

March 29, 2017

Mr. Martin Proulx  
Director General, Planning and Standards Branch  
Spectrum, Information Technologies and Telecommunications Sector,  
Innovation, Science and Economic Development Canada  
(Submitted by email: ic.spectrumengineering-genieduspectre.ic@canada.ca)

Dear Mr. Proulx,

**Re: Consultation on the Technical and Policy Framework for Radio Local Area Networks Devices Operating in the 5150-5250 MHz Frequency Band**

The Radio Advisory Board of Canada is pleased to respond the above noted consultation as published in SMSE-002-17.

The attached response was balloted to Board members. nineteen of the RABC's twenty-one members responded as follows: 11 approved, 3 approved with comment, 1 disapproved with comment and 4 abstained.

The Sponsor Members' comments (which form an integral part of the RABC's response) are as follows:

Rogers Communications

*Rogers Communications supports the views of those RABC participants in favour of the use of outdoor and higher power indoor RLAN devices in the 5.2 GHz band.*

NAV CANADA

*NAV CANADA is not in favour of ISED authorizing HPODs use prior to WRC-19.*

Canadian Wireless Telecommunications Association

*CWTA submits its approval of the recommendations put forth within RABC's response to SMSE-002- 17 where CWTA's Members have unanimously agreed on the positioning outlined therein. However, CWTA's approval does not include any such instances where CWTA's Members are not in agreement.*

Canadian Satellite and Space Industry Forum

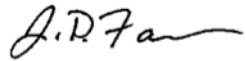
*CSSIF supports the comments and views espoused within the RABC Response to ISED; specifically the concerns raised and comments associated with the RABC participants collectively 'not in favour' of rule changes related to the use of 5 GHz prior to WRC-19.*

*CSSIF members are particularly concerned about increased interference and CSSIF encourages further independent and technically comprehensive studies before any rule changes are made.*

*CSSIF is opposed to policy or rule changes at this juncture – and the precedent such a policy or rule change may set – since it believes that any ruling by the Department at this time on spectrum issues related to WRC-19 Agenda Item 1.16 may 'pre-judge'; results of studies within the WRC-19 Canadian Preparatory Committee, Canadian proposals and positions for the Conference, and the outcome of the Conference.*

Finally, attached and included with the RABC response, is an Industry Canada presentation regarding the potential impact of outdoor Wi-Fi devices operating in the band 5150-5250 MHz on NGSO satellite networks. The presentation is submitted to the Department in confidence. The Board appreciates the opportunity to respond to this important notice.

Sincerely,

A handwritten signature in black ink, appearing to read "J. D. Farnes", with a stylized, flowing script.

J. David Farnes  
General Manager

Attachments (2)

## **RABC Response to ISED**

**RE: SMSE-002-17**

### **Consultation on the Technical and Policy Framework for Radio Local Area Networks Devices Operating in the 5150-5250 MHz Frequency Band**

#### **Introduction and Executive Summary**

1. The RABC is pleased to provide its comments regarding the above noted consultation.
2. Significant interest in the consultation was expressed by a broad representation of RABC Sponsor Members, members of RABC Sponsor Members and non-members. The RABC established a special working group to develop a response to the consultation. The working group was chaired by the Chair of RABC's Fixed Wireless Communications Committee. Membership included participation by the following RABC Sponsor Members and their members: Bell Canada, Blackberry, Boeing, Canadian Association of Broadcasters (CAB), Canadian Space Agency, Canadian Association of Wireless Internet Service Providers (CanWISP), Canadian Electronics and Communications Association (CECA), Cisco Systems Inc., Defence Canada, Ericsson Canada Inc., Globalstar, Quebecor Media, Rogers, Shaw Communications, SaskTel and TELUS. Non-member participation included Environment and Climate Change Canada (ECCC) and Transport Canada.
3. All stakeholders agreed that ISED's mandate is to manage the scarce spectrum resources in Canada to maximize their use for the benefit of all Canadians and to promote the public interest. It was not possible to get consensus on the question raised by the consultation. In order to properly represent the two views, RABC feels it is important to clearly distinguish the supporters of RLAN rules changes prior to WRC-19 in 5150-5250 MHz and from those not in support of the rule changes. Therefore, unless indicated otherwise in the text, the term "RABC participants in favour" will refer to working group members proposing to support use of HPOD devices and "RABC participants not in favour" will refer to working group members not supporting use of HPOD prior to WRC-19. RABC participants in favour are composed of mobile services providers, wireless internet services providers, internet service providers and vendors. RABC participants not in favour are composed mainly of satellite services providers and users from different government agencies.
4. Upon initial review of the consultation document, the interpretation of some members of the RABC was that the Department was seeking comments on only "outdoor" devices (in reference to HPOD in the consultation paper). However, examination of paragraph 21 of the consultation paper indicates that the topic of HPOD under discussion refers to "outdoor **and** higher power indoor RLAN devices" (emphasis added), as opposed to "high power outdoor devices". Clarification with the Department during the RABC working group discussions confirmed that potentially permitting the use of higher power indoor devices (beyond what is currently authorized in Spectrum Policy SP-5150) was in scope and comments would be appropriate. Therefore, unless specific mention is made to outdoor devices or higher power indoor devices, the RABC comments on HPOD address both indoor and outdoor devices. Following this clarification, one RABC participant in favour submitted that it is in favour of rule changes for outdoor RLAN devices prior to WRC-19, but not in support of changes to the rules for higher power indoor devices.

5. RABC participants in favour see demand for, and benefit from allowing, HPODs in the 5150-5250 MHz frequency band and submit that protective measures similar to those taken by the FCC in the U.S. may be deployed as long as it protects incumbent services against any potential of harmful interference. RABC participants not in favour believe the risk of potential harm from interference to incumbent services outweighs the potential benefit of allowing HPODs, at least until after determinations are made at WRC-19.
6. Finally, some members of both views were open to some form of licensing, or light licensing, of HPOD devices to ensure protection of incumbent services, should the Department decide to proceed with authorizing such devices prior to WRC-19.

### Specific Comments Regarding three points raised by the Department

#### ***A. the demand for and benefit, if any, of allowing HPODs in the 5150-5250 MHz frequency band***

7. As explained more fully below, RABC participants in favour see demand for, and benefit from allowing, HPODs in the 5150-5250 MHz frequency band. RABC participants not in favour believe the risk of potential harm from interference to incumbent services outweighs the potential benefit of allowing HPODs, at least until after determinations are made at WRC-19.
8. RABC participants in favour agree with the sentence provided in paragraph 20 of the consultation paper related to the expectation of the proliferation of RLAN devices in the coming years. In addition to the reference to data from Cisco<sup>1</sup> in the consultation, they referred to studies indicating that Wi-Fi continues to be one of the fastest growing elements of the wireless market.<sup>2</sup> For example, in 2015, global Wi-Fi traffic was 55.2% of total aggregate Internet traffic and is planning to reach 59.1% of total aggregate Internet traffic in 2020.<sup>3</sup> Also, in 2016, 60% of total global mobile data traffic was offloaded to Wi-Fi or femtocell and it is foreseen to continue climbing to reach 63% by 2021.<sup>4</sup>
9. For Canada specifically, RABC participants in favour stated that the growth rates for Wi-Fi usage often exceed those indicated above. According to Cisco's forecasts<sup>5</sup>:
  - Wi-Fi use in Canada will reach 2.1 Exabytes per month in 2020, up from 698 Petabytes per month in 2015 and will grow at a compound annual growth rate of 24% during this period;
  - Wi-Fi represented 57.6% of total Internet traffic in 2015 and will rise to 64.9% of total Internet traffic in 2020. This will be 2.6X the amount of fixed/wireline Internet.
10. RABC participants in favour indicated that they individually and collectively serve many millions of Canadian consumers and businesses with broadband services.
11. RABC participants in favour stated that in the 2.4 GHz band, the most popular RLAN band, congestion has become critical, rendering this spectrum virtually unusable to deliver ultra-high-

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<sup>1</sup> SMSE-002-17.

<sup>2</sup> ABI Research: <https://www.abiresearch.com/market-research/product/1026732-wi-fi/>

<sup>3</sup> [http://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html](http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html)

<sup>4</sup> <https://newsroom.cisco.com/press-release-content?type=webcontent&articleId=1819296>

<sup>5</sup> [http://www.cisco.com/c/m/en\\_us/solutions/service-provider/vni-forecast-highlights.html#](http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html#). From the "North America" pulldown menu, select Canada.

speed Internet services and applications, such as video streaming and conferencing, that ISPs can offer to their customers. Additionally, they stated that the latest Wi-Fi technology designed for gigabit speed, known as 802.11ac, which is already beginning to dominate the wireless connectivity market, operates in the 5 GHz but not in the 2.4 GHz band. As a result, usage is now growing rapidly in the 5 GHz band. Until the Canadian rules for RLAN use of the 5150-5250 MHz band are harmonized with the rules in the U.S., Canadians will not be able to experience the full potential of 802.11ac. The higher power levels and wider channels required for 802.11ac are needed in order to deliver gigabit speeds to Canadians.

12. RABC participants in favour noted that, as of March 2017 there have been over 1,000 devices certified in the U.S. to take advantage of the new rules<sup>6</sup>. Also, according to NCTA, which has provided data compiled from U.S. cable operators, there was as of December 2016 17.3 million total public access points in the U.S. and 72.4% of those (12.5 million) were using the 5150 – 5250 MHz band<sup>7</sup>. Given that this data relates only to the cable industry, there could be more access points in the U.S. that use the 5150-5250 MHz band.
13. RABC participants in favour noted that outdoor RLAN devices are used to provide low cost connectivity to users for backhaul, in addition to high speed internet services. The 5.8 GHz band is used for both backhaul and multipoint services, and as the demand for bandwidth continues to increase, congestion is experienced as indicated by the Department in paragraph 21 of the consultation paper.
14. RABC participants in favour are proposing to modify Canadian technical rules in 5150-5250 MHz to harmonize with the ones adopted by the FCC in 2014 for both outdoor and indoor devices (note: for reference, a graph is provided in Appendix 1, providing spectrum channels availability for RLAN under current Canadian rules and the rules in the U.S. following changes adopted in 2014). The benefits in their view would be to:
  - Help to meet the spectrum demand associated with RLAN use and enhance customer experience with evolving applications, such as 4K, by making available another 100 MHz of contiguous spectrum and enabling Canada's first IEEE 802.11ac based 160 MHz-wide indoor channel in the lower part of the band (within 5150-5350 MHz as shown in Appendix 1. This would allow ISPs to offer to Canadians speeds of up to and beyond 1 Gbps supporting those applications.
  - Improve the transmit reach of all 20, 40 and 80 MHz channels in the band, translating into a material improvement in coverage in the home and other indoor locations, as well as helping to alleviate the looming performance and congestion challenges.
  - For outdoor device use, enhance connectivity in areas such as municipal parks, small town main street, outdoor stadiums and local and national transit systems. Enabling the full potential of 802.11ac for outdoor Wi-Fi and other unlicensed use, and rapidly developing, connectivity platforms. Specifically, it would assist:
    - i. CanWisp operators delivering cost efficient high speed Internet as they rely heavily on unlicensed bands to do so and congestion is experienced in the 5800 MHz band as indicated in paragraph 12 above
    - ii. CAB members to support deployment of point to point IP audio/video links, as 5 GHz broadcast available equipment can operate in this frequency range

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<sup>6</sup> See FCC's Office of Engineering and Technology datasite (<https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm>)

<sup>7</sup> Obtained from NCTA via CableLabs

- iii. Meet the higher capacity demands of outdoor RLAN deployments where people tend to gather in dense crowds, driving usage and congestion risk
  - Ensure that Canadian consumers and businesses have access to equipment available in the U.S that provides the most recent innovations and enable leading connectivity experiences that respond to increasing demands for robust and reliable Wi-Fi, as well as current and future connectivity innovations.
15. RABC participants in favour stated that the technical benefits described above will have profound implications for the indoor connectivity experiences of Canadians, whether in homes or offices, by increasing the throughput and range of their Wi-Fi access, ensuring that they are able to experience the speeds and quality of Canada's increasingly powerful wireline networks.
  16. CAB added the importance to differentiate between point-to-point applications and hotspot applications for outdoor device in 5150-5250 MHz. For point to-point applications, CAB indicated that it expects that its equipment would comply with FCC rules.
  17. CanWISP network operators indicated they are in great need of spectrum to supply more throughput to their customers. At the moment, they only have 125 MHz in the 5.8 GHz band (5725 - 5850 MHz) where higher e.i.r.p. can be used especially for point-to-point links. A lot of WISPs are using this band to do both backhaul and distribution and since the demand in throughput is always increasing, the band is not sufficient anymore.
  18. RABC participants not in favour stated that the risk of potential harm from interference outweighs the potential benefit of allowing HPOD devices, at least until after determinations are made at WRC-19. These members question the accuracy of studies predicting the significant growth in outdoor and indoor devices – and in particular the demand for outdoor services.
  19. RABC participants not in favour disagree with the studies indicating large demand for public and home WiFi hotspots. As shown in the Appendix 1 chart below, Canadian WiFi operators can already use the available 22 WiFi channels in Canada, 18 for indoor/outdoor use, and 4 (5150-5250 MHz) for indoor use only. The proposed changes to the Canadian regulations would not increase the number of indoor WiFi channels, and so it is RABC participants not in favour's view that the growth in Canadian WiFi demand, mainly indoor, can already be met with the 22 WiFi channels today. It was also stated that the major change which will cause interference to the satellite systems is to allow the use of outdoor devices in 5150-5250 MHz band up to 4 watts. In RABC participants not in favour's view, Canadian WiFi operators have not given specific data that the demand for outdoor WiFi use requires changes to the Canadian regulations prior to WRC-19, only two and a half years away.
  20. RABC participants not in favour are of the view that it is important to make sure equipment proposed for deployment in 5150-5250 MHz, such as suggested by CAB in paragraph 16, fulfill all Canadian regulatory and technical requirements related to 5150-5250 MHz.

***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 e.i.r.p of 4W. Requirements for an elevation mask towards satellites and an exclusion zone of 25 km around receiving earth stations to protect all satellite systems would likely also apply.***

21. The RABC held a number of working group meetings between January 15, 2015 and March 11, 2015 to review the studies conducted by CableLabs (US)<sup>8</sup>, Globalstar<sup>9</sup>, and ISED<sup>10</sup> on the interference from RLAN into the satellite systems based upon the US rules adopted in 2014. All the studies showed the increase in thermal noise to the satellite would exceed the allowable interference level of 3%  $\Delta T/T$  as stated in ITU-R Recommendation S.1427-1: "in the band 5150-5250 MHz the aggregate  $\Delta T/T$  from WAS/RLAN emissions should be no more than 3%". In summary, the CableLabs study showed the interference to be 1.12 dB (29%  $\Delta T/T$ ), the Globalstar study revealed 2 dB (58%  $\Delta T/T$ ) and the ISED study showed the 3%  $\Delta T/T$  would be exceeded 45-90% of the time, depending on satellite systems consideration.
22. RABC participants not in favour are of the view that it is recognized that any interference or noise can be picked up by a receiver and contributes to the overall system noise. They indicate a statement that "the existence of noise does not constitute harm" is inaccurate. It is further noted that the dynamic noise margins are greater than the static ones<sup>11</sup>.
23. The studies by CableLabs and Globalstar were based on estimates of the number of outdoor Access Points (AP's) in the US to be 3.12 million (the CableLabs study) and 4.4 million (the Globalstar study). Since the band 5150-5250 MHz is licence exempt, it's difficult at this time to know which one is the most realistic. New services, applications, and even new signal technologies (e.g. LTE-U, which is still being studied within ITU-R for sharing with other services in the 5 GHz frequency range), are being developed each day for these licence exempt bands. The potential for interference into the satellite networks is not for one or two systems, but it's the aggregate of all the RLAN devices operating within the footprint of the satellite receive antenna.
24. In Canada, the Mobile Satellite operator in the 5150-5250 MHz band is providing satellite voice communications, messaging and emergency satellite notification services. One of its services, called SPOT provides emergency communications in rural and remote regions of the world. In 2016 SPOT set a new safety record with 274 rescues initiated in Canada. To date, an estimated one-third, or 30% of all SPOT rescues worldwide have been initiated in Canada. The implementation of appropriate domestic and international regulations to minimize the interference into this satellite network is critical to the provision of this service.
25. Transport Canada noted that permitting the use of outdoor devices at an e.i.r.p. of 4W, times the number of deployments, could cause an increase in the aggregate noise seen by a satellite receiver, and thus impact network capacity and availability. Concern was also expressed on the future sustainability of the 5150-5250 MHz band under an unlicensed regime with no regulatory control over deployment levels. An aviation standards body is currently developing technical operating criteria for airborne systems that will be used to support Unmanned Aircraft Systems. These systems will use ARNS allocations under 4.10 of the Radio Regulations, one of these ARNS allocations is in the 5150-5250 MHz band.
26. ECCC is concerned about 5150-5250 MHz out-of-band emissions into the band 5250-5350 MHz that will be used on planned Synthetic Aperture Radar (SAR) missions. Currently an estimated 60% of RADARSAT data is used by 37 government programs for operational purposes. The

<sup>8</sup> <http://www.rabc-cccr.ca/Files/5954720140815%5Fspectrum%20sharing%20TPRC%5FFINAL%2Epdf>

<sup>9</sup> <http://www.rabc-cccr.ca/Files/RABC%2D%20Globalstar%2DRoberson%202%2E26%2E15%20rev%204%2Epdf>

<sup>10</sup> Submitted in confidence to ISED.

<sup>11</sup> See "Static and Dynamic Noise Margins ..." by J. Lohstron, IEEE J. of Solid-State, Vol -14, June 1979

remaining 40% will be used for Research and Development purposes. ECCC is a very significant user of Radarsat data, for example in support of the mission of the Canadian Ice and Marine Services, for oil pollution monitoring, for climate modelling, for the SARWind project and for ecological monitoring in national parks. As science knowledge and computing capabilities expand rapidly, the government programs, including those of ECCC, will critically count on the higher resolution data that future CSA SAR missions will provide in the 5 GHz (5250-5470 MHz). The integrity of that data must be ensured.

27. Paragraph 21 of the consultation states that the Department has received interest from Canadian stakeholders to use 160 MHz channel bandwidth operating outdoor in both 5150-5250MHz and 5250-5350 MHz. The RABC participants not in favour stated that the Canadian Radarsat satellite networks use SAR technologies at 5 GHz, allowing 24-hour data collection, regardless of atmospheric or sunlight conditions, which makes this data ideal for use in mapping projects where persistent cloud cover or darkness impede acquisition by optical imaging systems. SAR sensors can have different viewing angles that allow a wide range of significant target properties, value-added applications and ground coverage requirements to be accommodated. It has been acknowledged that Radarsat has been the most efficient and effective satellite sensor for detecting flood damages and oil spill due to its sensor's capability of providing interpretable information for first responders in disaster situation environments. The 5 GHz band used by the Radarsat series of satellites is well suited for SAR imaging. The C-band wavelength is well-suited to provide, by the reflected and scattered signal properties, details of surfaces being imaged, such as forest fire detection, flood delineation and vegetation monitoring. Canada's next generation Radarsat is planned to utilize 5250-5350 MHz in order to improve the image resolution and surveillance mechanism used to exert Canadian sovereignty over its territory and its natural resource, as well as to provide necessary security for all Canadians.
28. Therefore, in reference to paragraphs 11 and 14 above, RABC participants not in favour expressed great concern about the aggregate RLAN out of band emission from HPOD devices operating in the band 5150 - 5250 MHz and the potential resulting interference into Radarsat satellite network footprint above 5250 MHz which could result in significant image degradation. The degradation could occur if the Department permits the use of outdoor RLAN devices operating in the band 5250-5350 MHz outside the framework defined by Resolution 229 (Rev WRC-12).
29. RABC participants not in favour are of the view that it is unclear as to the effectiveness of the FCC rules, stating the apparent lack of interference complaints which in their opinion may be due to the low level of proliferation of 5 GHz RLANs in the US to date.
30. RABC participants not in favour noted the size of Canada and its population, which is only about 10% of that of U.S., and, as a result, are of the view that Canada does not need to allocate as much spectrum to RLAN devices as in the U.S.
31. In reference to the clarification provided by the Department that consideration of higher power indoor RLAN devices were in scope and comments would be appropriate, RABC participants not in favour considered the indoor usage as an important factor in the aggregate interference into the satellite networks, especially noting that the majority of private/domestic usage in their view would not require more than the power defined in Resolution 229.
32. RABC participants not in favour also highlighted that exclusion zones do not mitigate potential interference from RLAN devices that would operate within the footprint of satellite receive antennas.
33. RABC participants not in favour submit that once consumer unlicensed devices cause harmful interference to the operation of incumbent services, it would be impossible to resolve the interference.



34. RABC participants in favour indicated they were not aware of any interference-related complaints to the FCC regarding the outdoor device operation of RLANs in the 5150-5250 MHz frequency range, notwithstanding the fact that devices have been deployed. They continued by noting that RLAN devices deployment in the US would understandably be significantly higher than that of Canada simply based on the relative population of the two countries. With regards to any potential out-of-band emissions, they noted that the FCC maintained absolute level out-of-band emission limits so as not to increase the interference risk to systems in adjacent bands.
35. RABC participants in favour noted that a static noise-level threshold referred to in paragraph 22 above, absent further analysis, is an insufficient basis for determining harm and that the existence of noise does not constitute harm – it must be shown to be detrimental to the operation of the system. In their view, the only analysis on record that has endeavoured such an approach is that of CableLabs, which concluded there would be no system impact from greater use of the 5150-5250 band.
36. The RABC notes that the Department clarified during the working group discussions that there is currently only one earth station in operation in Canada within 5150-5250 MHz and that the Department will ensure its protection while minimizing impact to other services using the same band.

**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 futures services in the 5150-5250 MHz frequency band? Also, indicate any and all considerations that should be given to equipment standards, technical requirements, eligibility criteria and/or conditions of licence depending on the relevant approach.**

37. RABC participants in favour are of the view that although the ITU has not yet decided on potential changes to technical rules for the operation of outdoor and indoor devices in the 5150-5250 MHz frequency band, it would not be spectrally efficient, or in the public interest, to wait until after WRC-19 is over before developing rules for Canada for the reasons mentioned in response to Question A above.
38. RABC participants in favour stated that other members of the international community have recognized the need to reform their technical rules for RLANs operating in the 5150-5250 band. For example, in the United Kingdom, a report for the UK Spectrum Forum is proposing to “removing the current restrictions on use of Wi-Fi systems outdoors in the 5150–5350MHz band” with the understanding that it “will require European and/or international agreement and hence are the subject of study leading up to WRC-19”<sup>12</sup>. Likewise, in December 2016, Panama modified its national frequency allocation plan (Plan Nacional Atribucion de Frecuencias) to reflect the same reforms undertaken by the U.S.<sup>13</sup>.
39. RABC participants in favour recommend that the Department remove the restrictions on the outdoor use of RLANs in the 5150-5250 MHz portion of the band and align the permissible power level of such devices to the levels adopted by the FCC in outdoor settings. Most of the RABC participants in favour are also of the view that the Department should increase the permissible power level of indoor devices to the level adopted by the FCC.

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<sup>12</sup> <http://www.techuk.org/about/uk-spectrum-policy-forum>

<sup>13</sup> Resolucion AN No. 10789-Telco, Panama, 21 de diciembre de 2016.








40. It is RABC participants in favour's view that the recommendation in paragraph 39 would likely necessitate the creation of a practical and pro-active solution which could take some form of licensing to HPOD devices use that would protect incumbent services. This could lead to establishing efficient technical and administrative safeguards to shield existing and future incumbent services systems from harmful interference. They suggest that the FCC's approach appropriately balanced the timely deployment of HPOD devices with the protection of other services in the band by imposing elevation mask and registration requirements that allow the tracking of major deployments of such devices in the event that corrective action is required. It is also stated by RABC participants in favour that similar to the FCC rules for higher power RLANs, there would be no change to the requirement that all RLAN devices would continue to be authorized for operation on a "no interference no protection basis". It would offer an opportunity to prudently and constructively build Canada's national knowledge-base for purposes of making concrete and proactive submissions to WRC-19.
41. WISPs would benefit from a 4W EIRP technical requirement as it matches the current requirements for the 5.8 GHz band on a multipoint system. However, higher power could be used for point-to-point links given that a better elevation mask is mandated. In fact, the US rules allow for a higher EIRP (53dBm) for point-to point installations. Contrary to the US, CanWISP believes that at that power level, higher performance dishes must be used to minimize the power at higher elevation angle. Using this band for point to point backhaul between towers would free up 5.8GHz spectrum for Multipoint systems.
42. CanWISP is in favour of a licenced approach for outdoor devices, while keeping the current rules in place for indoor devices. In its view, there is fear that allowing higher power for indoor consumer devices may lead to interference to outdoor licenced devices. With a licenced approach for outdoor device, CanWISP believes that authorized service providers can operate under the rules that the Department may decide to proceed with and ensuring appropriate operation in 5150-5250 MHz.
43. In contrast, wireline ISPs leveraging WiFi for in home distribution are seeking ways to achieve a material improvement in coverage and call on the Department to address this important need.
44. If the Department decides to proceed with authorizing outdoor and indoor devices, RABC participants in favour anticipates that the next steps identified in point C of consultation's paragraph 29 would be revision of RSS-247 and RSS-Gen.
45. RABC participants not in favour note that if there is a proliferation of unlicensed outdoor and indoor devices in Canada, then there will be no practical means of removing devices from the market should interference become an issue.
46. RABC participants not in favour emphasized that in their view any ruling by the Department on the spectrum subject to Agenda item 1.16 of WRC-19 at this time would pre-judge the results of studies within the CPC in preparation for WRC-19, the Canadian position before the start of the Conference, and the outcome of the Conference.
47. RABC participants not in favour wonder about the usefulness of adopting new domestic regulations now if they are most likely going to be revisited in 2-3 years from now.
48. RABC participants not in favour stated that while the UK has issued a consultation process, there have been comments stating concerns in implementing changes prior to WRC-19 and no Decision has been made yet. In addition, RABC participants not in favour noted that there are many CITELE countries that are still reviewing their positions on Agenda Item 1.16 of WRC-19 that addresses the use of RLAN in 5 GHz.
49. RABC participants not in favour also noted that in their view the FCC's decision does not specify the specific protection level that is provided to the satellite operator and the decision only states the

possible corrective action the FCC might take. They continued by stating that the US approach of reacting to interference if it arises is unrealistic and impractical, especially in the deployment of licence exempt devices, and even more so internationally as such a regulatory approach is in their view impossible to implement.

50. Some RABC participants not in favour emphasized that due to the importance of the Canadian Radarsat satellite networks to all Canadians, they are very concerned about the out of band emission from outdoor devices operating in the band 5150 - 5250 MHz and the resulting interference into Radarsat satellite network. To ensure protection of Radarsat, it proposed to refrain deviating from ITU-R Resolution 229.
51. As a result, RABC participants not in favour urged the Department to avoid making any decisions contrary to the current regulatory regime. They recommend that the department should wait until the studies for WRC-19 are complete and the results of WRC-19 are known, so a better understanding of the deployment in these unlicensed bands can be properly assessed, especially from the point of view of the aggregate interference into the satellite networks.
52. Nevertheless, if the Department proceeds to authorize HPOD devices use prior to WRC-19, RABC participants not in favour indicated consideration should be given to the impact these regulations would have on the proposals/positions which Canada would take to the WRC.
53. If the Department decides to proceed with authorizing outdoor devices, Transport Canada would favour a licenced approach as this would serve as a regulatory mechanism to control emissions in the 5150-5250 MHz band, and to ensure that any out of band emissions below 5150 MHz and do not impact adjacent primary aeronautical services operating communications links transporting traffic used by NAV CANADA in the 5091-5150 MHz band.

Respectfully submitted by the RABC, March 29, 2017.

## Appendix 1

Frequency (MHz)	5150	5250	5350	5470	5600	5650	5725	5850	5925
Band Designation	U-NII-1 (100 MHz)	U-NII-2A (100 MHz)	U-NII-2B	U-NII-2C (130 MHz)	Weather Radar (50 MHz)	U-NII-2C (75 MHz)	U-NII-3/ISM (125 MHz)	U-NII-4	
								25 Indoor/Outdoor 1W+ Channels	
								18 Indoor/Outdoor 1W+ Channels 4 Indoor 200mw Channels	
Max. EIRP	4W/1W* US 200 mW CA	1 W		1 W			4W		
Subject to elevation mask for outdoor use?	US: Yes (FCC) CA: not yet available	Yes (Res 229 and RSS 247)	No	No			No	No	
Uses	In/Outdoor US Indoor only CA	Indoor- Outdoor	[EESS/Radarsat, SRS, Radiolocation]	Indoor-Outdoor			Indoor-Outdoor	[FS, MS, FSS & ISM]	
DFS	No	Yes		Yes			No		
TPC	No	Yes		Yes			No		

\* 4W for fixed AP's; 1W for client devices

DFS Dynamic Frequency Selection

EESS Earth Exploration Satellite Services (e.g., Radarsat)

EIRP Effective Isotropic Radiated Power

FS Fixed Services

FSS Fixed Satellite Services

ISM Industrial, Science & Medicine

MS Mobile Services

TPC Transmit Power Control

U-NII Unlicensed National Information Infrastructure