

**Reply Comments of Shaw Communications Inc.**

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

***Canada Gazette*, Part I, January 28, 2017, Notice No. SMSE-002-17**

**April 12, 2017**

## I. Introduction

1. The following constitutes the reply comments of Shaw Communications Inc. (“Shaw”) to Innovation, Science and Economic Development Canada (the “Department”) in connection with the proceeding initiated by *Consultation on the Technical and Policy Framework for Radio Local Area Network Devices Operating in the Band 5150-5250 MHz*, Notice No. SMSE-002-17 (the “Consultation Document”).<sup>1</sup>
2. Shaw has reviewed the comments that were filed by interested parties in this proceeding and notes that there is extremely broad support for the Department to authorize the operation of higher power indoor and outdoor RLAN devices in the 5150-5250 MHz frequency band in Canada, and to do so in a manner that aligns with the approach that was adopted in 2014 by the Federal Communications Commission (FCC) in the United States. In fact, the vast majority of parties that submitted comments in this proceeding agreed that Canada should take steps to authorize these devices now, rather than wait until after the proceedings associated with WRC-19 are concluded. Among the parties that submitted comments in favour of this approach were: ABC Communications, Bell Canada (Bell), CableLabs, CanWISP, the Canadian Electronics and Communications Association (CECA), Cisco Systems, Inc. (Cisco), Cogeco Communications Inc. (Cogeco), the Canadian Urban Transit Association (CUTA), Ericsson Canada Inc. (Ericsson), the IEEE 802 LAN/MAN Standards Committee (802 Standards Committee), Intel Corporation (Intel), Microsoft Corporation (Microsoft), Nokia, the Public Interest Advocacy Centre (PIAC), Québecor Media (Quebecor), Rogers Communications Canada Inc. (Rogers), Ruckus Wireless (Ruckus), the Telecommunications Industry Association (TIA), TELUS Communications Company (Telus), the Wi-Fi Alliance, and the Wireless Broadband Alliance (WBA).
3. Several of these parties represent large industry associations and alliances, such as the CECA, the TIA, the WBA, the WiFi Alliance, the LAN/MAN Standards Committee and CableLabs, which each has memberships in the hundreds. In actual fact, therefore, the number of parties that support the harmonization of Canada’s rules for higher power RLANs with those in the United States would need to be multiplied many times over in order to reflect all of the members of these organizations.
4. These proponents for rule changes (the “proponents”) point to the numerous studies and evidence that has been compiled which demonstrates the tremendous demand for additional spectrum for use by Wi-Fi and other RLAN devices, not only at the international level, but also here in Canada as well, where demand is actually outpacing the international trends. In fact, so

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<sup>1</sup> Shaw’s understanding is that the Consultation Document (e.g. paragraph 21) contemplates both indoor and outdoor use of RLANs in the 5150-5250 MHz band at increased power levels.

great is this demand that It has been estimated that countries will need to add between 500 MHz and 1 GHz of new spectrum for RLANs by 2025 in order to keep pace with the growing demand.

5. The proponents also provide compelling and irrefutable evidence of the social, economic and technical benefits that are associated with RLANs, particularly the critically important role that Wi-Fi plays as the “workhorse” in our digital economy. Noted economists and scholars are unanimous on the economic benefits associated with unlicensed spectrum, with one study concluding that the total economic gain to all households worldwide from Wi-Fi access is roughly \$52 to \$99 billion per year and, in Canada, it is estimated that we would require 27,000 additional cell phone sites in the absence of Wi-Fi offloading.
6. There were a handful of parties in this proceeding that were generally opposed to making any changes to Canada’s 5150-5250 MHz rules for higher power RLANs prior to WRC-19 (the “opponents”). These parties include the Canadian Space Agency (CSA), GlobalStar Canada Satellite Co. (GlobalStar) NAV Canada, Transport Canada, Environment and Climate Change Canada (ECCC) and Parscom Management.
7. In these reply comments, Shaw provides its responses to the concerns that have been raised by these particular parties. Shaw notes there have been no interference concerns since the FCC proceeded with similar reforms to the 5150-5250 MHz band, and the Department has proposed a light-licensing approach and measures that will further mitigate any risk of harmful interference. It is also important to note that, even some of the opponents, most notably Transport Canada and NAV Canada, stated that they were amenable to the Department’s proposed “licensing approach” for higher power RLANs as described in paragraph 27 of the Consultation Document.
8. This is encouraging because all of the available evidence points to the fact that Canada cannot wait another few years for the conclusion of WRC-19 proceedings (and all of the studies associated with Agenda Item 1.16) to be completed before taking steps to deal with higher power RLAN devices in the 5150-5250 MHz band. As reiterated in the Consultation Document, the overall objective of the Department’s mandate is to maximize the economic and social benefits of the radio frequency spectrum resource in the public interest.<sup>2</sup> With this criterion in mind, it is crucial for Canada to proceed with the reforms. The surging demand for Wi-Fi spectrum here in Canada, coupled with the high degree of integration between the Canadian and US markets, including our telecommunications networks and equipment ecosystems, makes it impossible to ignore this issue.

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<sup>2</sup> <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08776.html>

9. There is a critical need to address this issue now because, as each day goes by, the overall competitiveness and comparative advantage of our digital economy is adversely impacted by the delay in harmonizing our rules with those of the United States. Canadian consumers are particularly impacted by this delay. In particular, and despite the fact that many homes and businesses are now served by – and, indeed, pay for – wireline Internet access services that deliver gigabit speeds, they cannot experience those speeds because they are not permitted to operate higher power RLANs. As Cogeco noted:

*Cogeco has built its wireline network to keep pace with this demand, incorporating gigabit Internet speeds, but its Wi-Fi network cannot match those speeds if it cannot activate 802.11ac technology in the network. Likewise, as long as the indoor use of HPODs is prohibited in Canada, Cogeco's customers will likely not be able to experience these speeds with their Internet routers.<sup>3</sup>*

10. A number of the service providers that submitted comments in this proceeding, including Bell, Telus, Rogers, Shaw and Cogeco, indicated that they have already been impacted by this “disconnect” between the Canadian rules for higher power RLANs and those of the United States. As noted by Telus:

*...the use of different regulatory limits between Canada and the US have forced TELUS and other service providers into difficult compromises in specifying equipment with their vendors which are designed for Canadian consumers. Under disparate regulations such as the 5150-5250 MHz power limit rules, we are forced to either a) sacrifice performance by using hardware designs intended for the US market but with firmware adjustments that attempt to provide best device performance while complying with Canadian domestic technical requirements, or b) increase cost and delay time-to-market by customizing hardware designs for the Canadian market.<sup>4</sup>*

11. As some parties have pointed out, this “disconnect” raises additional concerns, including the growing spectre of a gray or black market in higher power RLAN devices developing here in Canada. As noted by Bell: “...it is inconceivable that the HPOD devices that are presently being used and deployed in the U.S. will not make their way into Canada”, and “we are unaware of any mechanism that is at the government's disposal that would preclude consumers and small business owners from importing and using this equipment in Canada.”<sup>5</sup>

12. We need to develop a proactive solution, which addresses the burgeoning demand for additional Wi-Fi spectrum by Canadian consumers and businesses by developing a path forward that

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<sup>3</sup> Comments of Cogeco Communications, SMSE-002-17, 29 March 2017, para 14.

<sup>4</sup> Comments of Telus Communications Company, SMSE-002-17, 29 March 2017, para 18.

<sup>5</sup> Comments of Bell Canada, SMSE-002-17, 29 March 2017, p. 3.

addresses this demand, while at the same time protecting incumbent users consistent with our international obligations.

## II. The Social, Economic and Technical Benefits of Wi-Fi Spectrum are Undisputed

13. Before responding to the specific concerns that were raised by parties that are opposed to making any immediate changes to Canada's RLAN rules, below we summarize the extensive evidence that was tendered in this proceeding which supports the harmonization of our rules with those in the United States in advance of WRC-19. This evidence not only demonstrates that the demand for Wi-Fi spectrum is more significant in Canada than in other parts of the world, but that there are several, well-documented social and economic benefits to consumers and businesses that are directly linked to Wi-Fi use and government policies that support this spectrum.

### ***Demand for Wi-Fi spectrum is projected to continue to increase substantially within the next five years***

- Wi-Fi traffic in Canada is projected to rapidly rise from 57.6 percent of all Internet traffic in 2015 to 64.9 percent in 2020, which is higher than the global percentage.<sup>6</sup>
- By 2020, it is estimated that Canada's fixed/Wi-Fi Internet traffic will be 2.6 times larger than fixed/wired Internet traffic.<sup>7</sup>
- The number of Wi-Fi hotspots in Canada will jump from 0.8 million in 2015 to 10.2 million in 2020.<sup>8</sup>
- Wi-Fi use in Canada will reach 2.1 Exabytes per month in 2020, up from 698 Petabytes per month in 2015.<sup>9</sup>
- By 2021, it is estimated that 75 percent of Canada's mobile data traffic will be offloaded onto Wi-Fi networks.<sup>10</sup> The global average for daily data consumption over Wi-Fi is four times higher than over cellular networks.<sup>11</sup>

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<sup>6</sup> Comments of Shaw Communications Inc., SMSE-002-17, 29 March 2017, para. 12; Comments of Microsoft Corporation, SMSE-002-17, undated, p. 3; Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017, p. 6; and Comments of Wi-Fi Alliance, SMSE-002-17, 29 March 2017, para. 2.1.

<sup>7</sup> Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017, p. 6.

<sup>8</sup> Comments of Shaw Communications Inc., *supra*, para. 31; Comments of Microsoft Corporation, SMSE-002-17, undated, p. 3; and Comments of Wi-Fi Alliance, SMSE-002-17, 29 March 2017, para. 2.1.

<sup>9</sup> Comments of Shaw Communications Inc., *supra*, 17, para. 31.

<sup>10</sup> Comments of Cisco Systems Inc., *supra*, p. 17.

<sup>11</sup> Raul Katz, *Assessment of the Economic Value of Unlicensed Spectrum in the United States*, February 2014, p.29, in Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017 (Katz).

- It has been estimated that countries will need to add between 500MHz and 1GHz of new spectrum for RLANs by 2025 in order to keep pace with growing demand for these networks.<sup>12</sup>

***The tremendous growth in demand for Wi-Fi spectrum is driven by bandwidth intensive devices and applications***

- *Gigabit Internet:* Gigabit speed fixed broadband service is widely available to millions of homes in Canada today.<sup>13</sup> These services are having a significant impact on data consumption and driving demand for Wi-Fi spectrum.<sup>14</sup>
- *Video Traffic:* From 2015 to 2020, global IP video traffic is projected to grow threefold and global Internet video traffic is projected to grow fourfold.<sup>15</sup> By 2020, over 80 percent of all IP traffic will be video. In Canada, Internet video traffic will grow three-fold from 2015 to 2020, representing a compound annual growth rate of 27 percent, and consumer Internet video traffic will be 83 percent of consumer Internet traffic in 2020, up from 71 percent in 2015.<sup>16</sup>
- *Ultra-High Definition TV:* It is estimated that by 2020, more than 40 percent of connected flat-panel televisions globally will be ultra-high definition or 4K TVs. 4K video traffic (18 Mbps bit rate) is projected to account for 21 percent of global video-on-demand traffic by 2020.<sup>17</sup>
- *Internet of Things:* From 2016 to 2021, the number of smart devices in Canada is estimated to grow 1.7 fold (54 million devices in 2021) and smart mobile data traffic is estimated to grow 4.7 fold. Machine-to-machine (“M2M”) traffic is projected to grow 17-fold during this period of time.<sup>18</sup>

***AMaximizing access to Wi-Fi generates economic and social benefits***

- Technologies operating in unlicensed spectrum bands in Canada generated an estimated total economic value of \$20 to \$25 billion in 2013.<sup>19</sup> Wi-Fi access generates value by:<sup>20</sup>
  - Complementing wireline and cellular technologies (efficiencies);
  - Providing an environment that contributes to the development of alternative technologies;
  - Fostering the development of new and innovative businesses models; and
  - Expanding access to communications services.

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<sup>12</sup> Comments of Wi-Fi Alliance, SMSE-002-17, 29 March 2017, para. 2.3 and Comments of Cisco Systems Inc., *supra*, p. 12.

<sup>13</sup> Comments of Rogers Communications Inc., SMSE-002-17, 24 March 2017, para. 4.

<sup>14</sup> Comments of Cogeco Communications Inc., SMSE-002-17, 24 March 2017, p.3; and Rogers Communications Canada Inc., SMSE-002-17, 29 March, 2017, para. 5.

<sup>15</sup> Comments of Cogeco Communications Inc., *supra*, para. 8.

<sup>16</sup> Cisco, “Canada - Device Growth Traffic Profiles,” *VNI Mobile Forecast Highlights, 2016-2021*, cited in Comments of PIAC, SMSE-002-17, 29 March 2017. See also Comments of Cisco, SMSE-002-17, 29 March 2017, p. 9.

<sup>17</sup> Comments of Cogeco Communications Inc., *supra*, para 10.

<sup>18</sup> Cisco, “Canada - Device Growth Traffic Profiles,” *VNI Mobile Forecast Highlights, 2016-2021*, cited in Comments of PIAC, *supra*.

<sup>19</sup> Comments of Cisco Systems Inc., *supra*, p. 8.

<sup>20</sup> Katz, cited in Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017, p. 7.

- Technologies operating in unlicensed spectrum bands in the United States generated a total economic value of \$222 billion in 2013 and contributed \$6.7 billion to the country's GDP.<sup>21</sup>
- The estimated value of Wi-Fi access in Europe was approximately €15 billion in 2013 and is expected to grow to €23 billion by 2023.<sup>22</sup>
- It is estimated that the total economic gain to all households worldwide from Wi-Fi access is around \$52 to \$99 billion each year.<sup>23</sup> Wi-Fi substantially enhances the value of fixed broadband by extending broadband connections, increasing take-up and allowing connections to be effectively shared between multiple individuals.
- It is estimated that the expansion of unlicensed spectrum (access to contiguous spectrum at 5 GHz) will result in a Net Present Value benefit of €12.3 billion in Europe from the improved quality of Wi-Fi service, including higher speeds.<sup>24</sup>
- Wi-Fi offloading leads to billions in dollars in cost savings for mobile operators by reducing the number of base stations that need to be built to meet the tremendous growth in demand for cellular data.<sup>25</sup> In the absence of Wi-Fi offloading, it is estimated that Canada would require 27,000 cell sites, which is more than double the 13,000 cell sites in operation today.<sup>26</sup>

### III. Responses to Arguments Raised in Opposition to Immediate Rule Changes

14. This section addresses some of the specific arguments that were raised by parties that were generally opposed to the harmonization of Canada's rules for higher power RLAN devices with those in the United States prior to WRC-19. Any failure on the part of Shaw to address a specific argument or issue raised by these parties should not be construed as agreement with or acceptance of such issue or argument where to do so would be contrary to Shaw's interests.

#### ***Adopting Rule Changes in Advance of WRC-19***

15. One of the arguments that was raised by parties that are opposed to making changes to the rules for higher power RLANs in advance of WRC-19 is that taking this action would "*pre-judge the*

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<sup>21</sup> *Ibid*, p. 18.

<sup>22</sup> *The Future Use of License-Exempt Spectrum UK*, Plum Consulting (2016) (Plum Consulting), cited in Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017, p. 8

<sup>23</sup> *The Economic Significance of Unlicensed to the Future of the Internet*, Richard Thanki (2012) (Thanki), cited in Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017, p. 8

<sup>24</sup> Plum Consulting, *supra*, p. 8.

<sup>25</sup> *Study on the impact of traffic offloading and related technological trends on the demand for wireless broadband spectrum*, European Commission DG Communications Networks, Content & Technology (2013), cited in Comments of Cisco Systems Inc., SMSE-002-17, 29 March 2017, p. 9.

<sup>26</sup> Thanki, cited in Comments of Cisco Systems Inc., *supra*, p. 8.

*results of studies*" within the Canadian Preparatory Committee (CPC) on ITU Agenda Item 1.16<sup>27</sup> as well as Canada's position on this Agenda Item prior the WRC.<sup>28</sup> NAV Canada further argues that adopting rule changes now runs the risk that future international rules could conflict with any national rules that are adopted now.

16. Before responding to these specific arguments, it is important to point out that no one in this proceeding has suggested that Canada should adopt rules that are inconsistent with its international obligations. If the Department decides to authorize higher power RLANs prior to WRC-19, it would be on the condition that the operation of these devices is on a no protection, non-interference basis, meaning that priority users in the band must be protected. This is the approach that the Department has adopted with respect to other devices that make use of unlicensed spectrum such as those authorized pursuant to RSS-210 and RSS-247, and no change to this approach has been proposed by Shaw or any other party to this proceeding.
17. It is also important to note that this approach is consistent with Canada's obligations under Section 4.4 of the ITU *Radio Regulations*<sup>29</sup> as well as Articles 6.1 and 6.2 of the *Constitution of the International Telecommunication Union* which make it clear that administrations are not constrained from adopting domestic rules that differ from those established at the level of the ITU, provided that those rules do not result in harmful interference to the radio services and radio stations of other countries.
18. Even ITU-R Resolution 229, which is cited by other parties in this proceeding that are opposed to making changes to Canada's RLAN, includes a provision which states that administrations may exercise flexibility in adopting interference mitigation techniques that apply domestically.
19. Accordingly, any suggestion that the authorization of higher power RLANs in Canada in advance of WRC-19 constitutes a violation of the ITU's rules is false. The exact opposite is the case - if Canada were to adopt the rule changes that have been advocated by the vast majority of parties in this proceeding, this would be entirely consistent with its international obligations.

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<sup>27</sup> Comments of Parscom Management, SMSE-002-17, p. 2.

<sup>28</sup> Comments of the Canadian Space Agency, SMSE-002-17, 29 March 2017, p. 4; see also Comments of Parscom Management, *supra*, p. 2, Comments of Transport Canada, SMSE-002-17, 14 March 2017, p. 1, and Comments of NAV Canada, SMSE-002-17, 28 March 2017, p. 1.

<sup>29</sup> This section of the *Radio Regulations* provides as follows: "*Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, **except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.***" [Emphasis added]

20. With respect to the argument that the authorization of higher power RLANs in Canada in advance of WRC-19 would “pre-judge” the results of the studies within the CPC in relation to ITU Agenda Item 1.16, Shaw is not aware of any studies that are being carried out by the CPC on this Agenda Item. If the intention of this argument was to suggest that the authorization of higher power RLANs in Canada in advance of WRC-19 would “prejudge” Canada’s position on these devices prior to the WRC, Shaw notes that the Department regularly authorizes the operation of radio apparatus in Canada on a no protection, non-interference basis and this has never fettered the positions that it has adopted at the ITU, nor has it undermined the Department’s ability to manage the activities of various CPCs in a neutral manner in advance of WRC conferences.
21. Even if this were the case, taking a “wait and see” approach is not a realistic alternative, nor is it in the public interest. As noted above, Canada cannot wait until the outcome of WRC-19 to determine whether the 5150-5250 MHz rules should be harmonized with those of the United States. The demand for Wi-Fi spectrum from consumers and businesses here in Canada, coupled with our proximity to, and the realities of sharing an equipment ecosystem with, the United States where higher power RLANs are widely available, make this untenable.
22. With respect to NAV Canada’s argument that adopting rule changes for higher power RLANs in Canada now would run the risk that they would conflict with future international rules, it is important to remember that the reason why Agenda Item 1.16 exists is because of the need for additional spectrum for RLANs. This is evident from the language of ITU Resolution 239 (WRC-15) which provides, in relevant part, as follows:
- ...considering*
- a) *that there has been considerable growth in the demand for Wireless Access Systems including radio local area networks (WAS/RLAN) applications with multimedia capabilities;*
- b) *that WAS/RLAN applications contribute to global economic and social development by providing a wide range of multimedia applications;*
- c) *that there is a need to continually take advantage of technological developments in order to increase the efficient use of spectrum and facilitate spectrum access;*
- d) *that as technology evolves to meet increasing performance demands and traffic on broadband WAS increases, the use of wider bandwidth channels in order to support high data rates creates a need for additional spectrum...*
23. Therefore, while there is no guarantee that RLAN rule changes will flow from WRC-19, it is clear that the international community is well aware of the need for additional RLAN spectrum and that

one of the most logical, prudent and spectrally efficient radio frequency bands for addressing this need is the 5150-5250 MHz band. The direction in which WRC-19 is headed is clear.

24. There is no benefit to waiting until after WRC-19 to amend the rules for higher power indoor and outdoor RLANs in Canada. If we wait any longer to authorize these devices here in Canada, this will only exacerbate the problems that we are currently experiencing with spectrum saturation and exhaust in the Wi-Fi bands, surging user demand, and the lack of harmonization in the North American equipment ecosystem for higher power RLAN devices. As noted by Ericsson:

*Considering the rapidly changing market, consumer behaviour and demands, and changing technologies, any further delay in harmonizing with the FCC will disadvantage Canadian consumers and companies compared to those in the US - which already benefit from a three-year head-start... In addition, with the world's longest land border and the tight trade environment between Canada and the US, it is far better to have a proactive approach to dealing with emerging technologies and products from the US rather than to have an ad-hoc and reactive approach when facing new, innovative technologies and products.<sup>30</sup>*

#### **The Demand for Additional RLAN Spectrum**

25. Another one of the arguments raised by parties that are opposed to changing the rules for higher power RLANs in advance of WRC-19 is that the demand for additional RLAN spectrum has been over-stated. For example, Globalstar and Parscom argue that there is no concrete evidence of demand for additional Wi-Fi spectrum in Canada and that “superimposing projections from other parts of the world” leads to over-inflated results.<sup>31</sup> The CSA further argues that the Canadian market is very different from the United States, characterized by a much smaller population and a vast geography.<sup>32</sup>
26. These arguments ignore the significant amount of data and evidence that has been published on Wi-Fi spectrum demand which not only shows that demand for this spectrum in Canada is skyrocketing but that the pace and size of this demand in Canada outstrips international averages. For example, in Canada, Wi-Fi represented 57.6% of total Internet traffic in 2015 and will rise to 64.9% of total Internet traffic in 2020, which is higher than the corresponding global numbers which saw Wi-Fi traffic account for 55.2% of total Internet traffic in 2015, and will rise to 59.1% of total Internet traffic by 2020.<sup>33</sup>

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<sup>30</sup> Comments of Ericsson, SMSE-002-17, 28 March 2017, p. 8.

<sup>31</sup> Comments of Parscom Management, SMSE-002-17, 29 March 2017, p. 2; see also Comments of Globalstar, *supra*, p. 1.

<sup>32</sup> Comments of Canada Space Agency, SMSE-002-17, 29 March 2017, page 4.

<sup>33</sup> Cisco, [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#)

27. Although this data can be easily found in the public domain, none of the opponents explain why this readily available data overstates the demand for additional Wi-Fi spectrum, nor have they provided studies of their own which demonstrate that the demand levels in Canada are lower.
28. In fact, these parties overlook the ITU's own conclusions in Resolution-239 (WRC-15) that "*there has been considerable growth in the demand for Wireless Access Systems including radio local area networks (WAS/RLAN) applications with multimedia capabilities.*"
29. With respect to the argument raised by the CSA regarding Canada's population and geographic size, these arguments do not make technical sense. The fact that Canada has a smaller population than the United States or that it has a larger land mass are irrelevant to the issue of access to spectrum. As noted by Bell, spectrum congestion is a localized phenomenon, which means that a location, such as downtown Toronto, can be just as spectrally congested as New York City.
30. Even small providers that offer broadband and Internet access services in Canada's more rural and remote communities have observed that the 900 MHz and 2.4 GHz frequency bands are "virtually unusable in most areas" as a result of the "explosion of consumer devices using these bands for various applications."<sup>34</sup>
31. As Bell noted, there is an inherent contradiction in the demand-related arguments that have been made by parties that are opposed to rule changes for higher power RLANs. If, as these parties argue, there is no significant demand for higher power RLAN devices, there would be no significant contribution (if any) to the noise floor and, therefore, no concerns regarding harmful interference from these devices.

### ***Addressing Interference Concerns***

32. In its Consultation Document, the Department identified two potential interference-related concerns associated with the operation of higher power RLAN devices, namely the potential for these devices to cause interference to the uplink operations of the Globalstar satellite network and the potential for these devices to cause interference to the downlink operations of a single earth station facility operated in Ottawa by the CSA and the Department of National Defence.
33. With respect to the first of these concerns, Globalstar argues that it requires "internationally harmonized regulations that set power levels and antenna mask restrictions followed by all countries around the world" and that "it does not believe that the US regulations can be applied

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<sup>34</sup> Comments of CanWISP, SMSE-002-17, 29 March 2017, p. 3.

on a worldwide basis and guarantee protection of the Globalstar satellite network”.<sup>35</sup> In light of these concerns, Globalstar argues that “the best place to address this issue will be at WRC-19 under Agenda Item 1.16” because the decisions that flow out of WRC-19 “will result in new ITU Regulations which all countries around the world will follow when they ratify the Final Acts of WRC-19.”<sup>36</sup>

34. Shaw has reviewed the 1 ½ page submission that was filed by Globalstar in this proceeding and notes the complete absence of any evidence or data which supports these claims, including the unsubstantiated assertion that the rules developed by the FCC cannot be applied globally. Leaving aside the fact that this lack of evidence leaves interested parties with no better understanding of Globalstar’s interference-related concerns, it invites the question as to why Globalstar agreed to the FCC’s rules for higher power RLANs in the first place. Given that the United States is the filing administration for the Globalstar satellite network for ITU purposes, Globalstar’s comments are especially puzzling. It is hard to believe that the FCC would revise its rules for higher power RLAN devices if it believed that these rules would cause interference to Globalstar, which is a United States system, either nationally or internationally.
35. In its comments in this proceeding, Cisco describes the history of the debate in the United States relating to higher power RLANs, including why the issue initially arose (i.e., as a result of increasing demand for Wi-Fi spectrum coupled with technological changes and a maturing ecosystem of Wi-Fi service providers and applications) and how it was ultimately resolved by the FCC. As Cisco points out in its comments, Globalstar was involved at every stage of the FCC’s proceeding and, ultimately, agreed that the industry-led approach in which it was directly involved would protect satellites.<sup>37</sup>

*What is significant about this history is that the Wi-Fi industry and the satellite incumbent were largely able to agree on the conditions under which Wi-Fi could make improved use of the band. It is noteworthy that the decision was not appealed by any party... In the case of the US rules, the elevation mask rule was the product of a negotiation involving both cable operators and Globalstar. The rule addresses Globalstar’s concern that aggregate radio energy from HPODs would adversely impact its satellite operations. By keeping the HPOD radio energy near a horizontal plane, the aggregate HPOD energy that the satellite processors will receive is considerably lessened, enabling both uses to share the same spectrum effectively.<sup>38</sup>*

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<sup>35</sup> Comments of Globalstar, *supra*, page 1.

<sup>36</sup> *Ibid.*

<sup>37</sup> Comments of Cisco, *supra*, page 20.

<sup>38</sup> Comments of Cisco, *supra*, page 13.

36. Once again, Shaw notes that no party to this proceeding, including Globalstar itself, has provided any concrete evidence that the adoption of the FCC rules in Canada would result in harmful interference to Globalstar's operations.
37. While Shaw acknowledges that some parties pointed to static noise-level thresholds as a potential concern,<sup>39</sup> Shaw submits that this is an insufficient basis for determining harmful interference. Indeed, the existence of noise alone does not constitute harmful interference – the noise level must be shown to be detrimental to the operation of the system. The only study that has carried out this analysis is that of CableLabs, which concluded that there would be no system impact from greater use of the band.<sup>40</sup>
38. In any event, as many parties to this proceeding have observed, any risks of harmful interference can be mitigated with protective measures similar to those adopted by the FCC in the United States where there have been no interference issues since the reforms have been implemented. These measures include the establishment of an elevation mask for outdoor deployments and the requirement that devices be operated on a “no interference no protection basis”. We agree with Bell that the U.S. experience clearly demonstrates that under specific conditions – such as using an antenna mask – sharing between RLAN and other services is indeed possible and would be possible in Canada as well.
39. The second interference related concern identified by the Department in its Consultation Document relates to a receiving earth station in the 5150-5250 MHz band operated in Ottawa by the CSA and DND. In order to address this concern, the Department proposed the adoption of a 25 km exclusion zone surrounding these facilities.
40. Shaw notes that the CSA did not submit any comments on the Department's exclusion zone proposal. It is not clear what conclusions, if any, should be drawn from this fact.
41. With respect to the comments of other parties, most agreed that these receive facilities need to be protected. Moreover, they also noted that the creation of a 25 km exclusion zone in one of Canada's most populated urban areas would deprive hundreds of thousands of Canadians of the benefits of higher power RLANs. As noted by the Public Interest Advocacy Centre:

*The proposed 25 km exclusion zone surrounding the Canadian Space Agency and the Department of National Defence in Ottawa, Ontario... creates a significant HPOD-prohibited zone in a fairly densely-populated region. With a population of about 1.35 million residents, Ottawa-Gatineau is still one of the largest urban centres – and the capital city – of Canada. Establishing an*

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<sup>39</sup> Comments of RABC, SMSE-002-17, 29 March 2017, para 35.

<sup>40</sup> Technical Report of CableLabs, SMSE-002-17, 29 March 2017.

*exclusion zone would result in the exclusion of a significant number of HPOD users in the outdoor Ottawa area.*

42. Other parties, including Intel, Ericsson, Microsoft, Nokia and the Wi-Fi Alliance, noted that it would be helpful if the Department could make public the study that it relied upon in developing its proposal for a 25 km exclusion zone, and stated that the absence of this study makes it difficult to comment on the proposal. In many instances, these parties proposed alternatives to the Department's 25 km exclusion zone, including the establishment of a "special registration zone"<sup>41</sup> surrounding this earth station facility and/or the adoption of other interference mitigation techniques that take into account the terrain/topography of the area, antenna angles as well as methods to make the earth station itself more resilient.
43. A final set of interference-related issues were raised by the CSA and EEEC regarding out of band emissions (OOBE) into the 5250-5350 MHz band resulting from the operation of higher power RLANs in the 5150-5250 MHz band. For example, the CSA argued that allowing the use of higher power RLANs on an outdoor basis "*with no regulatory control over deployment levels, will increase the out of band emissions into the band 5250-5350 MHz used on next generation Synthetic Aperture Radar (SAR) missions*" which "*could cause a significant increase in the noise seen by an EESS receiver.*"<sup>42</sup> The CSA further stated that paragraph 21 of the Consultation Document makes reference to the use of a 160 MHz channel bandwidth which "implies the use of at least part of 5250-5350 MHz."<sup>43</sup>
44. In response, Shaw notes that, even though the focus of this proceeding is on the 5150-5250 MHz frequency band, the 5250-5350 MHz band is also allocated for RLAN use. Shaw further notes that when the FCC revised its rules for higher power RLANs in the 5150-5250 frequency band in 2014, the limits for OOBE were maintained for both this band as well as the 5250-5350 MHz band. Therefore, any OOBEs from higher power RLANs operating in 5150-5250 MHz into the 5250-5350 MHz band would have to be much lower than the intentional emissions of RLANs deployed in the 5250-5350 MHz frequency band.
45. Canada's OOBE limits for RLANs operating in the 5150-5350 MHz frequency band are harmonized with those of the FCC<sup>44</sup> and there is no suggestion or proposal in this proceeding to change those limits. Thus, the existing provisions in RSS-247 that deal with OOBE limits for RLANs operating in the 5150-5250 MHz band would also apply to higher power RLANs operating in this band which will ensure that any OOBEs from devices in this band will be much lower than

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<sup>41</sup> Shaw suggested a similar alternative in our Comments at para 66.

<sup>42</sup> Comments of the Canadian Space Agency, SMSE-002-17, 29 March 2017, p. 5.

<sup>43</sup> *Ibid*, p. 5.

<sup>44</sup> See Section 6.2 of RSS-247.

the intentional emissions of RLANs operating in the 5250-5350 MHz band. These limits provide, in relevant part, as follows:

#### **6.2.1.2 Unwanted emission limits**

*For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.<sup>45</sup>*

46. In light of the foregoing, Shaw submits that there is no basis to the arguments made by the CSA that the operation of higher power RLANs would result in increased OOBes or other incursions into the adjacent 5250-5350 MHz frequency band.

#### **IV. Authorization Procedures**

47. In its Consultation Document, the Department invited interested parties to comment on two different approaches to the authorization of higher power RLANs in the event that it decides to authorize the operation of these devices in Canada prior to WRC-19. The first approach would entail the creation of a “licence exempt” or LE regime for higher power RLAN devices which, among other things, would involve the development of specific equipment standards and technical requirements that would apply to higher power RLANs operating in the 5150-5250 MHz frequency band. The second approach would be to require users to obtain a licence to operate higher power RLAN devices, and be subject to specific licence conditions.
48. Most parties that support the authorization of higher power RLANs in Canada prior to WRC-19 argued in their comments that the Department should adopt an LE approach to these devices that is aligned as much as possible with the approach taken by the FCC in the United States. As noted by Cogeco:

*This approach ensures that the certification of HPODs in Canada is managed in an administratively efficient fashion, while at the same time safeguarding the operations of incumbent users in the band through enhanced interference*

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<sup>45</sup> RSS-247, Section 6.2.1.2

*mitigation measures, including elevation mask requirements, and the registration of large scale HPOD deployments with the Department.*<sup>46</sup>

49. There was also support for the Department's proposed light-licensing approach, which was positioned in the Consultation Document as a more expedient solution that would avoid delays in implementing an LE approach due to the Department's view that the LE approach would "involve amendments to the *Radiocommunication Regulations*".<sup>47</sup>
50. In Shaw's view, an LE approach would be ideal, but it is more important for the sake of the public interest to move forward expeditiously. Shaw therefore supports a "light licensing" approach featuring the following elements:
- a. A "blanket" or "light" license would be issued to parties who wish to operate multiple higher power devices that have similar or identical technical characteristics;
  - b. Licensees would be required to adhere to a standard set of technical rules that align with the rules established by the FCC in the United States, including a limit on outdoor emissions to 125 mW above a 30° elevation angle; and
  - c. The requirement to operate higher power devices on a "no interference no protection" basis.

## **V. Conclusion**

51. Shaw requests that the Department proceed expeditiously with reform to the 5150-5250 MHz band in order to harmonize its rules with the United States and allow Canadian consumers and businesses to reap the benefits of these reforms while protecting incumbent users. In particular, Shaw would support a light-licensing approach.
52. In Shaw's view, our Government's innovation and economic growth agenda depends on the availability of competitive, dynamic connectivity services that are responsive to the needs of Canadian consumers and businesses. Reforming the rules for the 5150-5250 MHz band would be an important step forward to achieving this goal by maximizing the public interest in realizing the full economic and social benefits of scarce spectrum resources.
53. Reforming the rules in the 5150-5250 MHz band is of critical importance for Canadian consumers and businesses and to Canada's digital future. Such reform would balance the need to protect incumbent users while responding to the indisputable evidence that these changes would go a long way to helping meet the growing demand for this spectrum in Canada. This would ensure

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<sup>46</sup> Comments of Cogeco, SMSE-002-17, 28 March 2017, para 24.

<sup>47</sup> Consultation Document, para. 26.

that Canadians have access to the same connectivity experiences as are available in the U.S., conforming Canadian and American equipment ecosystems and enabling the endless possibilities associated with unlicensed spectrum in today's dynamic environment.