

Consultation on the Technical and Policy  
Framework for the 3650-4200 MHz Band  
and Changes to the Frequency Allocation of  
the 3500-3650 MHz Band  
(SLPB-002-02)

Comments of  
Ericsson Canada Inc.

October 26<sup>th</sup>, 2020

October 26, 2020

Sent by email to: [ic.spectrumauctions-encheresduspectre.ic@canada.ca](mailto:ic.spectrumauctions-encheresduspectre.ic@canada.ca)

**RE:** Canada Gazette, Part I, September 12, 2020, Notice No. SLPB-002-20 — Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band

Please find attached Ericsson's submission responding to the Canada Gazette, Part I, September 12, 2020, Notice No. SLPB-002-20 — Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band ("Consultation")

The document is being sent in Adobe Acrobat, using operating system Microsoft Windows 10 Enterprise version.

We appreciate the opportunity to provide comments and as always, we are ready to work with Innovation, Science and Economic Development (ISED) Canada in the future on this very important topic of mid band spectrum.

Sincerely,

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## INTRODUCTION

Ericsson appreciates the opportunity to respond to the Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band (the “Consultation”). Ericsson would like to commend Innovation, Science and Economic Development Canada (ISED) for inviting industry to comment on this very important issue of mid band spectrum.

Ericsson is one of the leading providers of Information and Communication Technology (ICT) to service providers. We enable the full value of connectivity by creating game-changing technology and services that are easy to use, adopt, and scale, making our customers successful in a fully connected world.

Founded in 1876, Ericsson is a global company with a long history that values innovation and invests in technology for good. Ericsson believes in a strong R&D culture with more than 25,100 of our 99,000 employees involved in R&D, and more than 54,000 granted patents. In fact, independent firm Bird & Bird identified Ericsson as the leader in patent holdings with more than 15 percent of standard essential 5G patents (SEP’s) recently<sup>1</sup>.

**FIGURE 1: Standard Essential 5G Patents (i.e. "SEPs")**



More importantly, Ericsson has been successfully converting its strong technical leadership into commercial achievements with 112 commercial 5G announcements or contracts with unique operators and 65 live 5G networks around the globe<sup>2</sup>.

<sup>1</sup> <https://www.twobirds.com/en/news/articles/2019/global/pattern-team-examine-difficulties-in-leadership-of-companies-in-5g-patent>

<sup>2</sup> <https://www.ericsson.com/en/5g#live-5g-networks>

In Canada, Ericsson has operated since 1953 and serves Canadian operators, enterprises and media companies by providing complete communication solutions, including mobile and fixed broadband network infrastructure, managed services and software.<sup>3</sup>

As one of Canada's ten largest Research and Development (R&D) investors, Ericsson Canada has invested more than \$4 Billion CAD over the last 10 years. Ericsson has more than 2,400 employees and offices across Canada, including in Toronto, Ottawa, and Montreal, where Ericsson fulfills worldwide mandates in the development, testing and support of wireless networks.

Ericsson has actively participated in the Radio Advisory Board of Canada (RABC) working group and supports many of the positions put forward. Below are Ericsson's response to several questions and additional information pertinent to this Consultation.

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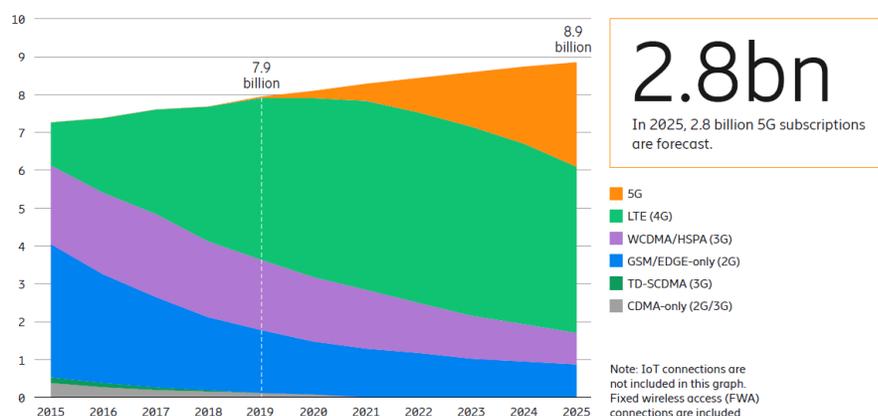
<sup>3</sup> <http://www.ericsson.com/ca/>

## EXECUTIVE SUMMARY

The global crisis brought on by the coronavirus pandemic has highlighted the importance of reliable, secure connectivity, with work and learning occurring remotely, away from the normal workplace and school environments. Business and consumers activities have been shifted more and more towards online environments. These changes in behaviour are likely to have lasting effects even after the economy starts to pick up and will impact various industry trends and projections. In the latest issue of the Ericsson Mobility report, it has been found that “...in some markets 5G subscription growth has slowed as a result of the pandemic, this is outweighed by other markets where it is accelerating, leading us to raise our forecast of global 5G subscriptions at the end of 2020”<sup>4</sup>.

Our estimate of the number of 5G subscriptions has been revised upward to about 190 million by the end of 2020 and 2.8 billion by the end of 2025, roughly around 30 percent of all mobile subscriptions at that time (Figure 2). 5G subscription uptake is expected to be significantly faster than for 4G or any previous generation.

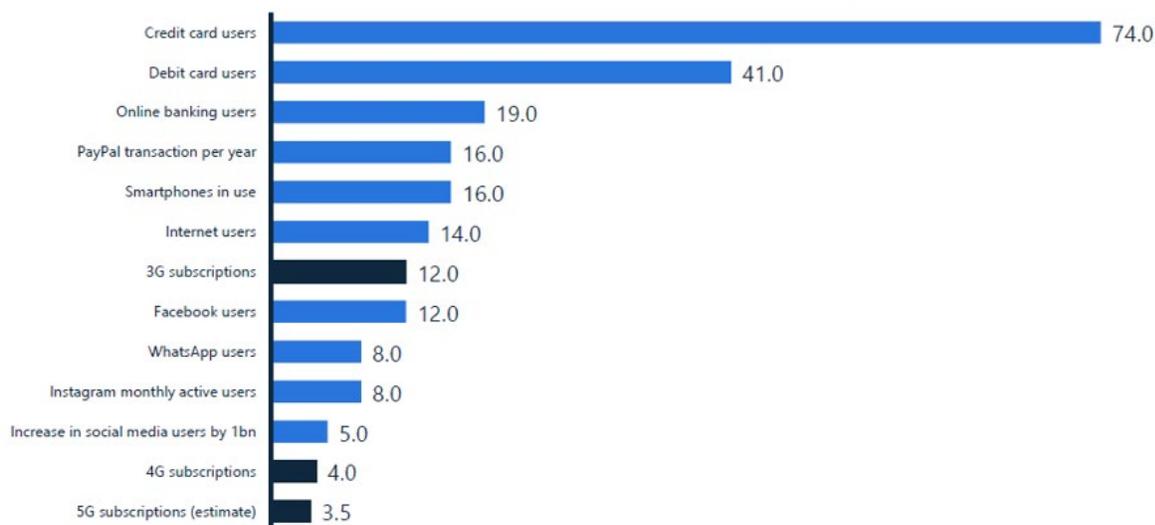
**FIGURE 2: Mobile subscriptions by technology (billion)**



<sup>4</sup> <https://www.ericsson.com/en/mobility-report/reports/june-2020>

In fact, 5G is expected to reach one billion users faster than any other technology phenomena!<sup>5</sup>

**FIGURE 3: Time needed to reach 1 billion users (in years)**



However, it is not adequate and accurate to measure the success of 5G in the number of subscriptions alone. It is even more important to look at the economic and social values that 5G brings by enabling new use cases and applications in industry and society that defy imagination. For example, today’s video calls would be replaced with 5G holographic calls – an essential connectivity tool that could bring friends and family together in time of isolation<sup>6</sup>. A Smart Port with its “digital twin” will increasingly become a mixture of physical machinery, robotics systems, automated vehicles, human-operated digital platforms and AI-based software systems - that can operate autonomously, can be configured and customized based on real life data fed back into the system<sup>7</sup>.

From an economic standpoint, several reports have pointed to 5G’s significant economic contribution. The World Economic Forum report indicated that “*Intelligent connectivity, enabled by 5G, will be a catalyst for socio-economic growth in the Fourth Industrial Revolution with an estimated \$13.2 trillion of global economic value reached by 2035*”<sup>8</sup>. For Canada, an Accenture report described that “*the adoption of 5G technology in Canada will propel innovation across industries and significantly improve*

<sup>5</sup> <https://www.statista.com/study/74670/a-mobile-connected-world/>

<sup>6</sup> <https://www.ericsson.com/en/news/2018/11/3d-holographic-calls-with-5g>

<sup>7</sup> <https://www.ericsson.com/en/reports-and-papers/ericsson-technology-review/articles/technology-trends-2020>

<sup>8</sup> [http://www3.weforum.org/docs/WEF\\_The\\_Impact\\_of\\_5G\\_Report.pdf](http://www3.weforum.org/docs/WEF_The_Impact_of_5G_Report.pdf)

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*Canadians' quality of life and the economy to the tune of a nearly \$40B annual GDP uplift by 2026. The benefits will be felt not only in national GDP, but also in terms of Canadian jobs. It is estimated that by this same time close to 250K permanent jobs will be added to the Canadian economy”<sup>9</sup>.*

With such significant positive economic and social contribution by 5G, Ericsson believes that spectrum policy needs to take into consideration the cost of missed opportunity to launch 5G services in a timely manner because of lacking suitable spectrum or unnecessary regulatory constraints that prevent taking full advantage of 5G capabilities. As indicated in the Consultation, *“Spectrum is a critical resource for wireless carriers. Additional spectrum for flexible use will enable providers to increase network capacity to meet the traffic demands of higher usage rates and support the provision of next-generation wireless technologies.”<sup>10</sup>*, Ericsson believes that efficiently and timely repurposing of C-band spectrum, while retaining incumbent services where it is needed, will bring great social, economic impacts to Canadians and Canadian society. In addition, as noted in the Consultation, *“The development and deployment of 5G technologies is essential to Canada becoming a global centre for innovation and will bring Canada to the forefront of digital development and adoption through the creation and strengthening of a world-class wireless”<sup>11</sup>.*

In following the above principles and with respect to a number of technical questions, below are a few key recommendations to ISED:

- Ericsson recommends that ISED devise a long-term plan to phase-in the allocation of the bands 3400-4200 MHz and 3300-3400 MHz for mobile service in partial fulfillment of Recommendation 207 (Rev. WRC 19) “Future IMT systems” as well as Recommendation ITU-R M.2083 (IMT Vision - “Framework and overall objectives of the future development of IMT for 2020 and beyond”). It is noted in the Consultation that the band 3300-4200 MHz matches the 3rd Generation Partnership Project (3GPP) band n77 for 5G services. This would set a global example that not only other countries in Region 2 (including the U.S.) could follow, but all other countries in Region 1 and Region 3.
- In line with ISED’s remark in the decision on revisions to the 3500 MHz Band<sup>12</sup>, Ericsson recommends ISED initiate studies with the goal to expedite the clearing and licensing 3400 - 4200 MHz for 5G services taking into consideration such factors as demands/supply of valuable

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<sup>9</sup> [https://www.5gce.ca/wp-content/uploads/2018/06/CWTA-Accenture-Whitepaper-5G-Economic-Impact\\_Updates\\_WEB\\_06-19-2018.pdf](https://www.5gce.ca/wp-content/uploads/2018/06/CWTA-Accenture-Whitepaper-5G-Economic-Impact_Updates_WEB_06-19-2018.pdf)

<sup>10</sup> The Consultation, page 4, paragraph 5

<sup>11</sup> The Consultation, page 4, paragraph 5

<sup>12</sup> SLPB-001-19, page 3, paragraph 8 “*The Spectrum Outlook also noted that, internationally, the 3500 MHz band is now considered one of the key bands for future 5th generation (5G) technologies and that there have been developments towards making the larger 3400-4200 MHz band available for flexible use. Comments from the Outlook Consultation indicated support for a review of the 3400-4200 MHz band*”

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spectrum resources, economic implications, technical issues and protection, maintaining of necessary incumbent services that are beneficial to all Canadians. Specifically:

- The 3400-3450 MHz band which has garnered a healthy discussion in RABC's working group.
- The 4000-4200 MHz band which is partially addressed in Telesat's proposal to clear 4000-4100 MHz.
- Particularly for the 3650-4200 MHz band addressed in this consultation, to facilitate the deployment of 5G services, Ericsson recommends changes to the Canadian Table of Frequency Allocation (CTFA) that, by the transition deadline:
  - Remove the primary allocation to FSS from 3650-4000 in all non-satellite dependent areas.
  - Retain the primary allocation to FSS in satellite-dependent areas in the full band 3700-4200 MHz, however, keep track of these licenses including location, frequencies, etc., to facilitate coordination and future transition, including clearing of the band.
  - Add a primary mobile service, except aeronautical mobile, allocation in the 3700-4000 MHz (more details are provided in the answer to question Q4).
- Facilitate the harmonization of rules and regulations for the band in discussion, 3650-4000 MHz, with European Union (EU) and U.S. to leverage large equipment ecosystems. Specifically, with the recently released technical rules for 3450-3650 MHz allowing Canada to leverage the European Union (EU) equipment ecosystem, it is desirable to have one Radio Standards Specification (RSS) for flexible use equipment in the 3450-3700 MHz and 3700-4000 MHz bands without technical rules more stringent than the already existing EU and U.S. rules.
- Clarify the definition of "Satellite-Dependent Areas": the definition should not be rigidly bound to a geographical notation (Tier 4, Tier 5, etc.) but should be flexible enough to take into consideration changes happening over time: technology advancements, demographical changes, evolving business cases in bringing broadband to users and so on. An area may be a satellite-dependent area today but over time will be able to rely on, in addition to satellite, other terrestrial technologies to delivery broadband services. For other very remote, very low population density areas, satellite may be the only means to provide broadband for the foreseeable future.
- Continue to monitor FSS licenses (usage, location, frequency, etc.) in the C-band with the goal to completely clear out the range 3700-4200 MHz considering all the factors mentioned previously:
  - Supply and demand of spectrum
  - Social impacts and economic implications, including missed opportunity
  - Maintenance of incumbent services that are necessary for Canadians
  - Technical requirements

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## COMMENTS ON SPECIFIC QUESTIONS

### Section “5.2 Development of the 5G equipment ecosystem”

#### **Q1**

*ISED is seeking comments on the timelines for the development of an equipment ecosystem using 5G technologies in the 3800 MHz band. In particular:*

- a) the ecosystem maturity level and readiness of equipment under band classes n77 or n78 for the Canadian market*
- b) the ability of existing or future base station radios to handle multiple technologies and band classes at the same time (i.e. whether all four band classes (B42, B43, n77 and n78) or a subset of these band classes are able to operate on the same base station radio) and how it may affect the adoption of 5G technologies in the 3800 MHz band*

Ericsson agrees with RABC’s view that the equipment ecosystem under band class n78 (3300-3800 MHz) is currently more mature than n77 (3300-4200 MHz). Both n77 and n78 equipment will be mature at the time of deployment of 3800 MHz in Canada. Further information on user devices can be found on the GSA Global mobile Suppliers Association (GSA)<sup>13</sup> website which currently lists 233 devices for band n78 and 153 devices for band n77.

#### **Q2**

*ISED is seeking comments on the potential linkages between the equipment ecosystems using 5G technologies in the 3500 MHz and 3800 MHz bands. In particular:*

- a) whether contiguity between the 3500 MHz band and 3800 MHz band is preferred given that 3GPP specifications allows for non-contiguous carrier aggregation*
  - b) whether there are any technical or operational impediments (e.g. equipment limitations/challenges to support aggregated use of spectrum, or requirements for additional base station radios) that would be incurred if operators have a large frequency separation between frequency blocks in one or both bands, and at what point (i.e. how wide the frequency separation) such impediments would become significant*
  - c) whether the equipment ecosystem deployed for the 3500 MHz band will be able to operate in the 3800 MHz band, and whether this equipment could easily be extended to 3800 MHz after being deployed*
- In providing comments, respondents are requested to include supporting arguments and rationale.*

Contiguous blocks are preferred although 3GPP specifications allow non-contiguous carrier aggregation.

To realize the full potential of 5G, in our view, at least 100 MHz is needed on a per operator basis to achieve in an effective manner the minimum bandwidth requirement set up in Report ITU-R M.2410<sup>14</sup>.

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<sup>13</sup> <https://gsacom.com/gambod/>

<sup>14</sup> Report ITU-R M.2410 “Minimum requirements related to technical performance for IMT-2020 radio interface(s)”.

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**Q3**

*ISED is seeking comments on how the difference in technical rules between the U.S. and EU could impact Canada's ability to leverage the economies of scale from the global 3800 MHz ecosystem. In particular:*

- a) would the difference in technical rules (such as out-of-band-emission (OOBE) power limits) result in two distinct region-specific equipment ecosystems*
- b) which equipment ecosystem would be more suitable in the Canadian environment (noting that Canada has, for the most part, aligned with the U.S. on low- and high-band spectrum for 5G but in the mid-band, Canada is more aligned with the EU in the 3500 MHz band (3450-3650 MHz)) and specifically, whether Canada should generally align its technical rules with the U.S. or the EU in the 3800 MHz band*

*In providing comments, respondents are requested to include supporting arguments and rationale.*

Ericsson agrees with RABC's position. With the recent FCC's decision and the upcoming auction scheduled in December 2020, Canada should harmonize the band 3700-4000 MHz with the U.S. to the maximum extent possible.

It is noted that the recently issued standards (Radio Standards Specification (RSS) 192 and Standard Radio System Plan (SRSP) 520) for the band 3450-3650 MHz, are mostly aligned with EU regulation. Further investigation will be needed as we are dealing with differences in technical rules in the U.S. in the range 3700-3980 MHz and in the EU rules within 3400-3800 MHz. It is important to ensure the whole band 3450-4000 MHz can be addressed in a single technical standard (RSS) and to avoid different equipment specifically needed for Canada. In addition, for Canadian standards, requirement for the full band 3450 – 4000 MHz should not be more stringent than the existing standards (for EU and U.S.), taking into consideration the needs of coordination and avoidance of harmful interference to protected neighbouring services.

Ericsson is also hopeful that subsequent alignment with 3GPP band n77 may be possible at a future date through the addition of 3300-3450 MHz.

In addition, user devices designed for band n77 and n78 should be useable in the Canadian market without specific requirements on emissions that deviate from EU and U.S. regulations. Such an objective would allow truly global reach for the device ecosystem.

**Section "7.1 Introduction of mobile service in the 3700-4000 MHz band"****Q4**

*ISED is seeking comments on the proposal to add a primary mobile service, except aeronautical mobile, allocation in the 3700-4000 MHz band to the CTFA and the specific changes shown in annex B. In providing comments, respondents are requested to include supporting arguments and rationale.*

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Ericsson agrees with the Department's assessment that "*Frequency allocations are an important first step in developing spectrum utilization policies that foster the implementation of new radiocommunication services. Modifications to the CTFA are implemented as required to enable the introduction of new wireless services that benefit Canadians and respond to marketplace demands*"<sup>15</sup>.

Therefore, Ericsson agrees with the Department's proposal to add a primary allocation for the mobile service, except aeronautical mobile, in the 3700-4000 MHz band, including changes to the Canadian Table of Frequency Allocations (CTFA) as given in Annex B of the Consultation allowing the introduction of mobile services on a primary basis in the 3700-4000 MHz band. As described in the Consultation, this action is aligned with the International Telecommunication Union Radio Regulations (i.e. "MOBILE except aeronautical mobile") in allocating primary mobile in this band and harmonized with the U.S. allowing mobile use in the 3700-4000 MHz band.

However, as discussed earlier, the long-term objective is to have mobile service in the full band 3400-4200 starting with changes to the CTFA by adding a primary allocation in 3300-4200 with appropriate footnote(s).

## **Q5**

*ISED is seeking comments on developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band.*

*In providing comments, respondents are requested to include supporting arguments and rationale.*

Ericsson supports developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz as it is in line with ISED's policy objectives of promoting innovation and delivery of broadband connectivity<sup>16</sup>. In addition, as discussed in question 3, Canada should harmonize with the U.S. in the band 3700-4000 MHz.

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<sup>15</sup> The Consultation: page 16, paragraph 53

<sup>16</sup> The Consultation: page 57, paragraph 17: "*The 3650-4000 MHz band provides opportunities to promote innovation and early adoption of 5G technologies under a flexible use licensing model. Flexible use licensing would enable licensees to better align their services to the needs of their customers. This approach is intended to enable new technology and innovations to evolve, while supporting a variety of different needs and use cases, such as broadband for high-speed Internet, and support the growing demand for new 5G services*"

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## Section “7.3 Changes to the FSS use in the 3700-4200 MHz band”

### Harmonization of FSS use

#### Q6

*Given the proposal in section 7.2 on developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band, ISED is seeking comments on the proposal that no new FSS earth stations be authorized in the 3700-4000 MHz band in the future and that the authorization of new FSS earth station licences be limited to the 4000-4200 MHz band.*

Ericsson supports ISED’s proposal not to authorize any new FSS earth stations in the 3700-4000 MHz band in the future. In addition, in line with ISED’s outlined Spectrum Outlook and supported by others, the band 4000-4200 MHz should be in consideration for flexible use in the future.

### Guard band between flexible use and FSS

#### Q7

*ISED is seeking comments on the proposal to implement a 20 MHz guard band between 3980-4000 MHz to protect FSS operations in 4000-4200 MHz band from proposed flexible use operations in the 3700-3980 MHz band.*

With the objective to harmonize with the U.S., Ericsson supports the proposal of implementing a 20 MHz guard band between 3980-4000 MHz as described above.

### Maintaining FSS services in satellite-dependent areas

#### Q8

*ISED is seeking comments on the proposal to maintain a primary allocation to FSS in the entire 3700-4200 MHz band and the proposal that existing FSS earth stations in satellite-dependent areas remain licensed in the entire 3700-4200 MHz band.*

For satellite-dependent areas, Ericsson supports ISED’s recommendation to:

- Maintain a primary allocation to FSS in the entire 3700-4200 MHz.
- Permit existing FSS earth stations in satellite-dependent areas remain licensed in the entire 3700-4200 MHz band.

Ericsson also noted that:

- “... the FCC made the decision to maintain FSS operations in the 3700-4200 MHz band in these areas, to ensure sufficient capacity for services in more remote areas outside of the contiguous U.S., such as Hawaii, Alaska and Puerto Rico.”<sup>17</sup>
- Telesat’s proposal does not rely on the concept of “satellite dependent areas”. However, the Telesat proposal clearly identifies specific gateways that require protection.<sup>18</sup>

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<sup>17</sup> The Consultation, page 21, paragraph 70

<sup>18</sup> Telesat’s Proposal, page 24, paragraph 52

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Both FCC and Telesat consider specific locations rather than a general definition of satellite dependent areas, Ericsson proposes:

- Clarify the definition of “Satellite Dependent Areas”: the definition should not be rigidly bound to a geographical notation (Tier 4, Tier 5, etc.) but should be flexible enough to take into consideration changes happening over time: technology advancements, demographical changes, evolving business cases in bringing broadband to users and so on. An area may a satellite-dependent area today but over time will be able to rely on, in addition to satellite, other terrestrial technologies to delivery broadband services. In this manner, the elimination of dependency should be a goal. For other very remote, very low population density areas, satellite may be the only mean to provide broadband for the foreseeable future.
- Continue to monitor and study the exact current installed and future demand of FSS in the C-band with respect to the change factors in previous bullet and the role of Ku and Ka bands. This action would help to maximize the use of C-band and better understanding of how to maintain and migrate FSS services to Ku and Ka bands in the future.

### **Q9**

*ISED is seeking comments on the future demand for C-band in rural and remote areas such as the North, including the following:*

- a) the trend towards using higher frequencies by FSS operations to provide broadband connectivity*
- b) the ability of using higher frequencies to replace current C-band capacity and the potential timelines*
- c) the possibility of a trend towards using 4000-4200 MHz in combination with other connectivity options (e.g. higher frequencies satellites or wireline solutions) and when it would be expected to be available for satellite-dependent areas*

Ericsson would like to reiterate what is already included in RABC’s submission. Based on CRTC’s report “Satellite Inquiry Report”<sup>19</sup> and CRTC’s Telecom Decision CRTC 2016-127<sup>20</sup>, particularly paragraph 14-26, Ericsson believes that Ku and Ka band can be a substitute for C-band specially when it comes to broadband internet service. Many companies provide voice service in the form Voice over IP (VoIP) in the Ku and Ka band instead of providing legacy voice system in the C-band.

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<sup>19</sup> <https://crtc.gc.ca/eng/publications/reports/rp150409/rp150409.htm>

<sup>20</sup> <https://crtc.gc.ca/eng/archive/2016/2016-127.htm> (paragraph 14-26)

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## **Section “7.4.1 Change in status of FSS in 3500-3650 MHz”**

### ***Q11***

*ISED is seeking comments on its proposal to remove the FSS allocation in the 3500-3650 MHz band and to suppress Canadian footnote C20 in the CTFA as detailed in annex B. In addition, ISED is seeking comments on the proposed grandfathering of the existing earth station operations listed in annex C, such that fixed or mobile stations in the 3500-3650 MHz band will be required to coordinate with these earth stations as specified in SRSP-520.*

*In providing comments, respondents are requested to include supporting rationale and arguments.*

It is understood that this question deals specifically with only two remaining earth stations<sup>21</sup>. In that context, Ericsson supports ISED’s proposal.

## **Section “7.4.2 Change in status of FSS in 3650-3700 MHz”**

### ***Q12***

*ISED is seeking comments on its proposal to remove the primary FSS allocation from 3650-3700 MHz and suppress Canadian footnote C33 in the CTFA as detailed in annex B.*

*In providing comments, respondents are requested to include supporting rationale and arguments.*

Ericsson supports ISED’s proposal which is in line with Ericsson’s view of removing primary allocation to FSS service up to 4000 MHz in all non-satellite dependent areas. This action facilitates the deployment of flexible usage 5G systems.

## **Section “9.1.1 Proposal for treatment of WBS incumbents”**

### ***Q14***

*Subsequent to changes to the spectrum utilization described in section 7 and recognizing the need to change the current WBS licensing model, ISED is seeking comments on its proposal to displace the existing WBS licensees and designate 80 MHz of spectrum available for the development of a new shared licensing process in the 3900-3980 MHz band as described in Option 2. Specifically, ISED is seeking comments on:*

- a) the amount of spectrum proposed (80 MHz) under a shared spectrum licensing process*
- b) whether there should be a provision that allows certain users (e.g. existing WBS licensees) priority licensing (e.g. an initial application window before accepting applications from others)*

*Preliminary comments on a future shared spectrum licensing process are being sought in section 9.1.4 below.*

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<sup>21</sup> The Consultation, page 23, end of para 75 “Therefore, ISED proposes that the two earth stations be grandfathered and their existing operations be protected in accordance with these provisions within the 3500-3650 MHz band until the end of life of the existing satellites. ISED further proposes to suppress Canadian footnote C20 in the CTFA accordingly”

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While the RABC working group brought up the option of the band 3400-3450 MHz for shared spectrum (Option 4 in RABC’s submission, paragraph 48), Ericsson would like to emphasize different initiatives to allocate this band for terrestrial mobile services. For example, ISED noted the decision for 3500 MHz<sup>22</sup>, “many countries are including this band in their plan for 5G flexible use and equipment is being developed to support this frequency range”. ITU RR No. 5.43323 indicates that administrations with the radiolocation service allocated on a primary basis in the band 3400-3600 MHz, are urged to cease operations by 1985. Currently, the U.S. is looking at different methods to vacate a range of spectrum between 3.1-3.35 GHz in phases.<sup>24</sup>

As discussed in question 1, based on the GSA report, equipment ecosystems for n77 and n78 user devices that cover the band 3400-3500 MHz, are quite mature with more than hundreds of devices available.

Faced with a mature equipment ecosystem and the pent-up demand for additional spectrum for terrestrial mobile services, Ericsson recommends ISED start reviewing the current usage of the band 3400-3450 MHz, similar to the U.S. approach for the 3450-3500 MHz, to clear the band for terrestrial mobile services.

### **Section “9.1.2 Proposed transition period for the displacement of WBS licensees”**

#### ***Q16***

*Based on the proposal to implement Option 2, ISED is seeking comments on the proposed displacement deadlines, with WBS operations in urban areas being displaced by December 2023 and all others by December 2025. Respondents are invited to propose other protection and displacement options for consideration, provided they include a strong rationale.*

Ericsson would like ISED to consider technical issues related to coordination of adjacent services and cross border coordination in deciding the displacement deadlines.

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<sup>22</sup> SLPB-001-19 ( Decision on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Decisions on Changes to the 3800 MHz Band) published June 2019: Para 55: “As sharing technologies continue to evolve, ISED is exploring other mechanisms for optimizing spectrum use in the 3400-3450 MHz band. Many countries are including this band in their plans for 5G flexible use, and equipment is being developed to support this frequency range. However, while radiolocation is intermittent in nature, this interference may be more pronounced in areas close to large ports, airports, the border, and other areas where radars are located. Further work is required to address the complexities of potential interference issues with radiolocation services operating in Canada, along the Canada-United States border and in Canadian coastal waters.”

<sup>23</sup> 5.433 In Regions 2 and 3, in the band 3 400-3 600 MHz the radiolocation service is allocated on a primary basis. However, all administrations operating radiolocation systems in this band are urged to cease operations by 1985. Thereafter, administrations shall take all practicable steps to protect the fixed-satellite service and coordination requirements shall not be imposed on the fixed-satellite service.

<sup>24</sup> <https://www.fcc.gov/document/fcc-seeks-facilitate-5g-345-355-ghz-band-0> , paragraph 2 “Now, we build on these efforts to unleash additional much-needed mid-band spectrum for flexible use, turning our focus to 3100-3550 MHz”

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**Section “9.1.4 Initial consideration of the shared spectrum licensing process for 3900-3980 MHz”**  
**Q19**

*ISED is seeking preliminary comments on the future spectrum licensing process for 3900-3980 MHz, including the following:*

- a) what type of applications are envisioned for this spectrum*
- b) what type of shared licensing process ISED should consider (e.g. database approach, licensee to licensee coordination)*
- c) what additional measures ISED should consider employing to manage access to the band in high demand areas, such as major metropolitan centres*
- d) what technical restrictions should be considered (e.g. technical rules similar to adjacent 3500 MHz flexible use band with reduced power levels, a guard band between new flexible use systems below 3900 MHz, shared use above 3900 MHz, etc.)*
- e) what type of eligibility criteria, if any, should be established*

Ericsson supports spectrum policies that maximize the value of spectrum for social and economic benefits. It is important to avoid spectrum policy that may:

- Delay deployment of innovative wireless technologies.
- Introduce technologies that require guard band and therefore waste valuable spectrum.
- Create unnecessary constraints that prohibit fully taking advantage of technologies’ capabilities.
- Burden service providers with complex coordination processes.
- Force development of equipment that is unique for Canadian market.

**Section “9.2.1 Proposal for treatment of FSS incumbents in 3650-3700 MHz”**  
**Q20**

*ISED is seeking comments on its proposal that existing FSS earth stations licensed in 3650-3700 MHz after June 11, 2009, be permitted to continue to operate on a no-protection basis with respect to proposed new flexible use operations.*

*In providing comments, respondents are requested to include supporting rationale and arguments.*

Ericsson supports ISED’s proposal as described above that these existing earth stations which were licensed after June 11, 2009, continue to operate under no protection. In addition, Ericsson recommends ISED continue monitoring and keeping track of existing earth stations. This will help to have a better understanding of FSS usage, demand/supply and to help plan the clearing of FSS in general.

## **Section “9.3 Definition of satellite-dependent areas”**

### ***Q21***

*ISED is seeking comments on whether the Tier 4 service areas identified for exemption of certain provisions in GL-10 for mmWave bands as listed in annex E would be appropriate to apply for FSS operations in the 3700-4200 MHz band. ISED invites alternative proposals for areas that would be considered satellite-dependent (e.g. based on Tier 5 categories).*

Ericsson generally shares RABC’s view on this topic. However, in addition to the issues raised in the RABC’s response, it is important to recognize changes could happen over time. The definition of satellite-dependent areas should not be rigidly bound to a geographical notation (Tier 4, Tier 5, etc.) but should be flexible enough to take into consideration changes happening over time: technology advancements, demographical changes, evolving business cases in bringing broadband to users and so on. An area may be a satellite-dependent area today but over time will be able to rely on, in addition to satellite, other terrestrial technologies to delivery broadband services. For other very remote, very low population density areas, satellite may be the only means to provide broadband for the foreseeable future.

### ***Q22***

*ISED is seeking comments on whether certain remote industry operations, for example offshore oil drilling platforms, should be included in the definition of satellite-dependent areas. In providing comments, respondents are requested to include supporting rationale and arguments.*

Ericsson does not believe remote industry operations should be included in the definition of satellite-dependent areas. Generally, one of the main challenges for these operations is not about local coverage, with the myriad of available terrestrial technologies, but rather backhaul traffic which could be met with satellite, microwave or sub-terrain, submarine cables.

### ***Q24***

*ISED is seeking comments on its proposed date of December 2023 as the Canadian FSS transition deadline.*

Ericsson would like ISED to consider the U.S. transition deadlines, cross border coordination for both terrestrial services and satellite services in deciding the transition deadlines.

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## **Section “9.5 Existing licensed FSS earth stations in 3700-4200 MHz”**

### ***Q27***

*ISED is seeking comments on its proposed transition deadline of December 2023 for FSS earth stations, in which existing FSS earth station licences would be modified to 4000-4200 MHz in the relevant areas.*

Ericsson would like ISED to consider cross border coordination for both terrestrial services and satellite services in deciding transition deadlines. Looking further ahead with the objective of making the larger 3400-4200 MHz band available for flexible use, this is an opportunity to monitor the demand and usage for FSS earth station licenses modified to transition to the 4000-4200 MHz band. A better understanding of FSS usage which will facilitate the clearing of 4000-4200 MHz for flexible usage in the future at the same time, will ensure Canadians continue to have the most suitable options for broadband services depending on their circumstance.

### ***Q29***

*ISED is seeking comments on the proposed change to the CTF A to add the new footnote CZZ proposed above and shown in annex B.*

Ericsson agrees with ISED’s proposal. However, as mentioned previously, the definition of satellite-dependent areas must take into account changes over time. In addition, also discussed previously, Ericsson sees the value of continuous monitoring of FSS usage in satellite-dependent areas to ensure spectrum is utilized to the maximum extent possible and ensure the most suitable services available for Canadian users.

## **Section “9.6 Existing licence-exempt FSS earth stations in 3700-4200 MHz”**

### ***Q31***

*ISED is seeking comments on its proposal to issue interim authorizations for certain existing licence-exempt earth stations in the 3700-4200 MHz band.*

Ericsson’s opinion is that operations in the non-satellite dependent areas, in the long term, should be licenced terrestrial mobile services. Therefore, any licence-exempted operation should not be protected in the band 3700- 4200 MHz. This stems from keeping the long-term strategy for the band n77 (3300-4200 MHz) in view.

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## Section “9.7 Fixed service in 3700-4200 MHz”

### **Q40**

*ISED is seeking comments on its proposal to no longer issue new licences for fixed services to operate fixed point-to-point applications in the 3700-4000 MHz band.*

Ericsson supports ISED’s proposal not to issue new licences for fixed services to operate fixed point-to-point applications in the 3700-4000 MHz band as this band will be used for 5G flexible systems. In addition, it is clear that there is no demand for fixed services in this band as there are currently only two systems<sup>25</sup>.

### **Q41**

*ISED is seeking comments on whether to allow new licences for fixed services to operate fixed point-to-point applications in the 4000-4200 MHz band.*

Even though interference with FSS is unlikely<sup>26</sup>, given Ericsson views that this band is an important future band for 5G flexible usage and there is no demand for fixed services in this band, Ericsson does not support the proposal to allow new licences for fixed services to operate fixed point-to-point applications in the 4000-4200 MHz band. Some exceptions may be considered for satellite-dependent areas.

### **Q42**

*ISED is seeking comments on the proposal to grandfather existing point-to-point operations in the 3700-4000 MHz band under existing licences for fixed service (as identified in annex A), such that flexible use systems in these two tiers may not claim protection from, nor cause interference to these fixed service stations.*

*In providing comments, respondents are requested to include supporting rationale and arguments.*

Ericsson supports the proposal to grandfather existing point-to-point operation in the 3700-4000 MHz under existing licences. However, when conditions arise that flexible systems are required to deploy in the proximity, the fixed point to point systems must be vacated with reasonable notice.

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<sup>25</sup> The Consultation, section 6.2.2

<sup>26</sup> The Consultation, page 45, paragraph 155 “Although the continued operation of fixed service sites in the 4000-4200 MHz band could complicate the potential repacking/relocation of FSS operations, the likelihood is anticipated to be small since the existing fixed links and existing FSS earth stations already coexist well and have high antenna discrimination”

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**Section “10.4 Coexistence between flexible use systems and aeronautical radionavigation systems”  
Q51**

*ISED is seeking comments on its proposal to not implement any technical requirements for the coexistence between flexible use operation in the 3650-3980 MHz band and radionavigation operations in the 4200-4400 MHz band, noting the 220 MHz frequency separation between the bands of operation. If this is not sufficient for coexistence, what other measures would be appropriate?  
In providing comments, respondents are requested to provide technical analysis to substantiate such proposals.*

Ericsson believes this is a complex issue which will certainly require further studies. From “the RTCA report” provided to RABC<sup>27</sup>, it is obvious that the discussion with Cellular Telecommunications and Internet Association (CTIA) is not conclusive<sup>28</sup>. More specifically, there are several topics where RTCA “agrees to disagree with CTIA”<sup>29</sup>. It would be extremely beneficial to follow the RTCA – CTIA discussion, to understand the issues and possible resolution so that the appropriate policy can be adapted for Canada.

**Section “12. Proposed accelerated spectrum clearing approach”**

*In providing comments for the following questions, respondents are requested to include supporting arguments and rationale, taking into consideration of ecosystems for 5G services and the adjacent WBS operations in the 3650-3700 MHz band.*

**Q53**

*ISED is seeking general comments on the proposal submitted by Telesat found in annex H, including whether such an approach would be in the best interest of Canadians and more specifically, whether it would result in the faster deployment of 5G services in the affected frequencies; more efficient use of spectrum and what the implications of this repurposing plan would be for other users of the band.*

Ericsson would like to highlight the fact that Telesat’s proposal is very indicative of the possibility to clear 4000-4200, perhaps, in more than one step, in line with our view of allocation of the band from 3400-4200 MHz for mobile services.

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<sup>27</sup> [https://www.rtca.org/wp-content/uploads/2020/10/SC-239-5G-Interference-Assessment-Report\\_274-20-PMC-2073\\_accepted\\_changes.pdf](https://www.rtca.org/wp-content/uploads/2020/10/SC-239-5G-Interference-Assessment-Report_274-20-PMC-2073_accepted_changes.pdf) (“the RTCA-Report”)

<sup>28</sup> The RTCA report, page 140, “CTIA does not object to RTCA publication of the information into the public domain, but CTIA disputes the report’s analysis and conclusions.”

<sup>29</sup> The RTCA report, page 155, item 52000 to 52004 “No changes to the text at this time. SC-239 believes the characterization is accurate and in-line with FCC guidance. SC239 agrees to disagree with CTIA”.