

November 10, 2017

VIA EMAIL (ic.spectrumauctions-encheresduspectre.ic@canada.ca)

Senior Director
Spectrum Licensing and Policy Branch—ISED
235 Queen Street (6th Floor East Tower)
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Dear Senior Director

RE: Reply to Comments, *Consultation on Releasing Millimetre Wave Spectrum to Support 5G*, SLPB-001-17, June 2017

Facebook, Inc. is pleased to submit these reply comments in response to Innovation, Science, and Economic Development Canada's ("ISED") Consultation on Releasing Millimetre Wave Spectrum to Support 5G. As noted in its initial comments, Facebook supports ISED's efforts to foster innovation and investment in wireless technologies and connectivity through making additional millimetre wave band spectrum available.¹ In particular, in response to Question 8-1, Facebook strongly supports making the 64-71 GHz band available for license-exempt use to extend currently harmonized license-exempt services in the 57-64 GHz band. And in response to Questions 6-1 and 7-1, Facebook supports ISED's proposal to implement flexible use licensing in the 28 GHz and 37-40 GHz bands. In the initial comment round, the record showed broad support for these positions.

1. The Record Showed Strong Support for Making the 64-71 GHz Band License-Exempt (Question 8-1)

A broad range of industry commenters support ISED's proposal to make the 64-71 GHz band license-exempt.² These commenters recognize the importance of harmonizing spectrum

¹ Comments of Facebook, Inc. (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Facebook.PDF/\\$file/SLPB-001-17-comments-received-Facebook.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Facebook.PDF/$file/SLPB-001-17-comments-received-Facebook.PDF).

² See Comments of Wifi Alliance at 7-8 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-WiFi-Alliance.PDF/\\$FILE/SLPB-001-17-comments-received-WiFi-Alliance.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-WiFi-Alliance.PDF/$FILE/SLPB-001-17-comments-received-WiFi-Alliance.PDF); Comments of Shaw Communications Inc. ¶ 79 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Shaw.PDF/\\$file/SLPB-001-17-comments-received-Shaw.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Shaw.PDF/$file/SLPB-001-17-comments-received-Shaw.PDF); Comments of TELUS Communications Co. at 32 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-TELUS.PDF/\\$FILE/SLPB-001-17-comments-received-TELUS.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-TELUS.PDF/$FILE/SLPB-001-17-comments-received-TELUS.PDF); Comments of Radio Advisory Board of Canada ¶ 14 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-RABC.PDF/\\$file/SLPB-001-17-comments-received-RABC.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-RABC.PDF/$file/SLPB-001-17-comments-received-RABC.PDF); Comments of Intel Corporation at 10 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Intel.PDF/\\$FILE/SLPB-001-17-comments-received-Intel.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Intel.PDF/$FILE/SLPB-001-17-comments-received-Intel.PDF); Comments of Bell Mobility Inc. ¶ 79 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Bell-Mobility.PDF/\\$FILE/SLPB-001-17-comments-received-Bell-Mobility.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Bell-Mobility.PDF/$FILE/SLPB-001-17-comments-received-Bell-Mobility.PDF); Comments of British Columbia Broadband Association ¶¶ 50-51

use in this band with the United States because doing so “will allow Canada to benefit from economies of scale”³ in consumer devices as “industry stakeholders have assembled a strong ecosystem for developing products, services, and standards for IEEE 802.11ad.”⁴ The British Columbia Broadband Association also noted that the propagation characteristics of the 64-71 GHz band mean “the potential for interference is low”⁵ in a license-exempt framework. And yet, compared to the 57-64 GHz band, commenters claim that the 64-71 GHz band provides for better outdoor range because oxygen attenuation is less severe.⁶ This could lead to “more than four times greater range for line-of-sight applications, which will lead to new lower cost, license-exempt outdoor applications.”⁷

Facebook opposes licensing the 64-71 GHz band as certain commenters suggested.⁸ The substantial existing ecosystem of investment and innovation in license-exempt technologies in the band shows that the majority of industry’s regulatory expectations are behind a license-exempt framework. And, although Facebook recognizes that both licensed and unlicensed spectrum will be needed for 5G services, a gigahertz to gigahertz comparison of the spectrum proposed to be licensed versus unlicensed in this proceeding fails to account for the differences between the 64-71 GHz band and the other millimetre wave bands at issue (28 GHz, 37-40 GHz). These bands differ greatly across a variety of factors, including existing services, propagation characteristics, and device ecosystems, and these differences make distinct regulatory licensing schemes appropriate.

Finally, as noted in its initial comments, Facebook applauds ISED’s efforts not just to make the 64-71 GHz license-exempt, but its application of the clear and concise language in Annex J.2.2, which will best serve the new and innovative technologies that are being developed

(15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-BCBA.PDF/\\$FILE/SLPB-001-17-comments-received-BCBA.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-BCBA.PDF/$FILE/SLPB-001-17-comments-received-BCBA.PDF); Comments of IEEE 802 (4 Aug. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-IEEE-LMANSC.PDF/\\$file/SLPB-001-17-comments-received-IEEE-LMANSC.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-IEEE-LMANSC.PDF/$file/SLPB-001-17-comments-received-IEEE-LMANSC.PDF); Comments of Dynamic Spectrum Alliance at 4 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF/\\$file/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF/$file/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF); Comments of Cogeco Communications Inc. ¶ 41 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF/\\$file/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF/$file/SLPB-001-17-comments-received-Dynamic-Spectrum-Alliance.PDF); Comments of Microsoft at 4-5 (14 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Microsoft.PDF/\\$FILE/SLPB-001-17-comments-received-Microsoft.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Microsoft.PDF/$FILE/SLPB-001-17-comments-received-Microsoft.PDF).

³ Comments of Cogeco ¶ 41.

⁴ Comments of Intel Corporation at 10; *see also* Comments of Bell Mobility ¶ 79 (agreeing that it is important to harmonize spectrum with the U.S. particularly where consumer devices are concerned); Comments of Shaw Communications at ¶79 (noting the “tremendous consumer and service provider interest in short range wireless connections”).

⁵ Comments of the British Columbia Broadband Association ¶¶ 50-51.

⁶ Comments of Wi-Fi Alliance at 8; *see also* Comments of Dynamic Spectrum Alliance at 4.

⁷ Comments of Dynamic Spectrum Alliance at 4.

⁸ Comments of Ericsson Canada Inc. at 13 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Ericsson.PDF/\\$file/SLPB-001-17-comments-received-Ericsson.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Ericsson.PDF/$file/SLPB-001-17-comments-received-Ericsson.PDF) (noting that licensing the band would provide greater regulatory certainty and a predictable level of service); Comments of Nokia at 7 (15 Sep. 2017) (noting that the amount of spectrum to be designated as unlicensed was greater than that to be designated as licensed) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Nokia.PDF/\\$FILE/SLPB-001-17-comments-received-Nokia.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Nokia.PDF/$FILE/SLPB-001-17-comments-received-Nokia.PDF).

in the band.

2. The Record Showed Strong Support for Making Millimetre Wave Band Spectrum Available for Flexible Use (Questions 6-1 and 7-1)

The record showed strong support for making millimetre wave band spectrum available for flexible use, particularly in the 28 GHz and the 37-40 GHz bands.⁹ Facebook believes that as these bands are built out, more users will enjoy high-speed connectivity and broadband providers will have more traffic to backhaul. 5G will create demand for higher broadband speeds and IoT applications in underserved markets. High-altitude solar planes, like the one Facebook is developing, can help broadband providers extend their markets with lower cost backhaul. Facebook recognizes that the International Telecommunication Union (ITU) has identified for study bands for high-altitude platform services (HAPS) that overlap with the same bands being considered globally for IMT 2020 and domestically by ISED, including the 28 GHz and 37-40 GHz band.¹⁰ However, Facebook believes that the economies of scale created by harmonization in these bands are necessary for broadband providers to affordably integrate HAPS into their networks to extend their service coverage to underserved areas.

Commenters agree that harmonization around flexible broadband use in these millimetre wave spectrum bands will support economies of scale and drive 5G innovation and deployment.¹¹ As noted by Bell Mobility, a flexible use framework is “a wise approach given the uncertainty surrounding what the deployment of 5G will ultimately look like.”¹² Commenters also noted that flexible use will be critical to allow operators to determine different solutions to meet the needs of different areas, including rural areas, and the needs of newly developing technologies.¹³

⁹ Comments of 5G Americas at 4-6 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-5G-Americas.PDF/\\$FILE/SLPB-001-17-comments-received-5G-Americas.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-5G-Americas.PDF/$FILE/SLPB-001-17-comments-received-5G-Americas.PDF); Comments of Xplornet Communications Inc. at 3 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Xplornet.PDF/\\$FILE/SLPB-001-17-comments-received-Xplornet.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Xplornet.PDF/$FILE/SLPB-001-17-comments-received-Xplornet.PDF); Comments of Bell Mobility ¶ 23 & ¶ 47; Comments of British Columbia Broadband Association ¶ 22, ¶ 32; Comments of Ericsson at 12; Comments of Huawei Technologies Canada at 4, 9 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Huawei.PDF/\\$file/SLPB-001-17-comments-received-Huawei.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Huawei.PDF/$file/SLPB-001-17-comments-received-Huawei.PDF); Comments of Samsung Electronics Canada at 7, 13 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Samsung.PDF/\\$file/SLPB-001-17-comments-received-Samsung.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Samsung.PDF/$file/SLPB-001-17-comments-received-Samsung.PDF); Comments of Nokia at 3-6; Comments of Rogers Communications at 7 (15 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Rogers.PDF/\\$file/SLPB-001-17-comments-received-Rogers.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-Rogers.PDF/$file/SLPB-001-17-comments-received-Rogers.PDF); Comments of SaskTel ¶8, ¶ 58 (15 Sep. 2017) at [https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-SaskTel.pdf/\\$file/SLPB-001-17-comments-received-SaskTel.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-SaskTel.pdf/$file/SLPB-001-17-comments-received-SaskTel.pdf); Comments of Shaw Communications ¶ 41; Comments of TELUS at 10, 24; Comments of TeraGO Networks at 4-6 (14 Sep. 2017) at [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-TeraGo-Networks.PDF/\\$FILE/SLPB-001-17-comments-received-TeraGo-Networks.PDF](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/SLPB-001-17-comments-received-TeraGo-Networks.PDF/$FILE/SLPB-001-17-comments-received-TeraGo-Networks.PDF).

¹⁰ Resolution 160 (WRC-15) resolves that the ITU-R will study the existing HAPS identification of 27.9-28.2 GHz (paired with 31.0-31.3 GHz), and as appropriate 38-39.5 GHz available at https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000C0015PDFE.pdf.

¹¹ See Comments of 5G Americas at 4-6; Comments of Ericsson at 12; Comments of Samsung at 7; Comments of Shaw Communications ¶ 41.

¹² Comments of Bell Mobility ¶ 47.

¹³ See Comments of the British Columbia Broadband Association ¶ 32 (noting that the 37-40 GHz band has

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the potential to deliver high speed connectivity to rural communities through flexible use); Comments of Rogers Communications at 7 (arguing that flexible use should include integrated backhaul); Comments of Bell Mobility ¶ 21 (stating that licensees should be allowed to determine whether to deploy fixed or mobile or a combination of fixed and mobile solutions); Comments of TeraGo Networks Inc. at 5-6 (noting that fixed wireless technology in the 38 GHz band is still developing and flexible use is critical).