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DSA
DYNAMIC • SPECTRUM • ALLIANCE

September 15, 2017

Innovation, Science, and Economic Development Canada
c/o Senior Director, Spectrum Licensing and Auction Operations
235 Queen Street, 6th Floor
Ottawa, Ontario K1A 0H5

Re: 'Consultation on Releasing Millimetre Wave Spectrum to Support 5G' (SLPB-001-17)
Canada Gazette, Part 1, June 2017

Dear Sir or Madam:

The Dynamic Spectrum Alliance (DSA) applauds the Innovation, Science, and Economic Development (ISED) Canada's efforts to enable greater utilization of spectrum resources in support of the deployment of 5th generation (5G) wireless networks and systems in frequencies above 24 GHz (collectively the millimeter wave bands) through the above referenced Consultation.

The DSA is a global organization advocating for laws and regulations that will lead to more efficient and effective spectrum utilization. Our membership spans multinationals; small- and medium sized enterprises; and academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the amount of available spectrum to the benefit of consumers and businesses alike. Our primary goals are to close the digital divide by reducing the cost of deploying last-mile wireless networks, enabling the Internet of Things, and alleviating the spectrum crunch.[1]

The DSA agrees with ISED's approach of harmonizing spectrum use with other countries to the greatest extent possible, particularly for applications which involve consumer devices. In general, greater harmonization fosters innovation, investment, and faster deployment of a given generation of information and communications technologies.

ISED should adopt a "flexible use" licensing model for the 37-40 GHz bands, along the lines of what the U.S. Federal Communications Commission (FCC) established for its 37 GHz, and 39

[1] For more on the DSA, please visit www.dynamicspectrumalliance.org

GHz frequency bands, but tailoring it for the Canadian context. We commend ISED for inviting proposals that could facilitate more efficient sharing between terrestrial 'flexible use' stations and FSS earth stations across the 37-40 GHz bands.

Specifically, with respect to the 37-40 GHz frequency band ISED should: (1) authorize license-by-rule operations across the entire band on a secondary basis, (2) establish a use-or-share requirement for licensed operations across the entire band, and (3) implement a dynamic database mechanism to manage access across the entire band. The DSA propose an approach to maximize the utility of the 37.0-37.6 GHz frequency band through dynamic sharing of spectrum. Similarly, ISED should move forward and designate the 64-71 GHz band for license-exempt operations on a no-protection, no-interference basis. The DSA appreciates that ISED's vision for 5G wireless services includes both licensed and license-exempt spectrum.

Question 7-3: ISED is seeking comments on the proposal to adopt the band plan as shown in figure 7 for the frequency band 37-40 GHz.

The DSA supports ISED's proposal to adopt a 37-40 GHz band plan harmonized with that developed by the FCC for the 37 GHz and 39 GHz bands. For the 37-37.6 GHz lower band segment the DSA recommends ISED establish a framework that authorizes licensed, license-by-rule, and license-exempt operations. We also recommend ISED authorize opportunistic access on a use-or share basis to unused capacity across the 37.6-40 GHz band segment. The sharing between licensed and licensed-by-rule users would be facilitated through a software-based Spectrum Access System (SAS), like that being certified for the three-tier-of-access spectrum sharing in the 3550-3700 MHz frequency band in the United States.

As with the upper portion of the band, we understand ISED intends to harmonize Canadian rules for the 37.0-37.6 GHz lower band with that of the United States. The FCC is proposing that this frequency band be shared on a non-exclusive basis between Federal and non-Federal users. The Consultation is silent on potential Canadian users of the frequency band.

The FCC is proposing a channel size of 100 MHz and allowing up to 600 MHz to be aggregated in an area, where available. The DSA proposed to the FCC that rather than setting a minimum channel size and spectrum aggregation limits, the SAS coordination mechanism would allow for variable channel sizes based on the actual bandwidth each user require in an area to maximize spectrum utilization. The DSA further suggested that the FCC consider the feasibility of authorizing indoor-only use of the 37 to 37.6 GHz band on an unlicensed-like basis. We believe that additional protections can be applied to minimize the risk that "signal leakage" from indoor-only use of the 37 – 37.6 GHz band could disrupt neighboring deployments. For example, requiring that these devices be AC-powered maybe one means to ensure that they only operate indoors. The DSA would like ISED to consider these options for the Canadian 37.0-37.6 frequency band.

Question 8-1: ISED is seeking comments on its proposal to designate the band 64-71 GHz for licence-exempt operations on a no-protection, no-interference basis.

In Canada, licensed-exempt operations are permitted in the 57-64 GHz ('60 GHz band'). The DSA strongly supports ISED's proposal to designate the 64-71 GHz frequency band for license-exempt operations on a no protection, no-interference basis. Extending the current license-exempt 60 GHz frequency band to 71 GHz, creates 14 GHz of contiguous license-exempt spectrum between 57 and 71 GHz and doubles the number of 2.16 GHz-wide channels available for high bandwidth applications. It would harmonize Canadian spectrum use of the 64-71 GHz band with the United States. And as ISED states in paragraph of the Consultation: *"There are no Canadian spectrum utilization policies addressing the frequency band 64-71 GHz. Furthermore, there are no existing users of the band by any service in Canada and ISED is not aware of any planned usage"*.

There are commercial IEEE 802.11ad-2012 compliant devices that will be able to access these additional channels once these channels become available. And the successor standard, IEEE 802.11ay, expected to be approved in 2019, will allow for the bonding of multiple 2.16 GHz channels. As a result of the FCC extending the 60 GHz band in the United States to 71 GHz and the anticipated IEEE 802.11ay standard, industry is working on line-of-sight devices and applications that will be able to take advantage of the high throughput and low latency possible.

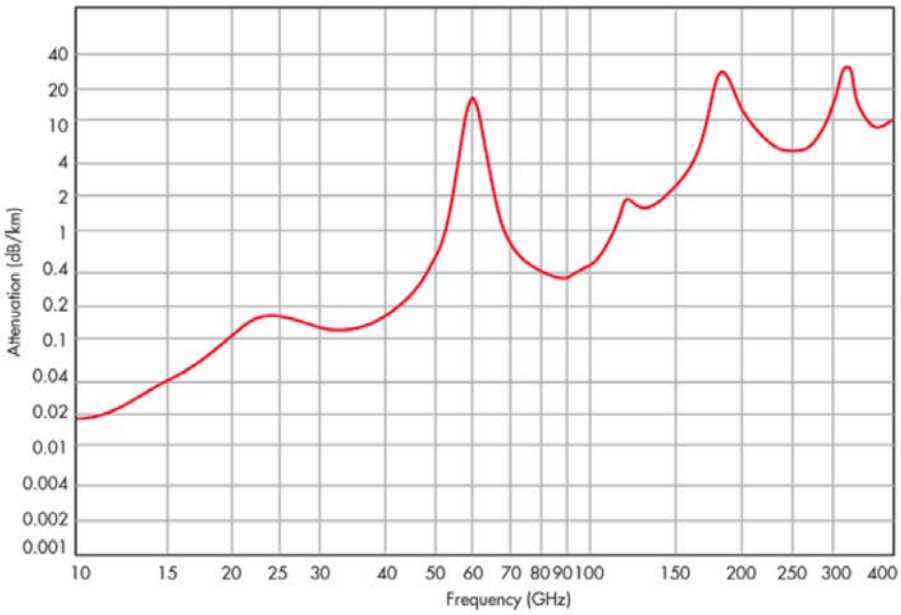

Figure 1. Millimeter Wave Signal Attenuation Characteristics Based on Oxygen and Water Absorption (Source: http://electronicdesign.com/communications/millimeter-waves-will-expand-wireless-future)

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It will also allow for license-exempt applications that are not feasible in the current 60 GHz band due to oxygen absorption in the frequencies around 60 GHz. The 64-71 GHz band provides for significantly better outdoor range than the 57-64 GHz band because transmissions in the higher frequencies experience less attenuation due to oxygen absorption (see Figure 1 above). The difference in attenuation between 60 GHz and 70 GHz 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.

In conclusion, the DSA supports ISED's initiation of the process to release millimetre wave spectrum in the 37-40 GHz and 64-71 GH bands to support the deployment of 5G wireless networks and systems. The DSA strongly supports ISED intention to authorize the 64-71 GHz frequency band for license-exempt use. For the 37-40 GHz band, the DSA proposes ISED authorize license-by-rule operations across the entire band on a secondary basis, establish a use-or-share requirement for licensed operations across the entire band, and implement a dynamic database mechanism to manage access across the entire band.

Respectfully submitted,

Kalpak Gude
Executive Director