See* Comments of Cogeco Communications at 4; *See* Comments of Federated Wireless at 2; *See* Comments of HPE Canada at 3; *See* Comments of Intel Corporation ("Intel") at 2-4; *See* Comments of Apple Canada, Inc., Broadcom, Inc., Cisco Systems, Inc., Facebook, Inc., Google LLC, Hewlett Packard Enterprise, Intel Corporation, Microsoft Corporation, Qualcomm Incorporated, CommScope, Inc. ("Joint Commenters") at 16; *See* Comments of the Public Interest Advocacy Centre at ¶ 17; *See* Comments of PSBN Innovation Alliance at ¶ 39; *See* Comments of Qualcomm Incorporated ("Qualcomm") at 5; *See* Comments of Shaw Communications ("Shaw") at ¶ 41; *See* Comments of TekSavvy at ¶ 4; *See* Comments of the WFA at 3; *See* Comments of the Wireless Broadband Alliance ("WBA") at 5-6.

[8] *See* Comments of the Global VSAT Forum at 3; *See* Comments of Inmarsat at 1; *See* Comments of SES Americom ("SES") at 2-3.

[9] *See* Comments of Joint Commenters at 16.

[10] *See* Comments of Rogers Communications Canada ("Rogers") at ¶ 109.

[11] *See* Comments of Xplornet Corporation ("Xplornet") at ¶ 15.

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Some Canadian MNOs and their global partners are requesting ISED delay making any decisions on spectrum above 6425 MHz until after WRC-23.[12] Several phrase their comments in such a way to make it appear that all three ITU regions are studying the 6425-7125 MHz frequency range for possible IMT identification. In fact, WRC-23 is only considering a possible global IMT identification for the 7025-7125 MHz band. It is only considering IMT identification for the 6425-7125 MHz band in ITU Region 1. The ITU is not considering an IMT identification for the 6425-7025 MHz band for ITU Region 2 (Americas) and ITU Region 3 (Asia – Pacific). Further, despite what some parties may believe, it is far from guaranteed that WRC-23 will decide to identify either frequency band for IMT. The results of earlier IMT sharing studies with 6 GHz incumbents were not favorable. The preparatory work for new sharing and coexistence studies is still at a very early stage, will likely to contentious, and with an uncertain outcome. As the Global VSAT Forum describes, "A single IMT transmitter can emit EIRP levels several orders of magnitude higher than the received satellite transmitted signals at the feeder link receive antenna".[13] It is also important to note that there are no WRC-27 future agenda items to study the possible identification of IMT in the 6425-7025 MHz frequency range in ITU Region 2 and ITU Region 3. In sum, the DSA shares Shaw's reservations "whether such a "wait and see" approach is in the best interest of consumers".[14]

In fact, there is regional momentum in ITU Region 2 to make the entire 1200 MHz band available for licence-exempt use. RABC provided the list of countries in the Americas where there are rules in place or consultations initiated for permitting licence-exempt operations across the entire 6 GHz band.[15] The Republic of Korea in ITU Region 3 has put in place regulations for licence-exempt use throughout 6 GHz band. Jordan and Saudi Arabia in ITU Region 1 have recently initiated consultations to examine the entire 6 GHz band for licence-exempt operations.

Moreover, along with DSA, several commenters recognize that licence-exempt operations will not constrain future growth of Fixed Service ("FS") and Fixed Satellite Service ("FSS") operations in the 6 GHz band.[16] According to the proposed Canadian footnote for the 6 GHz band, RLAN operations must not cause harmful interference to, or claim protection from, licensed systems operating in the band. Outdoor IMT operations at typical operating parameters and deployment densities have not been shown to be compatible with these other services and

[12] *See* Comments of Bell Canada at ¶ 28; *See* Comments of Huawei Technologies Canada Co., Ltd. ("Huawei") at 4; *See* Comments of the Mobile Interest Group at 9; *See* Comments of Quebecor Media at ¶ 13; *See* Comments of Rogers at ¶ 25; *See* Comments of Saskatchewan Telecommunications ("SaskTel") at ¶ 18; *See* Comments of TELUS Communications, Incorporated ("TELUS") at ¶ 33.
[13] *See* Comments of Global VSAT Forum at 2.
[14] *See* Comments of Shaw at ¶ 30.
[15] *See* Comments of Radio Advisory Board of Canada ("RABC") at ¶ 16.
[16] *See* Comments of Apple – "IMT sharing with incumbent services (e.g., Fixed Satellite Service and Fixed Service) is likely to be difficult – and may require relocation of existing operations which is likely not required with a licence-exempt solution."; *See* Comments of Joint Commenters at 25.

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likely would force these services either to relocate to other spectrum bands or to cease operations. The Joint Commenters note "…high power IMT outdoor operations would create sharing challenges with FSS uplink operations, thus requiring those services be relocated, or forcing the reduction of IMT power to a level that would not provide adequate coverage/performance and therefore would not justify investment".[17] With respect to the relocation of incumbents, if there is no legal framework or regulatory mechanism to create a spectrum relocation fund in Canada as in the United States, incumbent relocation costs will fall entirely on the FS and FSS operators and presumably passed through to their Canadian customers.

Finally, from a mitigation standpoint, several commenters agreed that having licence-exempt devices spread their energy over a larger spectrum band, will be helpful[18].

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

Most commenters agree with DSA and support ISED's proposed footnote language.

Separately, the DSA agrees with Canadian Satellite and Space Industry Forum that the consideration of a mobile allocation for the 5925-7125 MHz range is out of scope for this Consultation.[19]

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

Overall, there is strong support for ISED to authorize Standard Power licence-exempt RLAN devices in the 6 GHz band under control of an AFC system. The AFC system will protect incumbent Fixed Service operation from receiving harmful interference by single-entry interferers by ensuring that 6 GHz Standard Power devices only access available frequencies in the band at that location. The FCC in its analysis authorizing 6 GHz operations made clear that it

[17] *See* Comments of Joint Commenters at 25.
[18] *See* Comments of Canadian Satellite and Space Industry Forum (CCSSIF) at 3; *See* Comments of HPE Canada at 4; *See* Comments of Shaw at ¶34; *See* Comments of the WBA at 6.
[19] *See* Comments of the Canadian Satellite and Space Industry Forum ("CCSSIF") at 1.

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examined the potential of aggregate interference to the Fixed Satellite Service uplinks and determined this is not an area for concern.[20] As an extra level of protection, the FCC required outdoor Standard Power RLANs to incorporate a vertical emissions mask, even though it acknowledged it was not technically required.[21] SES Americom effectively seeks to relitigate the FCC decision through this Consultation. SES rests its case on an over-estimate of the projected number of Standard Power RLANs deployed outdoors and a much more sensitive I/N value.[22]

Authorization of 6 GHz Standard Power devices provides the green light necessary for prospective Canadian AFC developers to move forward and make the required investments. Delaying action until ISED can observe AFC deployment in the United States for an extended period as one commenter suggests[23], would disincentivize Canadian AFC developers from taking the initiative.

Most commenters in support of 6 GHz Standard Power RLAN devices agree that both indoor and outdoor standard-power operations should be permitted. Use of the AFC, when combined with building entry loss, will ensure indoor standard power RLANs do not cause harmful interference to outdoor incumbent operations. Thus, a vertical emissions mask should not be required for indoor standard power RLANs.

Outdoors, the AFC plus the proposed vertical emissions mask should ensure that Standard Power RLANs do not cause harmful interference to outdoor incumbent operations. Several parties agree that the vertical emissions mask requirements for outdoor RLANs in Canada should be harmonized with those for outdoor RLANs in the United States.[24] The majority of Canadians live within 161 km of its border with the United States. Most of the economic activity, a proxy for where Standard Power RLANs would be deployed (given the EIRP limit) is likewise relatively close to the U.S. border. The DSA agrees with Rogers[25] that it makes sense not to require a vertical emissions mask with a more restrictive angle than 30 degrees above the horizon. Rogers is concerned that given the relatively small size of the Canadian market, a more stringent vertical emissions mask would increase the cost for outdoor 6 GHz Standard Power RLANs. The DSA further agrees that if additional mitigations for specific satellites are indeed required locally

[20] United States Federal Communications Commission ("FCC"), *Unlicensed Use of the 6 GHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 3852 (2020) ("6 GHz Order" and "6 GHz Further Notice", respectively) at ¶¶ 91-92.
[21] *See ibid* at ¶ 194 "We are limiting upward power from standard-power access points merely as a precautionary measure as they are more likely to operate outdoors and with higher power. We note that client devices can operate with EIRP as high as 30 dBm, but we find that they are less likely to cause interference to satellite receivers than similarly powered outdoor access points due to the nature of their operation."
[22] *See* Comments of SES at 4-5.
[23] See Comments of Bell Canada at ¶¶ 24-25, See Comments of Rogers at ¶ 98, See Comments of TELUS at ¶ 24.
[24] *See* Comments of Joint Commenters at 28 , *See* Comments of Rogers at ¶102, *See* Comments of SaskTel at ¶24.
[25] *See* Comments of Rogers at ¶ 102.

for the far northern latitudes, ISED can program that information into its database, which would then be provided to the AFCs.

Most commenters in favor of standard-power RLANs support ISED's proposed EIRP limit of 36 dBm and a PSD limit of 23 dBm. Several commenters did propose increasing the EIRP limit.[26] If ISED takes this approach, similar to the proposal under consideration by the FCC, it should only consider point-to-point operations in less densely populated and underserved areas rather than point-to-multipoint use. Additionally, ISED should also consider the use of directional antennas for purposes of calculating the list of available channels at a location. There was also support for ISED establishing standard power RLAN client device EIRP and PSD limits that are harmonized with those authorized by the FCC.

As will be described below, several commenters agree with DSA that Standard Power RLANs should be able to operate throughout the 5925-6930 MHz range. Finally, the DSA strongly disagrees with parties requesting ISED delay taking any action regarding Standard Power RLANs operating above 6425 MHz until at least after WRC-23 completes in the fourth quarter of calendar 2023. Canadian consumers and businesses can and should be allowed to benefit from the availability of the additional RLAN channels for indoor and outdoor operations before then.

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.

For Commenters not opposed to ISED making more than 5925-6425 MHz available for unlicensed use or opposed to the idea of Standard Power operations in its entirety, there was broad consensus is that ISED should, as a minimum, permit Standard Power operations in the 6425-6525 MHz sub band. Several commenters agree with DSA that ISED should extend the spectrum band available for standard power operations to 6930 MHz.[27] Intel concurs, noting that increasing the band by 55 MHz "enables two additional 20 MHz channels, one additional 40 MHz channel, one additional 80 MHz channel, one additional 160 MHz channel (6 channels instead of 5) or one additional 320 MHz channels (3 channels instead of 2) for Standard Power indoor/outdoor operation under control of AFC. If and when the segment of band is utilized for transportable TV pick-up services, AFC Systems can be updated to exclude the segment".[28] Finally, Apple and PIAC supports the operation of Standard Power systems across the entire 6 GHz band.[29]

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[26] *See* Comments of CanWISP ("higher EIRP in low population areas") at ¶ 13; *See* Comments of Canadian Communications Systems Alliance ("fully support CanWISP) at 1; *See* Comments of Federated Wireless at 3; *See* Comments of Huawei at 5; *See* Comments of TELUS at ¶ 38; *See* Comments Xplornet at ¶ 22.

[27] *See* Comments of Federated Wireless at 3; *See* Comments of Intel at 5; *See* Comments of HPE at 6; *See* Comments of WBA at 9-10.

[28] See Comments of HPE at 9; See Comments of Intel at 5.

[29] *See* Comments of Apple at 7; See Comments of PIAC at ¶ 20.

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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. In providing comments, respondents are requested to include supporting arguments and rationale and take the Canadian context into consideration in their response.

Most Commenters agree with DSA that the 6425-6525 MHz frequency sub-band can be readily incorporated into Canadian AFCs, without increasing the risk of harmful interference. First, Qualcomm's chip sets (and presumably those from other vendors) support Standard Power operations throughout the 6 GHz band, including the 6425-6525 MHz range.[30] All Wi-Fi Alliance certified devices will work in this sub-band.[31] Shaw performed its due diligence and determined that, "based on our discussions with chipset and equipment manufacturers, standard power equipment manufactured for the U.S. and other international markets should be able to operate within this band with appropriate firmware revisions".[32] In light of the record established, Rogers might want to re-examine its claim that, "If the Department decides to depart from the U.S. and allow standard-power RLANs in the 6425-6525 MHz band, the equipment availability may be limited to devices that are capable of tuning to U-NII-6."[33]

The general sentiment is that only minor technical changes will be required to expand the range of standard power operations by 100 MHz.[34] Importantly, as Federated Wireless clearly states, "…use of the AFC to compute interference protection is not limited to particular frequency bands or particular incumbents".[35] This means that if ISED chooses to extend the permitted frequency range for standard power RLAN up to 6930 MHz, the AFC firmware can be updated accordingly to determine the available channels in this further extended range.

As stated by CanWISP "the software can prevent the standard power channels from operating in the United States".[36] The AFC can ensure that Canadian standard power device operations in this sub-band will not cause harmful interference to licensed operations in the 6425-6525 MHz frequency sub-band in the United States. Even Huawei note that "No technical delay is foreseen

[30] *See* Comments of Qualcomm at 5.
[31] *See* Comments of TekSavvy at 10-11.
[32] *See* Comments of Shaw at ¶ 50
[33] *See* Rogers at paragraph ¶ 107.
[34] *See* Comments of Sony Electronics Incorporated ("Sony") at 3.
[35] *See* Comments of Federated Wireless at 4.
[36] *See* Comments of CanWISP at ¶ 21.

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in making Standard Power RLAN available in the 6425-6525 MHz band in addition to 5925-6425 MHz".[37] RABC agrees that no delay is envisioned.[38]

As some of the mobile license holders in the United States in this sub-band are public safety entities with a statewide license, the simplest way to implement may be through exclusion zones that extends some distance north from the border with the United States.[39] The DSA is not weighing in on what the size of the exclusion zone should be except that the I/N = -6 dB interference protection criteria should be applied. ISED may also consider a different size exclusion zone for indoor Standard Power devices than for outdoor Standard Power devices as the transmitted signal of indoor devices is attenuated by building entry loss.

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

Most commenters agreed with DSA that ISED should follow the FCC model where the PSD limit is fixed and the EIRP limit is reduced as the channel size decreases.

There was broad support for low power indoor (LPI) RLANs operating with a Power Spectral Density ("PSD") limit floor of 5 dBm/MHz. The two issues where there are differing views are whether LPI devices should be allowed to operate across the entire 6 GHz band or some portion of it, and whether the PSD limit should be increased to 8 dBm/MHz.

Commenters opposing license-exempt operations above 6425 MHz opposed LPI operations above 6425 MHz. Commenters support license-exempt operations throughout the 5925-7125 MHz range, support LPI operations across the entire 6 GHz band.

Several commenters agree with DSA in supporting an 8 dBm/MHz PSD limit for LPI devices.[40] While there is recognition that the FCC is considering the 8 dBm/MHz PSD limit in its 6 GHz Further Notice of Proposed Rulemaking, there is acknowledgement that the technical record developed in the 6 GHz Report and Order is more than sufficient to justify the increase. Rogers

[37] *See* Comments of Huawei at 5.
[38] *See* Comments of RABC at ¶ 43.
[39] *See* Comments of Shaw at ¶ 50.
[40] *See* Comments of Bell Canada at ¶ 39; *See* Comments of Intel at 6; *See* Comments of Joint Commenters ("We agree with the FCC that the 5 dBm/MHz power spectral density rule is conservative, and support the FCC's proposal to raise the power to 8 dBm/MHz") at 32; *See* Comments of Qualcomm at 5-6; *See* Comments of Rogers at ¶ 112; *See* Comments of Shaw at ¶ 56; *See* Comments WFA at 6.

sums up this view stating, "In our view, a very slight increase of PSD for low-power indoor-only devices should not impact protection of FS links but would still provide a more than worthwhile benefit to licence-exempt operations and Canadian end-users."[41] The DSA agrees with Rogers that the PSD limit of the LPI clients should be 2 dBm/MHz, which is 6 dB below that of the access point.[42]

Additionally, the was broad agreement that ISED should consider the additional measures the FCC implemented to significantly reduce the possibility that LPI devices would not be used exclusively indoors.[43] And even though a contention-based protocol was required by the FCC specifically as a mitigation measure to protect indoor electronic news gathering mobile wireless camera backs operating in the 6425-6425 MHz and 6875-7125 MHz range, there was no objection to ISED also having the same requirement even though such equipment may not be in operation in Canada.

Intel and the Joint Commenters agreed with DSA that the ISED should permit indoor subordinate devices along the lines authorized by the FCC.[44] Intel and the Joint Commenters also agreed with DSA that ISED should permit indoor LPI client-to-client communications, as these will enable important use cases while not increasing the risk of harmful interference to outdoor incumbent operations.[45] Examples of client-to-client operations is Windows 10 PCs "Near Share" feature that allows files, links, photos, and more to be shared by nearby PCs over Bluetooth in the 2.4 GHz band and Apple's AirDrop™, that uses both Wi-Fi and Bluetooth (depending on the product) for similar wireless transfers.

At a high level, the immediate use case of indoor client-to-client communications is allowing faster (lower latency) high-throughput sharing of content over the licence-exempt 6 GHz spectrum. Additionally, the high-bandwidth client-to-client communications possible in the 6 GHz band will be used for increasingly more sophisticated multicasting (screen sharing) that can be used in gaming and other applications. Longer term, indoor client-to-client capability is likely to be incorporated into Augmented Reality / Virtual Reality applications. Most critically, though, through a *de minimus* set of technical rules to ensure that indoor clients are staying close to indoor access points. ISED can support these additional use cases that will improve people lives and benefit the Canadian economy, without increasing the risk of harmful interference to incumbent operations.

[41] *See* Comments of Rogers at ¶ 117.
[42] *See Ibid* at ¶ 112.
[43] These include power supplied from a wired connection, having an integrated antenna, not battery powered, and do not have a weatherized enclosure.
[44] *See* Comments of Intel at 6-7; *See* Comments of Joint Commenters at 33.
[45] *See* Comments of Intel at 6; *See* Comments of Joint Commenters at 33; *See* Comments of the WBA at 7.

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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**

Commenters broadly agreed with DSA that ISED should permit VLP devices to operate both indoors and outdoors across Canada. Even SES thought that the proposal may be acceptable.[46] The one commenter that outright opposed outdoor VLP devices without use of an AFC, did so in its sponsor comment to the RABC filing but took a more modulated approach in its own filing.[47] TELUS contended that outdoor VLP operations at the proposed power levels "would also be problematic in coexistence with fixed backhaul operations in certain deployment scenarios", but did not provide any technical analysis to support its statement. However, TELUS did not argue that ISED should prohibit outdoor VLP operation, but rather issue a public consultation on the usage policy for the band by incumbent services.[48] Its primary issue remained whether VLP devices should be allowed to operate across the entire 6 GHz band or limit to operate only over some portion of it.

There was broad consensus that the EIRP limit should be 14 dBm. Several commenters cited that European and South Korean regulators have authorized VLP with a 14 dBm EIRP limit. There was no opposition to ISED's proposed PSD limit of -8 dBm/MHz. Several commenters agreed with DSA that the PSD limit could be safely increased to 1 dBm/MHz for wideband applications as authorized in Europe and South Korea.[49] The key issue is that Wi-Fi ecosystem participants believe that a PSD of -8 dBm/MHz is inadequate to main VLP budgets, especially for devices operating on 20 MHz channels.[50]

Finally, the RABC filing raised an issue regarding the protection of Globalstar gateway stations from receiving harmful interference due to VLP devices.[51] The RABC filing did not include any technical analysis. Most outdoor VLP devices will be operating in populated areas at ground level where there is clutter. The DSA believes Globalstar can use industry best practices to protect receivers at its two Canadian facilities from outdoor VLP devices.

[46] *See* Comments of SES at 7.
[47] *See* Comment of RABC Sponsor Members (Bell Canada at 2; *See* Comments of Bell Canada at ¶¶ 42-43.
[48] *See* Comments of TELUS at ¶¶ 48-49.
[49] *See* Comments of Intel at 7; *See* Comments of Joint Commenters at 41; *See* Comments of WFA at 7.
[50] *See* Comments of HPE Canada at 13; *See* Comments of the WFA at 7-8.
[51] *See* Comment at RABC at ¶ 47.

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

DSA notes that many commenters agree that a range of business models can support the AFC system, and that there is no need for every device to work with every AFC operator or vice-versa.[52] Allowing flexibility in AFC implementation will be critical to rapid adoption and is the best possible option for allowing consumers to choose the devices, capabilities, and price points that are right for them.

DSA would like to respond to two commenting parties that expressed concerns with potential AFC business models and the fees that AFC operators might charge. The Canadian Association of Wireless Internet Service Providers ("CanWISP") states that its members "oppose business models used by database administrators in the U.S., whereby operators pay the administrator a fee per customer, rather than a fee per base station."[53] The Canadian Electrical Association suggests that, "In areas where an AFC is minimally required due to no other nearby spectrum users i.e. most of Canada's geography, the AFC should be minimally intrusive and burdensome," and that, "AFC fees should be reflective of the service that AFC offers."[54] DSA will respond to each comment separately.

First, in response to CanWISP's concerns, DSA would like to correct the record regarding fees charged by U.S. database administrators. While CanWISP does not specify the frequency band or the database administrator it refers to in its comments, DSA can attest that in the U.S. CBRS band, the majority, if not all, of the SAS database administrators charge fees for their SAS service on a per base station, not end-user device, basis. There is an exception for what is referred to as "high-power CPE," which is the type of equipment typically used in fixed wireless access deployments. Given that these CPEs operate at higher power levels than traditional end-user devices, they must connect to a SAS to receive frequency assignments and instructions to move to a different channel depending on incumbent usage. Therefore, their interaction with the SAS more closely resembles that of a base station rather than an end-user device, which does not interact directly with the SAS, but instead operates under control of a base station that is connected to a SAS. If a device does not require direct connection to a SAS to protect an incumbent or to otherwise effectuate the sharing framework, the SAS administrators do not charge fees for its operation. In this way, the fees charged by SAS administrators are very closely tied to the costs associated with managing access.

[52] *See* Comments of Sony at 3; *See* Comments of Federated Wireless at 5; *See* Comments of Shaw at ¶ 62; *See* Comments of the RABC at ¶ 65.
[53] *See* Comments of CanWISP at ¶¶29-30.
[54] *See* Comments of Canadian Electrical Association at ¶5.

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Second, the Canadian Electrical Association commented on the fees that AFC administrators should charge for devices seeking access to spectrum outside of urban areas where there are likely to be fewer incumbent operators and therefore a reduced risk of interference. ISED, like the FCC, has proposed to require all outdoor and standard power RLAN devices to connect daily to an AFC to ensure that incumbent operations are fully protected – both as they exist today and as they evolve over time. As such, it will be necessary for AFCs to connect to ISED's database daily to download the latest information about incumbent use, recompute interference protections for any incumbent operations that have changed, and communicate those changes to all RLAN devices requesting channel availability information. Given the RLAN industry's preference for a simple AFC that would be easy to implement quickly and the FCC's preference for consistency, uniformity, and ease of enforcement, a centralized approach to the AFC was chosen by the FCC over a de-centralized approach that might have enabled a different refresh period for different devices or locations. Such a simplified, centralized approach necessitates a common refresh rate in order to ensure protection of incumbents. That being said, with multiple, competitive AFCs, the opportunity will exist for differentiation based on fees or other business model approaches.

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.

As mentioned above in response to Question 9, DSA strongly believes that allowing multiple, third-party AFC systems to be certified for operation in Canada, as well as providing flexibility in AFC implementation, will be critical to rapid development and adoption of both AFCs and AFC-connected RLAN devices. DSA also believes that a competitive approach is the best option to allow consumers to choose the devices, capabilities, and price points that are right for them.

Some commenting parties have raised concerns about whether the Canadian market is large enough to attract multiple AFC providers and/or to sustain a commercial AFC system.[55] First, in order to facilitate the rapid introduction of AFC systems and AFC-connected devices, DSA encourages ISED to align its rules as closely as possible with those adopted by the FCC for the U.S. market. Several other commenting parties noted the advantages such an approach would provide.[56] Second, DSA encourages ISED to adopt an approach for certification of AFC systems that will enable multiple third-party systems to apply to demonstrate compliance with ISED's rules, and to keep the opportunity available for new AFC systems to apply for certification in the future beyond any initial application window. By maintaining an open process for future AFC system applicants to use, competitive dynamics should ensure that an AFC system is available for operation in Canada.

[55] *See* Comments of TekSavvy at ¶ 20; *See* Comments of Xplornet at ¶¶ 27-28.
[56] *See* Comments of CanWISP at ¶ 24; *See* Comments of Federated Wireless at 5; *See* Comment of RABC at ¶ 15; *See* Comments of Shaw at ¶ 64.

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

DSA notes that the majority of commenters agree that ISED should adopt an approach similar to the one established by the FCC to ensure operational continuity for existing RLAN devices operating in connection with an AFC. DSA encourages ISED to impose a requirement that if an AFC system ceases operation, it must provide at least 30-days' notice to ISED and transfer any registration data to another AFC system operator.

Q12: ISED is seeking comments on adopting an AFC system model that is harmonized to the maximum extent possible with the AFC system model being implemented in the U.S. and other international markets.

As noted above in response to Question 10, DSA recommends that ISED adopt an AFC system model that is harmonized to the greatest extent possible with the one being implemented in the United States. Numerous other commenting parties also noted the benefits of harmonization with the U.S. approach, including speed to market, economies of scale, cross-border coordination, etc.[57]

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

A number of commenting parties expressed concerns about the need for secure communications between RLAN devices and AFC systems, as well as the need to ensure that information regarding public safety and military licensees be kept private and secure.[58] DSA appreciates these concerns and recognizes that reliable and secure communications are a cornerstone of any successful database-enabled spectrum sharing framework. DSA notes that its members have extensive experience working with entities, including the U.S. Department of Defense, in the context of other spectrum sharing systems, including TV White Spaces, CBRS, and 6 GHz, to ensure that such critical information remains secure and private.

[57] *See* Comments of CanWISP at ¶24; *See* Comments of Federated Wireless at 5; *See* Comments of Sony at 2.
[58] *See* Comments Department of National Defence Frequency Spectrum Management at 3-4; *See* Comments of the Province of Ontario at 2-3; *See* Comments of Shaw at ¶ 66.

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In its Order adopting the 6 GHz rules for the United States, the FCC stated, "We require that AFC systems and standard-power access points employ protocols and procedures to ensure that all communications and interactions between the AFC and standard-power access points are accurate and secure and that unauthorized parties cannot access or alter the database or the list of available frequencies and power levels sent to an access point. These requirements are similar to those adopted for the white space database and the Citizens Broadband Radio Service spectrum access system."[59] The FCC did not, however, mandate specific security protocols or models. Instead, the FCC indicated that it would require any AFC system applicants to demonstrate that their solutions contain communication and information security features during the certification process. The FCC is also monitoring the efforts of standards development organizations, such as the Wi-Fi Alliance and the WInnForum, as well as other multi-stakeholder groups, to develop and implement security protocols for AFC systems. DSA recommends that ISED similarly monitor the security-related protocol development and implementation by these industry groups and that ISED and the FCC consider coordinating on AFC certification processes and requirements.

With regard to the security requirements for information on public safety or defense operations, DSA and its members recommend that ISED work with AFC system applicants to identify ways in which certified AFC system operators can access secure, non-public database(s) containing the information necessary to ensure effective protection. Alternatively, a portal similar to the one used by the U.S. Department of Defense in the CBRS band could be developed for Canadian public safety and defense licensees to notify AFC systems of their operations in need of protection.

Finally, DSA notes that the success of the AFC system in protecting all incumbents will be highly dependent on having accurate information from licensees. ISED should make clear that after an initial updating and correction period is complete, licensees will receive protection via an AFC only for what they have entered in the relevant databases.

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.

Several commenting parties suggested that the AFC should consider aggregate interference impact to incumbent services. DSA notes that this approach was not recommended by ISED in the Consultation. In the FCC's rulemaking proceeding, it decided not to move forward with an

[59] *See* United States Federal Communications Commission, 'Unlicensed Use of the 6 GHz Band, Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz', Report & Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd (2020) at ¶79 ("FCC 6 GHz Order").

aggregate interference protection requirements for incumbent systems, stating that, "designing an AFC system to undertake aggregate power limit monitoring would be very complex…" and that such as requirement, "would require the AFC to have knowledge of each outdoor access point's antenna pattern, orientation, actual transmit power levels, and percent of the time it transmits as well as similar information for unlicensed client devices operating outdoors."[60] Instead, the FCC adopted transmit power limits, contention based protocols, as well as conservative interference protection criteria to ensure that RLAN operations do not negatively impact incumbent systems. Given that the FCC did not require AFC systems to consider aggregate interference when determining frequency availability, it also determined that there would be no need for AFC systems to share information with one another about registered Standard Power or outdoor RLAN access points.[61] DSA supports ISED's plans to adopt a similar approach for 6 GHz RLAN and AFC system operations in Canada.

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

DSA does not have any additional comments on this question.

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

DSA does not have any additional comments on this question.

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

DSA does not have any additional comments on this question.

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.

DSA does not have any additional comments on this question.

[60] *See* FCC 6 GHz Order at ¶ 92.
[61] *See Id*. at ¶ 59.