



Technologies Canada Co. Ltd.

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**Dear Ms. Chevrier**

**Re: Comments from Huawei Technologies Canada Co., Ltd.**

Ref. the *Canada Gazette* Part I

Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G  
SLPB-005-18 – June, 2018

Huawei Technologies Canada Co., Ltd. (“Huawei Canada”) is pleased to submit these comments in response to the Innovation, Science and Economic Development Canada (“ISED”) Consultation (SLPB-005-18 – June 2018). Huawei Canada appreciates the opportunity to share with ISED our vision and experience related to future spectrum usage in the Millimeter Wave bands in Canada.

Huawei Canada understands that this addendum is initiating a consultation on releasing millimetre wave (mmWave) spectrum in the 26.5-27.5 GHz bands in addition to the bands identified in the initial mmWave Consultation (SLPB-001-17). Thus, these discussions are in the context of this proposed extension to the band. These comments should thus be taken in the context of this addition and our comments to the earlier Consultation. Huawei Canada would be pleased to work further with ISED and others in the industry to assist in this important spectrum planning process.

Sincerely,

Robert Backhouse  
VP Marketing and Solution Sales  
Huawei Technologies Canada Co., Ltd.

# **Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G**

## **Comments of Huawei Technologies Canada Inc.**

In comments to the previous consultation on Millimeter Wave Spectrum, some stakeholders suggested that ISED should consider releasing additional frequency bands above 24 GHz. The global 5G equipment ecosystem is expected to include the frequency range of 24.25–29.5 GHz and within this frequency range, the 26 GHz band is on the agenda for the World Radiocommunication Conference 2019 (WRC-19).

In response, ISED has proposed to make additional spectrum available through the *Addendum to the Consultation on Releasing Millimetre Wave Spectrum to Support 5G* (mmWave Consultation), published in June 2018. The addendum consultation proposes availability of millimetre wave (mmWave) spectrum in the 26.5–27.5 GHz band (26 GHz band) in addition to the bands identified in the initial mmWave consultation. This additional 1 GHz of spectrum in the 26 GHz band could make available a total of 1.85 GHz of mmWave spectrum to support the deployment of advanced communication systems, such as 5th generation (5G) wireless networks and systems.

These comments are in response to the specific questions in the addendum consultation.

**Question A1: ISED is seeking comments on the development of a flexible use licensing model for fixed and mobile services in the 26 GHz band (in addition to the bands currently under consultation through the mmWave Consultation), taking into account the timing of WRC-19, 5G technology standards development, international ecosystems and harmonization of spectrum use with other countries.**

**Question A2: ISED is seeking comments on the changes proposed above to introduce flexible use licensing in the 26 GHz band, including the ensuing changes to the CTFA Canadian footnotes and the policy on this band contained in SP 3-30 GHz, *Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation*.**

Q A1, A2: Huawei welcomes and supports ISED's proposal to make the (additional) 26.5-27.5 GHz band available for mobile/fixed services in Canada. Such arrangement and consequent changes in CTFA footnotes is in line with other global allocations<sup>1</sup> and will facilitate advanced 5G and subsequent services to Canadians both domestically and globally through roaming. The flexible use model enables users to allocate radio resources for access or backhaul according to the needs of the local area and geography.

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<sup>1</sup> As examples including: Sweden, Germany, Italy, Spain, UK, Korea, Finland have announced availability for 5G of 26.5-27.5 GHz.

**Question A3: ISED is seeking comments on the importance of harmonizing the Canadian band plan with the United States in the 26 GHz and 28 GHz bands, recognizing that the 26 GHz band is not available for 5G services in the United States at this time.**

Q A3: Huawei stresses the importance of alignment of Canadian band plans and channel assignments with international developments. Such alignment is fundamental for both the convenience of Canadians to receive services while abroad and to take advantage of global manufacturing economies of scale for harmonised equipment, particularly for mobile handsets. Such global harmonisation is necessary for Canadian industry to benefit from global market opportunities and standardization. Huawei notes that while the US assignment in the adjacent 28 GHz band is for two license “blocks” of 425 MHz, the deployments in the band will typically follow the global industry channel plan to facilitate interoperability across borders. Use of industry standard channel plans also facilitates interference mitigation techniques for cell areas adjacent to the border.

**Question A4: ISED is seeking comments on the minimum block size that should be made available for the 26.5–28.35 GHz band. Is it necessary that the frequency blocks be multiples of the 3GPP channel bandwidths (50 MHz, 100 MHz, 200 MHz and 400 MHz)?**

Q A4: Huawei observes that the blocks (of licensed frequencies) are best aligned with designated 3GPP channel plans. Such alignment permits use of internationally compatible equipment in the local market (and roaming services for Canadians abroad). A significant virtue of 5G services planned for the mmWave bands is to deliver high rate throughput utilizing wideband channels. Thus it is recommended that the minimum block size should be 200 MHz or larger to ensure that users can benefit from the wideband high-throughput capabilities of future systems. Assigning smaller block sizes would put operators at a disadvantage to deliver ultra-broadband services. Another disadvantage of smaller block sizes is that it compounds the number of licenses, which may increase the coordination required for interference management and synchronisation.

**Question A5:**

- A. ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services in the 26.5–27.5 GHz band to ensure coexistence with ISS.**
- B. If limits are proposed, ISED is inviting detailed proposals on what the limits should be, and why they should be implemented.**

Q A5: Huawei observes that imposing limits on the aggregate emissions from terrestrial services in these bands would be impractical due to the widely dispersed deployments, motion of the mobile users and the diurnal variation in traffic. Typically the terrestrial usage will be focused among stations on

the ground using beam directivity with limited radiation vertically. The ISS operation, also typically uses beams directed at other satellites in known orbits. The ground directed beams thus do not intersect the ISS beams except at the extreme range of the horizon and thus are of small aggregate effect due to the high loss consequent from the long propagation distance. The proximity of the 26.5–27.5 GHz band to the nearby water absorption line of the atmosphere assists inter-service coexistence at longer ranges due to the cumulative absorption loss. Huawei agrees with the ITU assessment that harmful interference to space stations due to aggregate emissions from terrestrial 5G services is not likely.

**Question A6:**

- A. ISED is seeking comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and EESS/SRS earth stations in the 26.5–27.0 GHz band when a pre-determined trigger threshold is exceeded.**
- B. If the proposed site-by-site coordination is supported, what coordination trigger and value would be the most appropriate (e.g. power flux density or distance threshold)?**
- C. ISED is also inviting proposals for specific additional technical rules for flexible use terrestrial stations and EESS/SRS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.**

Q A6: Huawei observes that in most cases a distance threshold for coordination with future proposed terrestrial EESS/SRS earth stations would be most practical. The distance may be adjusted to allow for effects of antenna gains and pointing direction. Within the distance threshold, if necessary, more detailed signal conditions and geographic features, shielding and elevations may be included in further studies.

**Question A7:**

- A. ISED is seeking comments on whether there should be restrictions on the geographic areas in which new EESS and SRS earth stations can be deployed in the 26.5–27.0 GHz band.**
- B. If geographic restrictions on EESS and SRS earth stations are proposed, ISED is inviting detailed proposals on how they could be implemented, and what areas should be targeted.**

Q A7: Huawei observes that for the 26.5-27 GHz band, in most cases deployment of new EESS/SRS stations would best be limited to geographic areas outside the most populated areas (i.e. areas of high terrestrial traffic) and sited or screened [coordinated] such that the potential for interference between EESS/SRS and the terrestrial mobile/fixed service areas is minimised. Commonality with the sharing mechanisms proposed for the “38-GHz” band may be appropriate with suitable scaling for wavelengths.

**Question A8:**

- A. ISED is seeking comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations [earth to space] in the 27.0–28.35 GHz band when a pre-determined trigger threshold is exceeded.**
- B. If the proposed site-by-site coordination is supported, what coordination trigger and value would be the most appropriate (e.g. power flux density or distance threshold)?**
- C. ISED is also inviting proposals for specific technical rules for proposed flexible use terrestrial stations and FSS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.**

**Question A9:**

- A. ISED is seeking comments on whether there should be restrictions on the geographic areas in which new FSS earth stations can be deployed in the 27.0–28.35 GHz band.**
- B. If geographic restrictions on FSS earth stations are proposed, ISED is inviting detailed proposals on how they could be implemented, and what areas should be targeted.**

Q A8, A9: Huawei observes that in most cases a distance threshold for coordination with terrestrial FSS earth stations would be most practical. The distance may be adjusted to allow for effects of antenna gains and pointing direction. Within the distance threshold, more detailed signal conditions, geographic features, shielding and elevations may be included in further deployment coordination studies. New FSS earth stations should be sited to take advantage of suitable distance and site shielding capabilities. It may be advantageous that new FSS earth stations not be sited near to populous areas with high terrestrial traffic.

**Question A10:**

- A. ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services in the 27.0–28.35 GHz band to ensure coexistence with FSS space stations.**
- B. If limits are proposed, ISED is inviting detailed proposals on why they should be implemented, and what the limits should be.**

Q A10: Huawei observes that imposing limits on the aggregate emissions from the terrestrial services in these bands would be impractical due to the widely dispersed deployments, motion of the mobile users and the diurnal variation in traffic. Typically the terrestrial usage will be focused among stations on the ground using beam directivity with limited radiation vertically, thus minimizing interference to the FSS space stations.