



September 15, 2017

Senior Director, Spectrum Licensing and Auction Operations

Innovation, Science and Economic Development Canada

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Re: **Gazette Notice SLPB-001-17**: Consultation on Releasing Millimetre Wave Spectrum to Support 5G

Dear **Senior Director**,

Summary

- 1 The BC Broadband Association (“BCBA”) is a group of telecommunications service providers, equipment suppliers and infrastructure constructors in Western Canada. We represent small internet service providers who operate in remote and rural parts of British Columbia and Alberta.
- 2 The BCBA is pleased to provide input to the process of releasing these bands to support the deployment of 5G technology in Canada.

Importance of Millimetre Wave Bands to Canadian Consumers

- 3 The spectrum bands under consideration in this consultation are important to bridging the digital divide, and achieving the CRTC’s universal service objective, in rural Canada.
- 4 All three of these bands, in particular the 28 GHz and 37-40 GHz bands, have the ability to deliver high-capacity backbone connections of 1 Gbps and above to rural communities and institutions. ISED has demonstrated their interest in delivering these backhaul connections through the CTI funding program, and spectrum policy should complement this funding program.
- 5 In addition, these three bands will enable new competitors delivering Gigabit connectivity to enter both urban and rural markets. Emerging 5G technologies have the potential to rival terrestrial fibre networks, and may prove transformative to the telecommunications industry, and disruptive to incumbent carriers.
- 6 If non-incumbent service providers are able to access these and other spectrum bands, rural Canadians will benefit from the increased availability of Gigabit services, and all Canadians will benefit from increased consumer choice.

BCBA’s Suggested Licensing Framework

- 7 In order to ensure the maximum benefit to Canadians from these bands, ISED should licence the spectrum differently in urban areas (cities over 500,000) and rural areas.

- 8 In rural areas, these bands should be licensed on a first-come-first-served (FCFS) basis, using either hexagonal grid cells or radio site licences. This will encourage deployment in these bands in rural areas by small regional service providers.
- 9 Cities with populations over 500,000 should be segmented from their surrounding tier-4 licence areas by appropriate boundaries, and spectrum licences for these cities should be auctioned. This segmentation will enable the surrounding rural communities to be served by these bands.
- 10 The two or three Tier-4 service areas with the highest population (i.e. Vancouver, Toronto, Montreal) might be auctioned as tier-4 areas, however we note that even these service areas contain rural communities at their peripheries.
- 11 In order to leverage these bands to enhance competition in the Canadian telecommunications market, these spectrum auctions should include set-asides for non-incumbent carriers and spectrum aggregation limits to ensure multiple competitors.
- 12 The BCBA supports un-licensed use of the 60 GHz band.

Responses to Questions

Question 4-1: Given the disruptive nature of 5G, will new business models and network applications develop that may require policy and regulatory consideration from ISED? Please describe potential new business models and network applications as well as their benefits to Canadians.

- 13 The disruptive nature of 5G is such that wireless systems can deliver speeds that rival fibre connections. This presents an opportunity for new competition, particularly in urban areas.
- 14 Companies that own fibre infrastructure will be driven to protect their investments by gaining control over the millimetre wave bands.
- 15 ISED must ensure that incumbent wireline carriers do not obtain control of all 5G spectrum. Spectrum aggregation limits and set-asides will be crucial to ensuring that Canadian consumers benefit from the full potential of these bands.
- 16 If non-incumbent providers are able to access these bands, Canadians would see more competition and choice.
- 17 With the potential introduction of new competitors using these bands to deliver fibre-equivalent speeds, ISED and the CRTC should ensure that these competitors are able to access infrastructure as mandated by existing regulations. Both ISED and the CRTC must ensure that incumbents show timely compliance with these regulations, for example by monitoring compliance with tower sharing rules.



Question 5-1: ISED is seeking comments on developing a flexible use licensing model for fixed and mobile services in the 28 GHz and 37-40 GHz frequency bands, and allowing licence-exempt use of the 64-71 GHz frequency band ahead of WRC-19 and before 5G technology standards are finalized.

- 18 The BCBA supports the flexible use licensing model for the 28 GHz and 37-40 GHz bands. These bands have the potential to deliver 1 Gbps and higher connectivity speeds to rural communities through fixed use, and to deliver high-capacity mobile data connections in urban areas.
- 19 Since the millimetre wave bands are less prone to interference than lower frequency bands, these bands would support a diversity of uses in rural and nearby urban areas.
- 20 The BCBA supports the unlicensed model in the 64-71 GHz band prior to the development of emerging standards, due to the low potential for interference in this band.
- 21 The millimetre wave bands should present a low risk of interference with systems in the United States. ISED might consider supporting European standards for these bands if U.S. standards appear to be less attractive due to technological, commercial, or regulatory constraints. For example, if the roll-out of dynamic frequency allocation database systems continues to progress slowly, Canada may do better to use alternate mechanisms.

28 GHz frequency band (27.5-28.35 GHz)

Question 6-1: ISED is seeking comments on the changes proposed above to introduce flexible use licensing in the 28 GHz band, including consequential changes to the CTFA domestic 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*.

- 22 The BCBA supports the changes proposed.

Question 6-2: ISED is seeking comments on the moratorium for new site-specific fixed service licences as described above.

- 23 The BCBA supports the moratorium.

Question 6-3: ISED is seeking comments on its proposal to adopt the band plan (as shown in figure 3 above) in the 28 GHz band.

- 24 The BCBA supports the proposed harmonization with the FCC band plan.
- 25 Sub-divisions of the proposed channels should be permitted. Multiple 1 Gbps connections could be delivered over a single 425 MHz channel in a rural community.



Question 6-4 A: ISED seeks comments on its proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the 28 GHz band when a pre-determined trigger threshold is exceeded.

Question 6-4 B: If site-by-site coordination is proposed, what coordination trigger and value would be the most appropriate (e.g. PFD or distance threshold)?

Question 6-4 C: ISED is also inviting proposals for specific technical rules on proposed flexible use stations and FSS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.

- 26 The BCBA supports the proposal to require site-by-site co-ordination between proposed terrestrial stations and FSS earth stations in the 28 GHz band.
- 27 The BCBA has no comment on the co-ordination rules between terrestrial and satellite systems in this band.

Question 6-5 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 28 GHz band.

Question 6-5 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.

- 28 The BCBA agrees that there should be some restrictions on the placement of FSS earth stations near populated urban areas.
- 29 The BCBA has no specific comment on geographic restrictions on the deployment of new FSS earth stations.

Question 6-6: ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services. If limits are proposed, ISED is inviting detailed proposals on why they should be implemented, and what the limits should be.

- 30 ISED should not impose limits on aggregate emissions from the terrestrial services, harmonizing with the FCC policy.

Question 6-7: ISED proposes that all existing FSS earth stations and those in applications pending approval for operation would be permitted to continue to operate under the current conditions of licence as described above. Comments are sought on this proposal.

- 31 The BCBA supports the continued operation of existing stations, and stations pending approval.



Frequency band 37-40 GHz

Question 7-1: ISED is seeking comments on the proposal to implement flexible use licensing in the frequency band 37-40 GHz, including the consequential changes to CTF A footnote C51, while continuing to allow for fixed-satellite service (space-to-Earth) in the band.

- 32 The BCBA supports the flexible-use licensing policy in the 37-40 GHz band. This band has the potential to deliver 1 Gbps and higher connectivity speeds to rural communities through fixed use. Flexible licensing will permit market forces to determine the best use of the spectrum in all service areas.

Question 7-2: ISED is seeking comments on whether a moratorium on the issuance of new licences under the *New Licensing Framework for the 24, 28 and 38 GHz Bands and Decision on a Licence Renewal Process for the 24 and 38 GHz Bands* is required at this time.

- 33 The BCBA supports a brief moratorium on the issuance of new licences, once the new licensing process has been finalized. However, a moratorium that persists for more than 6 months would curtail the deployment of 1 Gbps backbone links to rural communities.
- 34 The BCBA encourages ISED to develop a new licensing framework quickly in order to permit an ongoing deployment of high-capacity links in these bands.

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.

- 35 The BCBA supports the proposed band plan. This plan is more straightforward than the previous plan, and harmonized with the FCC band plan.

Question 7-4 A: ISED seeks comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the frequency band 37.5-40 GHz when a pre-determined trigger threshold is exceeded.

- 36 Site-by-site co-ordination between users is appropriate in this frequency band.

Question 7-4 B: If site-by-site coordination is proposed, what coordination trigger and value would be the most appropriate (e.g. PFD or distance threshold)?

- 37 A distance threshold would be more appropriate due to simplicity. This may result in some unnecessary co-ordination requirements where there is no potential interference, but with a threshold as close as 2 km, there would not be an un-manageable number of “false positives” except in heavily urbanized areas.



Question 7-4 C: ISED is also inviting proposals for specific additional technical rules on flexible use stations and FSS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.

- 38 Shielding and other requirements should not be imposed on terrestrial stations.

Question 7-5 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 frequency band 37.5-40 GHz.

Question 7-5 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?

- 39 The BCBA agrees that there should be some restrictions on the placement of FSS earth stations near populated urban areas.

- 40 The BCBA has no specific comment on geographic restrictions on the deployment of new FSS earth stations.

Question 7-6: It is proposed that, should SRS and/or MSS systems be deployed, flexible use licensees in the band 37.6-40 GHz may be subject to technical provisions to facilitate co-existence. Comments are sought. ISED notes that any such technical provisions would be established through a future consultation process.

- 41 Any technical provisions imposed in the future should not unduly disrupt established terrestrial networks.

Question 7-7 A: ISED is seeking comments on the options and implications for the treatment of incumbent licensees currently holding Tier 3 licences, the percentage that would apply to option 1 and supporting rationale.

- 42 BCBA members hold Tier-3, grid cell, and site-specific licences in the 37-40 GHz band.

- 43 The BCBA hopes that the new licensing process will permit small rural service providers to obtain spectrum in rural areas at low cost, and so to enhance the connectivity of rural communities in Canada. If spectrum is revoked from these service providers, and they are not able to obtain replacement spectrum at low cost, they will be forced to discontinue services in under-served rural communities.

- 44 While the flexible-use licences are indeed likely to be more valuable than fixed-use licences in urban areas, we believe that this will not be the case in smaller cities and rural communities. This spectrum will continue to be valuable for the purpose of delivering high-capacity backbone links in these environments.

- 45 A reduction in the amount of spectrum licensed in these rural deployments would result in a reduction in the capacity available to rural communities. ISED should not reduce the spectrum granted to existing users in rural markets.
- 46 The BCBA supports the conversion of Tier 3 fixed service licences to flexible use licences in licence areas that are outside of Canada's six largest metropolitan areas, with no reduction in spectrum quantity and no increase in licence fee.
- 47 The BCBA supports the proposal to allow the continued operation of grid-cell licences in this band, with protection from interference from new flexible use licensees, in areas that are outside of Canada's six largest metropolitan areas

Question 7-7 B: ISED is seeking comments on the options and implications for the treatment of incumbent licensees currently holding FCFS licences and supporting rationale.

- 48 ISED should allow existing licensees to continue operating, and be protected from interference.
- 49 While this may limit deployment of 5G in major urban areas, the displacement of existing licensees who are using spectrum will undermine confidence in ISED's licensing programs.

Frequency band 64-71 GHz for licence-exempt use

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.

- 50 The BCBA supports ISED's proposal to designate the 64-71 GHz band for licence-exempt operations.
- 51 As this band is suitable for links over very short distances, the potential for interference is low.

General spectrum access considerations in the 28 GHz and 37-40 GHz frequency bands

Question 9-1 A: ISED is seeking comments on whether flexible use access in these bands should be exclusively licenced or licence-exempt.

- 52 The BCBA supports the use of exclusive licensing in the 28 GHz and 37-40 GHz bands. The BCBA agrees with ISED's assessment that exclusive licences provide for a stronger investment environment.
- 53 Outside of Canada's populated urban areas, these bands should be licensed through a first-come-first-served licence process, using either radio site licences or hexagonal grid cell licences, in order to encourage the deployment of 1 Gbps services in rural areas.



Question 9-1 B: If a licencing approach is proposed, which types of licences (radio licences, spectrum licences with user-defined licence areas, spectrum licences with service areas for competitive licensing, or others) are expected to best lend themselves to licensing flexible use in the 28 GHz and 37-40 GHz frequency bands in order to support a variety of 5G technologies, applications and business cases?

- 54 The Tier-4 licence areas are too large to permit small rural service providers to use this spectrum to provide connectivity to rural communities. Grid-cell licensing areas or radio licences would be appropriate outside of populated urban areas (> 500,000).
- 55 The BCBA recommends that ISED define service areas encompassing populated urban areas, and auction the licences in these areas.

Question 9-1 C: ISED is seeking comments on whether a licence-exempt dynamic access using data base should be implemented in all, or portions of the 28 GHz, 37-40 GHz, particularly in the band 37-37.6 GHz.

- 56 The practical effectiveness of a dynamic access database has not yet been demonstrated. The BCBA suggests that ISED should not implement such a system until more feedback has been gathered from users of the proposed TVWS dynamic frequency allocation database, and from the similar databases mandated by the FCC.

Question 9-2: If an exclusive licensing approach is implemented, preliminary comments are sought on the benefits and risks related to longer licence terms for these frequency bands.

- 57 If radio licensing is used, licences should be issued annually, and given a very high expectation of renewal as long as the radio system is in place.
- 58 If spectrum licences are issued, a three to five year term would be appropriate. These shorter licence terms will encourage a more competitive market across Canada.

Question 9-3: If an exclusive licensing approach is proposed, ISED is seeking preliminary comments on possible measures that could support competition in light of the current conditions in the Canadian wireless service market and anticipated development and deployment of 5G services if flexible use licensing is developed through a spectrum licensing model.

- 59 The use of FCFS hexagonal grid cell licence areas or radio licences will promote investment into rural and remote communities. This licensing approach will encourage the participation of small providers, and will help small communities gain access to 1 Gbps and above backbone links.
- 60 We note that the Tier-4 service areas are not small enough to promote investment into rural communities. These service areas contain cities, elevating spectrum prices in these service areas beyond the reach of rural operators within these service areas and encouraging deployment only in the more urban portions of the service area.

- 61 In non-urban areas, licences in these frequency bands should be low-cost or no-cost.
- 62 In all licensing areas, the use of set-asides for non-incumbent carriers enables the development of new competition in broadband markets, bringing more choice to Canadian consumers.
- 63 Spectrum aggregation limits further ensure a healthy, competitive marketplace. The duration of spectrum aggregation limits should be at least as long as the initial licence term, in order to discourage speculative investment.
- 64 The BCBA thanks ISED for the opportunity to comment on this consultation.

Kind regards,

Rey Sonico
Secretary
BC Broadband Association