

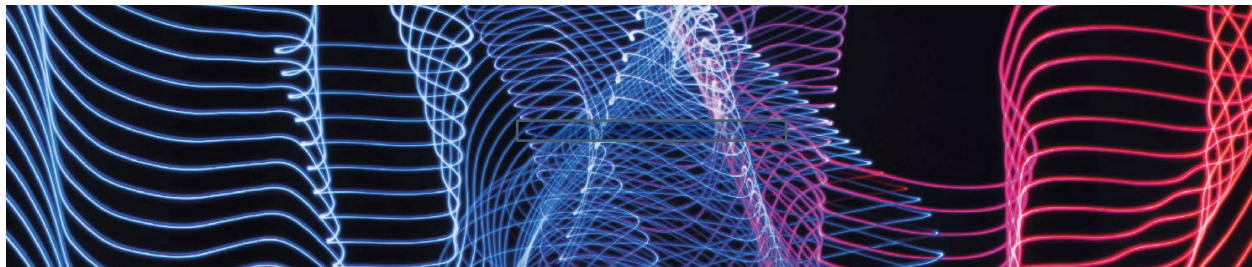
**FINAL**

**Submission to ISED  
Director, Spectrum Licensing Policy Branch**

**Regarding 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**

***Date of this Version:  
October 25<sup>th</sup>, 2020***



***Mobilexchange Ltd***

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## 1.0 Introduction

***Our recommendations are submitted to ISED in accordance with instructions contained in the Canada Gazette, Part I, Volume 154, Number 37 dated September 12th, 2020 relating to the RADIOCOMMUNICATION ACT 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.***

As a veteran of the Canadian telecommunications industry, and now an independent, with no business association with any telecom service provider or regulatory body, I welcome the opportunity to address the Clarification and questions process for 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.

Our recommendations in relations to the questions and clarifications addressed here concern the spectrum allocation for present planning and future deployment of the Public Safety Broadband Network (PSBN).

Submission to ISED at:     [ic.spectrumbauctions-encheresduspectre.ic@canada.ca](mailto:ic.spectrumbauctions-encheresduspectre.ic@canada.ca)

Respectfully submitted by

**Michael Kedar,**  
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### *Acknowledgements*

*Mobilexchange Limited would like to acknowledge the participation of Mr. Phil Crnko (Black Castle Networks) and Mr. Mike Dixon of PSBN Consulting in the preparation of this document.*

## 2.0 Background

1-In most developed nations, including Canada, most of the population lives in urban and suburban areas, which take up a small percentage of the landmass. A much smaller number of people live in very rural and remote areas, these remote areas represent a large proportion of the country's landmass.

2-According to the CRTC's Communication Monitoring Report, 4G/LTE mobile coverage is available to 98% of the population in Ontario, and that is achieved by providing terrestrial wireless mobile coverage to around 20% of the land area of the province, unfortunately the Ontario Provincial Police, multiple Indigenous Public Safety Agencies and social services in general, require much broader mobile coverage (perhaps as much as 50%-60% of the land area. **The Digital Divide for broadband for social services is therefore very real!**

3-In our submission "***CRTC Consultation 2019-406-1 – Barriers to Rural Broadband Deployments (enclosed)***", of April 22<sup>nd</sup> 2020, we expended on the recommendations to accomplish the dual goal of improving Public Safety as well as contributing to the ISED goal of High-Speed Access for All, particularly in **rural and remote Canada**. We respectfully propose that this submission<sup>1</sup> (see footnote 1) forms part of this proceedings.

4-In the various rural broadband funding programs the Canadian Governments have reiterated the 6 fundamental "pillars" of Rural Broadband services:

- Economic development
- Public health - Telehealth
- Work from home – Teleworking
- Study from home -Teleworking
- Emergencies and responses – Public Safety
- Access and wellbeing – Utilities and Roads

5- As stated in the **Auditor General 2018 Fall Reports**<sup>2</sup> - "Connectivity in Rural and Remote Areas", (see footnote 2) section 1.61:

"We found that small Internet service providers struggled to acquire high-quality spectrum to improve broadband deployment in rural and remote areas. For example, Innovation, Science and Economic Development Canada (the Department) auctioned spectrum licenses for geographic areas that were too large for smaller service providers to submit bids for. The secondary market for unused spectrum did not function well, partly because licensees had little business incentive to make unused spectrum available for subordinate licensing. In addition, the information on unused spectrum was not readily available to interested Internet service providers."

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<sup>1</sup> [Mobilexchange Submission](#)

<sup>2</sup> [Connectivity in Rural and Remote Regions](#)

6-The lack of access availability for PSBN (Public Safety Broadband Networks) to wireless broadband networks in rural and remote areas put Canadians at risk, as they are:

**Unable while away from fixed internet access to call 911 wirelessly and, the First Responders arriving at an emergency, are deprived of broadband wireless access -a key necessity for mission critical rescue activities.**

7- We strongly support the Telesat proposal (Anne X H: Telesat proposal) as it will greatly advance 5G deployment in urban and suburban areas of Canada as well as provide a great opportunity for closing the rural divide and providing connectivity for social services and public services in remote areas of the country.

8- We support **Telesat** as stated in their proposal:

“Telesat believes that there is an opportunity for Canada to accelerate the re-purposing of the 3800 MHz band, to make more spectrum available to Canadian wireless operators on a shorter timeline than has been set out by the FCC in the U.S. This would enable more Canadian wireless service providers to have access to enough critical mid-band spectrum to enable sustainable competition in optimum 5G services. Moreover, it would enable them to deploy these services years sooner than would otherwise be possible. Importantly, all of this can be accomplished with no loss of critical services to existing 3800 MHz users in Canada, provided that sufficient investment is made in new facilities to which such users can be transitioned.”

***(excerpt from Telesat’s proposal)***

9-Canada has deployed some mid-band spectrum (from 3475 MHz to 3650 MHz) for many years in a fixed broadband model (4G/LTE) but this spectrum will be re-farmed with “flexible” licenses in mid-2021 in a configuration better suited to the 5G air interface with the optional choice of mobile and/or fixed wireless use cases.

10-The current Consultation (SLPB-02-20) goes even further and suggests re-farming spectrum from 3650-4300 MHz for 5G purposes and moves away from dedicated C-Band Satellite services.

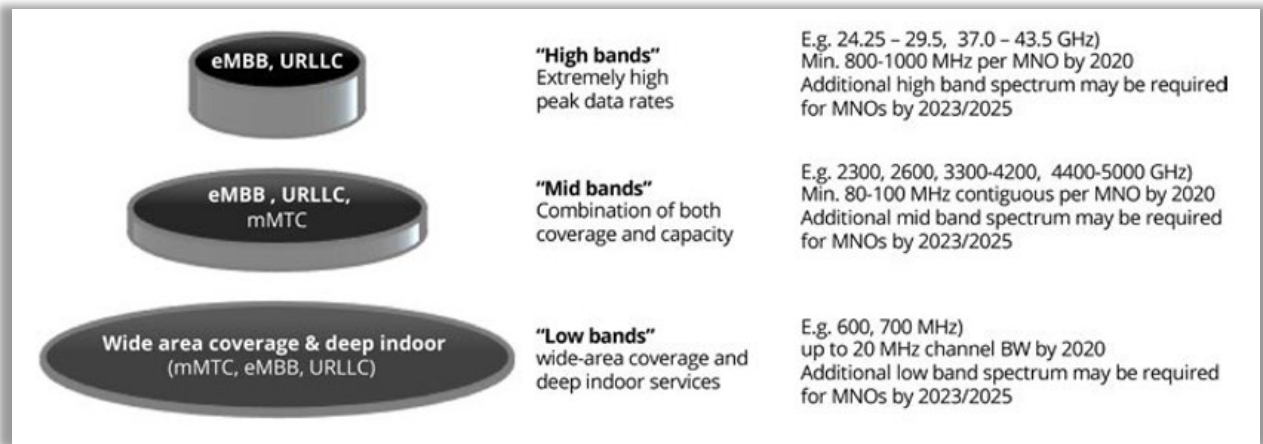


Figure 1 plans for 5G NR Bands

**11-**The governing body for cellular broadband systems ("3GPP") has also defined a new radio air-interface for ("NR") for 5G but in an unusual move has defined a concept called Dynamic Spectrum Sharing ("DSS") whereby low-band channels can support both 4G/LTE and 5G air interface protocols (although in different time-slots). This feature means that a Mobile Network Operator ("MNO") could support today's 4G devices as well as new 5G NR capable devices (**providing the base station equipment comes from the same vendor**). This transition will mean that some Canadian MNO's may need to upgrade existing 4G/LTE Base Stations to new models capable of supporting both the 4G and 5G air-interfaces.

**12-**To be able to provide 5G NR in Canada our MNOs will be upgrading their networks over the next 2 to 5 years to be able to market these new features and higher broadband capacities.

**13-**5G NR in the 3300–4200 MHz frequency band will facilitate a consistent user experience ranging from high capacity and high density (up to 3–5 Gbit/s peak throughput in the case of a 100 MHz channel bandwidth) to wider coverage, to also address suburban areas and small towns without requiring extra site densification compared to current deployments.

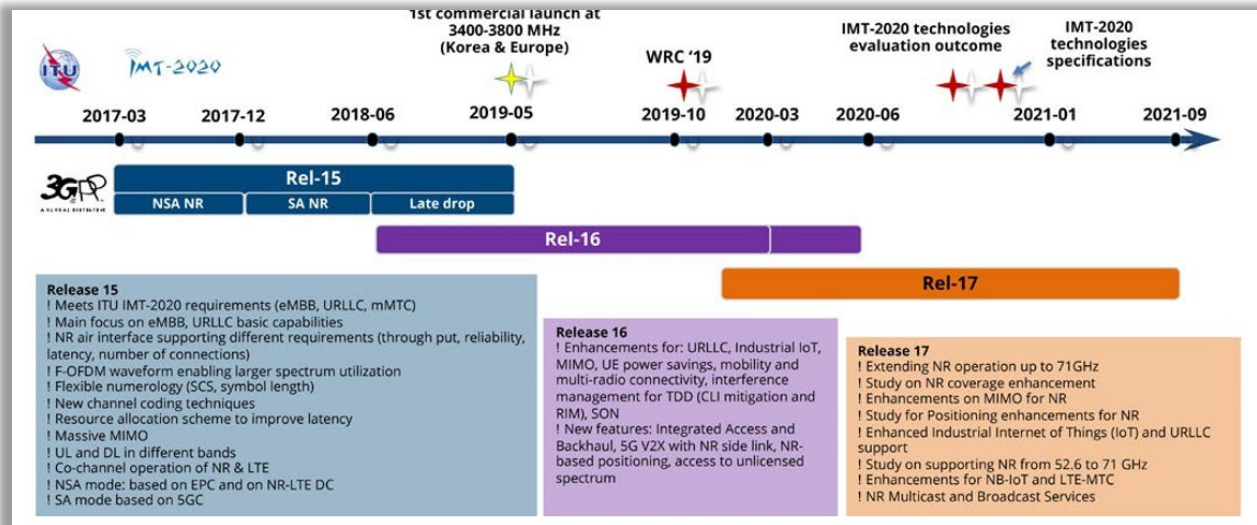


Figure 2 3GPP Roadmap for 5G NR (2017-2021)

All the major equipment vendors (Ericsson, Samsung and Nokia) will participate in the arrival of 5G in Canada in 2021 and 2022.

14-Public Safety Canada established a Temporary Nation Coordinating Office<sup>3</sup> (TNCO) to provide a baseline for the Public Safety Broadband Network and under the essential principals established by TNCO in it 2019 report is the Sustainability Principle which outline the following requirements:

15-The PSBN must be delivered by means that ensure ecological integrity is maintained, resources required to maintain its future integrity are available and the future needs of stakeholders are attainable, served and respected.

- *Intrinsic in this are the needs for ongoing maintenance, to evolve, staying current with changing technology and standards and the need for suppliers of goods and services to the PSBN to be sustainable well into the future.*

- *The PSBN will, at a minimum, have the equivalent to commercial broadband coverage and should establish or enhance broadband coverage in underserved urban, rural, indigenous and remote areas and communities.*

16-The GSMA has concluded worldwide that 5G will need three key frequency ranges to deliver widespread coverage and support all use cases.

17-The three ranges are known as Low Band, Mid-Band and High Band (or millimeter wave), as shown earlier in figure 1.

<sup>3</sup> [Temporary National Coordinating Office](#)



18-The fundamental question in this submission is:

**How can the PSBN meet the Sustainability Principle as defined by TNCO, if its spectrum allocation is restricted solely to the 700 MHz band?**

19- To resolve this fundamental question we respectfully recommend that access to licensed spectrum in the mid band (3560-4200 MHz) will be mandated for Public Safety and other tax payers funded Social Services via **mandated spectrum license conditions**.

20- Rather than allocating a portion of the mid band for Public Safety the way the Band 14, 20 MHz have been assigned to the PSBN, we believe that mandated access provisions in form of license conditions (both to primary and secondary licensing) would effectively provide a solution.

21- Here are specifically our recommendations for the mid band mandated license conditions:

21-1 - In licensed areas where the licensee has no deployment, within 2 years:  
**PSBN will be sub-licensed at no fee to provide PSBN connectivity**

21-2 - In areas where a licensee is the only deployer in this spectrum (single MNO), **PSBN will be allowed to deploy under a secondary license, in coordination with the licensee, to increase network resiliency to Public Safety QoS standards.**

21-3 - In all deployed areas in accordance with the mid band licenses, **a mandated roaming and priority provision in the licenses, for PSBN, will be enforced. Where two or more MNOs are deployed in this band and PSBN identifies “dead zones” PSBN operators will be allowed to deploy,**

### 3.0 Our Response to Questions contained in SLPB-002-20

#### 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.

#### Response 1:

Network equipment, smartphones, customer premises equipment and other types of end-user equipment utilizing 5G-NR are now available in various markets in different spectrum bands, all of which add support for 5G in various parts of the 3300–4200 MHz range, if not the entire range – that is, for 3GPP bands n77 (3300–4200 MHz) and n78 (3300–3800 MHz).

As of Q1, 2020 there are nearly 140 operators currently investing in 5G networks in the 3300–4200 MHz range globally: 43 of them are deploying, have deployed, or have launched 5G networks using this spectrum. This ensures that the necessary building blocks (chipsets, devices and base stations) are, or will be available for North American markets. All of the Canadian carriers seem to follow the technology paths chosen by AT&T and the devices will likely support 5G in this band and also support the 4G/LTE and 5G air-interface in the 700 MHz (and other) low bands.

#### 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.

#### Response 2:

Band n77 (3300-4200) includes Band n78 (3300-3800) which allows chipset manufacturers to support the whole of Band n77. We should not have to choose between these bands.

### 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.

### Response 3:

Canada should generally align its rules with the USA, since the Canadian market for smartphones, tablets and IoT devices is regarded as "too small" for many vendors. Once US carriers agree to carry devices they can be easily approved for sale in Canada. There is more flexibility with Customer Premise Equipment since these form factors allow "more customization".

As an example, the US National Institute of Standards and Technology provides a list of certified devices<sup>4</sup> for the FirstNet/AT&T Public Safety System which includes devices with 4G/LTE Band 14 support. Band 14 is not yet available in Canada.

### 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 of SLPB-002-02.

### Response 4:

Agreed.

### Q5

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

### Response 5:

A flexible use licensing model should be used, as long as it provides for either fixed-use or mobile-use on an exclusive license basis. Licenses should not be "shared" or "first come first served" as in the current WBS licenses.

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<sup>4</sup> [NIST Public Safety Devices](#)

## **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 licenses be limited to the 4000-4200 MHz band.

### **Response 6:**

Agreed.

## **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.

### **Response 7:**

Agreed, Canada should align with the US proposals of a 20MHz Guard Band between 3980-4000 MHz.

## **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.

### **Response 8:**

Not Agreed. Flexible use operations (meaning mobile and fixed terrestrial services) should have the primary allocation from 3700-3980 MHz, FSS should retain a primary allocation in the 4000-4200 MHz Band.

### **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.

### **Response 9:**

The Telesat re-banding proposal supports option (c) and is preferred.

**Q10**

In addition to capacity requirements, ISED is seeking comments on other issues that should be considered in maintaining broadband connectivity in satellite-dependent areas.

**Response 10:**

The Telesat re-banding proposal supports option 9 (c) and is preferred.

**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 of SLPB-002-20. In addition, ISED is seeking comments on the proposed grandfathering of the existing earth station operations listed in annex C of SLPB-002-20, 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.

**Response 11:**

Agreed. Remove the FSS allocation in the 3500-3650 MHz band. The proposed grandfathering of the existing earth station operations listed in annex C of SLPB-002-20, 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 is sub-optimal and should not be considered.

**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 of SLPB-002-20.

**Response 12:**

Agreed. Remove the FSS allocation in the 3500-3650 MHz band and suppress the footnote.

**Q13**

ISED is seeking comments on:

- a) establishing unpaired blocks of 10 MHz for the 3650-3700 MHz band
- b) establishing unpaired blocks of 10 MHz for the 3700-3980 MHz band

**Response 13:**

Agreed. Both (a) and (b) are fine as long as eventual flexible use licenses are allocated in large contiguous allocations to obtain the “best” 5G channel performance. and in full coordination with FCC allocations.

**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).

**Response 14:**

Not Agreed. In the large Metropolitan Areas (Vancouver, Toronto and Montreal) any shared licensing process should be avoided and NO priority given to existing WBS licensees.

**Q15**

Given the proposal to implement Option 2, ISED is seeking information on potential costs such as upgrading equipment, which may be incurred by WISPs that are displaced from 3650-3700 MHz to provide services using the 3900-3980 MHz band.

**Response 15**

Not relevant to Public Safety. Do not provide “shared licensing” in the Metropolitan Areas of Vancouver, Toronto and Montreal.

**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.

**Response 16**

All WBS operations in urban, metropolitan areas should be displaced by December 2023.

**Q17**

ISED is seeking comments on the Tier 4 service areas that would be considered urban as defined above and as listed in annex D of SLPB-002-20.

**Response 17**

Not Agreed. The focus for ISED should be on the Metropolitan Areas of Vancouver, Toronto and Montreal as defined in **DGSO-006-19**<sup>5</sup>(Decisions on a new set of Service Areas for Spectrum Licensing).

**Q18**

ISED is seeking comments on whether the moratorium should be extended to include all Tier 4 service areas.

**Response 18**

Not Agreed. The focus for ISED should be on the Metropolitan Areas of Vancouver, Toronto and Montreal as defined in **DGSO-006-19** (Decisions on a new set of Service Areas for Spectrum Licensing).

**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)

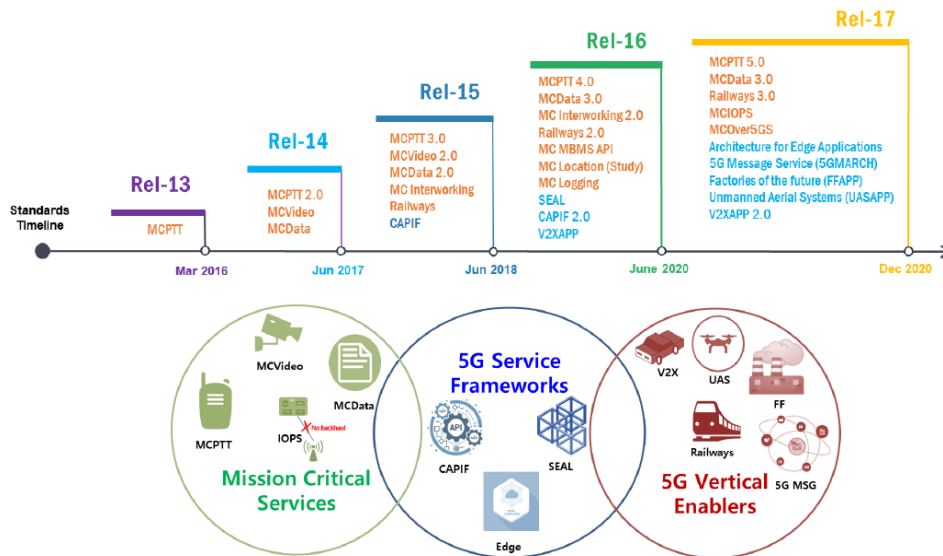
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<sup>5</sup> [DGSO-006-19 Decision on New Service Areas](#)

- 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

**Response 19:**

- a) **what type of applications are envisioned for this spectrum?**



3GPP has already identified major network changes as we move from 4G/LTE to 5G networks that will enable many new mobile applications to be developed. Mission Critical Services are of prime interest to the Public Safety Community together with the introduction of Mobile-Access Edge Computing (“MEC”).

MEC will see the co-location of Cloud Computing services at the mobile network edge that will enable many “use cases” such as vehicle-to-vehicle (“V2X”) communications, drones, Internet of Things and AR/VR applications that depend on millisecond response times. In other words this will enable “Smart Cities” of the future.

- b) **what type of shared licensing process ISED should consider (e.g. database approach, licensee to licensee coordination)**

Our suggestion is that for the major metropolitan centres (Vancouver, Toronto and Montreal) dedicated licenses are allocated to the public sector agencies. Canada should avoid the CBRS Spectrum Access Systems approach that was designed by the FCC to solely to protect US marine radar applications. That approach has no traction internationally.

- c) **what additional measures ISED should consider employing to manage access to the band in high demand areas, such as major metropolitan centres**

See (b) above.

- 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.)***

Any licensing approach should allow use of smartphones (200mW) for mobile use, as well as higher-powered Customer Premise Equipment (both indoor and outdoor) for fixed wireless use.

- e) *what type of eligibility criteria, if any, should be established***

No comment.

**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.

**Response 20:**

Agreed.

**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 of SLPB-002-20, 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).

**Response 21:**

No comment.

**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.

**Response 22:**

Agreed.

**Q23**

ISED is seeking comments on its proposal to modify the existing FSS satellite authorizations to limit FSS operations in 3700-4000 MHz in non-satellite-dependent areas of Canada to a no-interference basis.

ISED is also seeking comments on the proposal to adjust the conditions of licence for FSS operations to reflect the proposals as of the FSS transition deadline, including the possible removal of a high expectation of renewal for the 3700-4000 MHz portion of the band.



**Response 23:**

The whole point of re-banding C-Band satellite operations is to make that spectrum available for mobile and fixed wireless deployments. The Telesat LEO proposal will be able to provide backhaul facilities to areas where other options (like fibre) are not economically viable. There should be no expectation of license renewal for FSS in the 3700-4000 MHz band.

**Q24**

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

**Response 24:**

The sooner the better!

**Q25**

ISED is seeking comments on how the U.S. transition will impact the availability of FSS capacity in Canada.

**Response 25:**

No comment.

**Q26**

ISED is requesting information to assist with the consequent decision following this consultation. This information includes satellite transponder migration plans, frequencies, and how satellite operators serving the Canadian market will accommodate all Canadian customers, and on which frequencies. Requested information could include, but is not limited to:

the names and number of satellites that will need to migrate to the 4000-4200 MHz band

- the number of new satellites that may be required to serve the Canadian market
- the locations of earth stations communicating with these satellites
- the number of antennas and locations of associated earth stations that will need to be retuned and/or repointed
- the flexibility of existing satellites to modify operations according to the different areas of Canada

**Response 26:**

No comment -best leave it to Telesat to assist ISED!

**Q27**

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

**Response 27:**

The deadline of December 2023 is definitely required.

**Q28**

ISED is seeking comments on making amendments to the relevant conditions of licence and technical rules in the 3700-4200 MHz band as well as the 3450-3700 MHz band in order to implement the following proposals with respect to protection from interference:

a) prior to the transition deadline, existing licensed FSS earth stations may operate in the entire 3700-4200 MHz band in all areas and be protected from interference from flexible use operations both in-band (3700-3980 MHz) and the adjacent 3450-3700 MHz band

b) after the transition deadline, existing licensed FSS earth stations may continue to operate in the entire 3700-4200 MHz band in satellite dependent areas and be protected from interference from in-band flexible use operations in 3700-3980 MHz, but would not be protected from flexible use operations in the adjacent 3450-3700 MHz band; however, ISED also proposes that flexible use licensees deploying stations in the 3450-3700 MHz band within 25 km of an existing licensed FSS earth station in the 3700-4200 MHz band be required to provide a notification to these operators, one year prior to the deployment of fixed or mobile stations

c) after the transition deadline, FSS earth stations would only be licensed to operate in the 4000-4200 MHz band in non-satellite -dependent areas and would be protected from flexible use operations in the adjacent 3700-3980 MHz band

d) after the transition deadline, FSS earth stations operating in 3700-4000 MHz, in all areas, which are not eligible for licensing could continue to operate as a licence-exempt station without protection from flexible use operations both in-band and adjacent band(s)

**Response 28:**

No comment.

**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 of SLPB-002-20.

**Response 29:**

No comment.

**Q30**

ISED is seeking comments on how to ensure the continued operation of gateways that support the provision of services in satellite-dependent areas, specifically:

a) how much spectrum would be required at these gateway sites

b) if these stations could be consolidated into two sites, away from major population centres, and where the best locations for those sites would be.

**Response 30:**

Gateways should be at least 100km from any major urban areas. Geo-redundancy should be considered.

**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.

**Response 31:**

No comment.

**Q32**

ISED is seeking comments on the proposed deadline of up to 90 days after the publication of a decision for submitting applications for these interim authorizations of existing licence-exempt FSS earth stations in the 3700-4200 MHz band.

**Response 32:**

No comment.

**Q33**

ISED is seeking comments on its proposal that receive-only earth stations that are not eligible for an interim authorization or whose operators do not seek authorization, could continue to operate as a licence-exempt earth station on a no-protection basis.

**Response 33:**

Not a good idea!

**Q34**

ISED is seeking comments on its proposal that in non-satellite-dependent areas, existing earth stations that operate under interim authorizations receive in-band protection from flexible use operations in the 3700-3980 MHz band until the transition deadline.

**Response 34:**

Not a good idea!

**Q35**

ISED is seeking comments on its proposal that in satellite-dependent areas, existing earth stations that operate under an interim authorization receive in-band protection from flexible use operations in the 3700-3980 MHz band before and after the transition deadline.

**Response 35:**

No comment.

**Q36**

ISED is seeking comments on its proposal that in all areas, existing licence-exempt earth stations that operate under an interim authorization receive no protection from adjacent band WBS stations and flexible use stations operating below 3700 MHz before and after the transition deadline.

**Response 36:**

WBS spectrum from 3650-3700 MHz needs to become licensed for flexible use (and NOT on any shared basis).

**Q37**

ISED is seeking comments on whether the interim authorization process should also apply to new receive-only FSS earth stations in the 4000-4200 MHz band.

**Response 37:**

No comment.

**Q38**

ISED is seeking comments on the proposed conditions for interim authorizations for licence-exempt FSS earth stations in 3700-4200 MHz and new receive-only FSS earth stations in the 4000-4200 MHz portion of the band as detailed in annex G of SLPB-002-20.

**Response 38:**

No comment.

**Q39**

ISED is seeking comments on the proposed eligibility of licence-exempt stations that could apply for an interim authorization.

**Response 39:**

No comment.

**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.

**Response 40:**

Agreed – no new fixed services should be licensed to operate fixed point-to-point applications in the 3700-4000 MHz band

**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.

**Response 41:**

Not Agreed. The focus for 4000-4200 MHz band is for satellite operations.

**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 of SLPB-002-20), such that flexible use systems in these two tiers may not claim protection from, nor cause interference to these fixed service stations.

**Response 42:**

Not Agreed. Relocate the point-to-point services.

**Q43**

ISED is seeking comments on the proposal to rely on technical limits and coordination procedures rather than mandate specific technology solutions (e.g. TDD synchronization between systems) to address interference issues between TDD flexible use systems in the 3650-3980 MHz band.

**Response 43:**

Agreed. We should rely on technical limits and coordination procedures rather than TDD synchronization.

**Q44**

ISED is seeking comments on whether any additional measures should be taken to limit potential interference issues between flexible use systems in the 3650-3980 MHz band.

**Response 44:**

No comment.

**Q45**

ISED is seeking comments on whether specific technical measures should be adopted to address potential interference issues between flexible use systems and WBS systems until the displacement deadline.

a) For co-channel flexible use and WBS operations in the 3650-3700 MHz band, what specific measures may be needed to protect WBS? For example, should new flexible use stations be required to coordinate with WBS stations within a specified distance prior to deployment? Alternatively, should a technical parameter such as a power flux density (pfd) trigger for coordination measured at the WBS receive antenna be adopted? Are there other more appropriate measures that ISED should consider? Should multiple measures, such as a combination of distance and pfd trigger for coordination, be adopted? How would these requirements impact the deployment of new flexible use stations?

b) For adjacent band flexible use systems, is there a need to adopt any additional measures, beyond what is currently specified in RSS-192 and SRSP-520, to further address coexistence between these flexible-use and WBS systems? If so, what should they be? How many flexible use frequency blocks (or MHz) immediately adjacent to the 3650-3700MHz band could potentially affect WBS systems? How would these requirements impact the deployment of flexible use stations?

**Response 45:**

In major metropolitan areas current WBS systems represent a barrier to the deployment of 5G in the 3650-3700 MHz spectrum. Perhaps an earlier deadline than the end of December 2023 is in order?

**Adjacent band****Q46**

Until the transition deadline, in all areas for flexible use in the 3650-3700 MHz band: ISED is seeking comments on the proposal that until the transition deadline, those flexible use licensees deploying stations in 3650-3700 MHz within 25 km of a licensed FSS earth station (not including interim FSS authorization) in the 3700-4200 MHz band will be required to coordinate with the operators in these earth stations.

**Response 46:**

In major metropolitan areas current WBS systems represent a barrier to the deployment of 5G in the 3650-3700 MHz spectrum. Perhaps an earlier deadline than the end of December 2023 is in order?

**Q47**

After the transition deadline , in all areas for flexible use in the 3450-3650 MHz band: ISED is seeking comments on its proposal that the current SRSP-520 coexistence requirements for flexible use operations in the 3450-3650 MHz band to protect FSS operations in the adjacent band 3700-4200 MHz be removed.

**Response 47:**

Agreed.

**Q48**

**For FSS earth stations licensed in the 4000-4200 MHz band and flexible use in the 3800 MHz band, in all areas:**

ISED is seeking comments on adjacent band coexistence measures, taking into account the coexistence measures adopted by the EU (i.e. a stringent OOB limit) and the U.S. (i.e. a combination of guard band, a typical OOB limit, pfd limits, and baseline minimum filter specifications for earth station operations) and the current Canadian requirements (i.e. a typical OOB limit and coordination distance):

- a) What are the benefits and technical limitations associated with the above coexistence measures?
- b) Which set of coexistence measures above (i.e. EU, U.S., Canada) is preferred? If applicable, comments are sought on the values of the limits in relation to the supported measures.
- c) Given the proposal in section 9.1 to displace WBS in 3650-3700 MHz and identify 3900-3980 MHz for shared use, are there any additional considerations that may impact the response to a) and b) above?
- d) Which portion of the 3800 MHz band should the above measures be applied to in order to protect FSS in the 4000-4200 MHz band (i.e. how many frequency blocks or MHz)?

**Response 49:**

Since the North American market for base stations, mobile devices and CPE is determined by American carriers, we recommend following the US coexistence measures.

**Co-channel**

**Q49**

ISED is seeking comments on what technical requirements should be imposed to ensure co-channel protection of FSS earth stations from flexible use systems, in the relevant scenarios and timeline as stated in sections 9.5 and 9.6. For example, could the pfd limit of -124 dBW/m2/MHz measured at the earth station antenna proposed by FCC above be used to protect co-channel FSS earth station? Alternatively, should other measures be adopted, such as a separation distance as described in section 7.3? Or should a combination of measures be adopted? If applicable, what are the specific values that should be adopted?

**Response 49:**

Canada should follow the FCC rules.

## **Earth station technical parameters**

### **Q50**

ISED is seeking comments on whether the assumptions made by the FCC about earth stations, including baseline minimum filter specifications for earth station operations as stated above, are applicable to Canadian operations. Is there any additional information that ISED should consider in the development of appropriate technical rules to enable coexistence both co- channel and in adjacent bands?

### **Response 50:**

Canada should follow the FCC rules.

### **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 radio navigation 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?

### **Response 51:**

Agreed. Radio navigation operations should not be affected given the 220 MHz separation.

### **Q52**

ISED is seeking comments on the use of an auction as the licensing process for the flexible use spectrum that would be considered as the 3800 MHz band, noting a separate consultation process would be issued, if required, to determine the licensing framework for the range 3900- 3980 MHz.

### **Response 52:**

Agreed. An auction process for commercial spectrum will be required.

### **Q53**

ISED is seeking general comments on the proposal submitted by Telesat found in annex H of SLPB-002-20, 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

### **Response 53:**

We believe that the Telesat proposal would be in the best interest of Canadians and would result in the faster deployment of 5G services in the affected frequencies. Since Telesat will be focused on the outcome (rather than the process) and determined to get the Telesat LEO satellites deployed on time and on budget!

### **Q54**

ISED is seeking comments on whether the Telesat proposal meets ISED's policy objectives outlined in section 3, including:

- a) supporting rural/remote connectivity
- b) promoting competition in mobile services
- c) making more mid-band spectrum available to support 5G services

**Response 54:**

We believe that the Telesat proposal meets and enforces ISED's policy objectives and will support rural/remote connectivity as well as promoting competition in mobile services and make more mid-band spectrum available to support 5G services

**Q55**

ISED is seeking comments on what elements from sections 7 to 10 of this consultation would still apply or need to change if ISED were to implement the Telesat proposal, in particular:

- a) the proposal for maintaining the primary allocation for FSS in the 3700-4200 MHz band
- b) the proposed implementation of an exemption to transition for satellite-dependent communities and the proposed changes to satellite licenses to apply it
- c) the proposal for treatment of WBS incumbents
- d) the proposal to issue interim authorizations for certain existing licence-exempt earth stations in the 3700-4200 MHz band
- e) technical considerations for coexistence between FSS and flexible use
- f) technical considerations for coexistence between FSS and aeronautical radionavigation systems
- g) the overall impact on existing users in the 3700-4200 MHz band

**Response 55:**

We support Telesat's proposal, these issues are best addressed by Telesat.

**Q56**

If ISED were to implement the Telesat proposal, ISED would need to consider the licensing framework for the 3700-3900 MHz band. Thus, ISED is seeking comments on:

- a) whether it should, as proposed by Telesat, issue flexible licences in the 3700-3900 MHz band using the same conditions of licence as those contained in annex H of the 3500 MHz Framework, noting that some conditions may need to be adjusted to reflect the differences in the two bands and the decisions resulting from this consultation process
- b) whether it should issue a single Tier 1 flexible use licence as proposed by Telesat or align with the 3500 MHz band and issue Tier 4 licences
- c) what deployment conditions should apply to these licences including Telesat's proposal that the deployment requirements would only come into force after the Minister approves a transfer
- d) any additional conditions of licence that should apply given the nature of the proposal

**Response 56:**

We support Telesat's proposal, these issues are best addressed by Telesat.

**Q57**

In its proposal, Telesat indicates that it takes no position on ISED imposing a pro-competitive measure such as a spectrum cap or set-aside on the 3700-3900 MHz licences. ISED would review any request for transfer in accordance with provisions related to commercial mobile spectrum through section 5.6 of CPC-2-1-23, Licensing Procedure for Spectrum Licences for Terrestrial Services. However, ISED would also consider the competitive implications on the 3500 MHz and 3800 MHz bands and consider pro-competitive measures in accordance with the Framework for Spectrum Auctions in Canada. As such, ISED is seeking comments on:



- a) the need for a pro-competitive measure (e.g. spectrum cap or set-aside)
- b) the type of competitive measure that should be applied
- c) the amount of spectrum that should be considered under any such competitive measure

**Response 57:**

We support Telesat's proposal, these issues are best addressed by Telesat.

**Q58**

ISED is seeking comments on Telesat's proposals for the transition of FSS earth stations and whether any additional measures are required to ensure a smooth transition.

**Response 58:**

We support Telesat's proposal, these issues are best addressed by Telesat.

**Q59**

Telesat's proposal includes ISED allocating an additional 80 MHz for flexible use in the 4000- 4100 MHz band. ISED is seeking comments on the feasibility of making this extra spectrum available, specifically:

- a) whether there would be standardized 5G equipment available for this 80 MHz, given that it does not align with the U.S. band plan
- b) whether there would be FSS filters available, given the reduced amount of FSS spectrum and that it would not align with the U.S. band plan
- c) whether there would be enough capacity to continue FSS services in Canada with the proposal to reduce the amount of FSS spectrum to 100 MHz
- d) to what degree would the requirement to protect U.S. FSS earth stations in the border areas have an impact on the ability to deploy flexible use stations near the border and to what degree would this impact the value of this spectrum.

**Response 59:**

We support Telesat's proposal, these issues are best addressed by Telesat, but this 80 MHz is still included in the 3GPP 5G Band Plan.

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