Canadian Association of Wireless Internet Service Providers (CanWISP)

Consultation Letter – *Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band*

SLPB-002-20 Dated August 2020

October 26, 2020

Executive Summary

1. In August 2020, the Department issued a consultation letter titled *"Comments on Consultation Letter – Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band"* ("the Consultation Letter"). In the Consultation Letter, the department has initiated a consultation on the technical and policy framework for the 3650-4200 MHz band (referred to as the 3800 MHz band) to accommodate flexible use for fixed and mobile services. Proposed changes to the 3500-3650 MHz frequency allocation related to the status of fixed satellite service in the Canadian Table of Frequency Allocations (CTFA) are also included in this consultation. This letter also announced moratoria on certain licensing processes. The Department has invited interested parties to submit comments regarding these proposals.
2. Canadian Association of Wireless Internet Service Providers. ("CanWISP") hereby files the following comments in response to the Consultation Letter. This document summarizes CanWISP's holistic view for management and licensing of the mid-band spectrum. CanWISP's answers to the 59 questions are contained in Annex 1.
3. CanWISP evaluates the 2 ISED options in light of the following considerations (as shown in fig. 1 below):

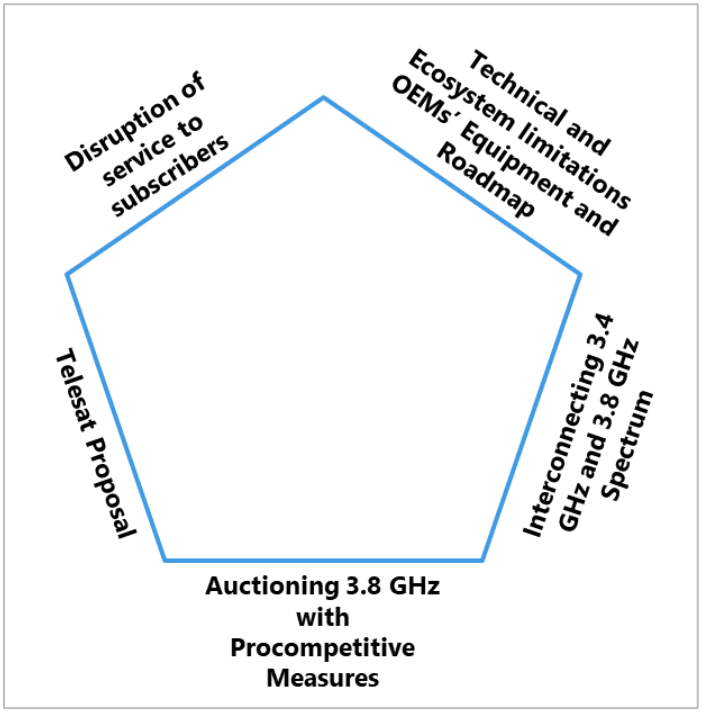

Figure 1. Proposal Sections

Option 1 is the most feasible option for CanWISP members as we believe that it will suit the best interest of WISPs, carriers, TELESAT and ISED's goals. The two options are depicted below in Fig. 2.

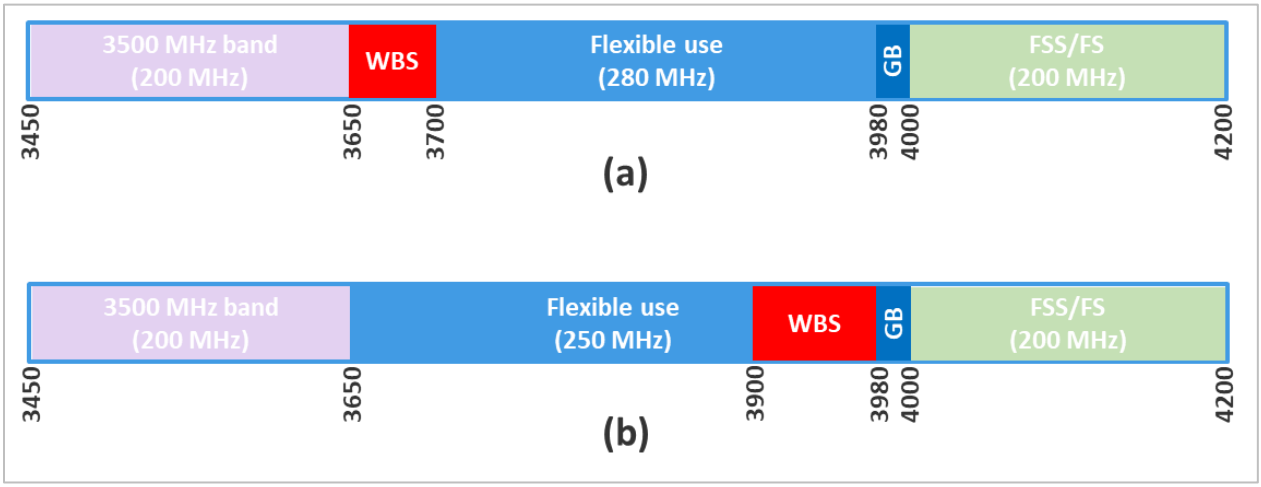

Figure 2. (a) Scenario 1: No displacement with ISED proposal for 3700 – 4000 MHz (b) Scenario 2: Displacement with an adoption of ISED proposal for 3700 – 4000 MHz

Option 1: Staying in WBS Band

In this option, CanWISP is recommending the following:

4. All WBS licensees, to stay in the same band 3650 MHz – 3700 MHz. This means no mortarium is needed for any future deployment for current licensees excluding MNOs.
5. CanWISP suggests an approach similar to that employed by best practice regulators such as Ofcom (UK), for management of shared protected licenses. Under this approach, ISED would play a central role in funding a central database with a detailed predefined matrix of parameters and qualifying applicants. These parameters would be communicated to licensees in the particular licence area so when implemented, an initial preapproval is granted. In the case that licence is rejected, ISED would intervene with a predefined procedure to decide on the deployment (*Ofcom Shared Access License – Guidance Document*: https://www.ofcom.org.uk/__data/assets/pdf_file/0035/157886/shared-access-licence-guidance.pdf).
6. CanWISP recommends that ISED devolve the coordination of deployment to a specially constituted committee - such as that currently constituted under FSCA. Alternatively, CIRA could be considered as a coordinating body.

7. Coordination activities would ensure safe separation distance & power output. The committee would consult with the OEMs to ensure the solutions were tailored to the specific deployments. Funding for the committee's technical coordination activities would be funded from ISED and/or new licensees.
8. Under this scenario for Option 1, there will be no impact on the continuity and quality of CanWISP's services to their customers. This stability would ensure continuity of the resources and investments for the design, implementation and delivery of new services are maintained.
9. WISPs with their technology partners and suppliers, will continue to deliver premium service utilizing 4G technologies on this shared band as FWA. Current gear that covers the 3650-3700 band would also cover both exclusive bands: 3450 – 3650 MHZ and 3700 – 3900 MHz and thus, would not require WISPs to incur any extra costs - other than SW licences.
10. CanWISP views bands 3.5 GHz, 3450 – 3650 MHz, and 3.8, 3700 – 4000 MHz, as interconnected bands necessary to stimulate the economy, introduce 5G services and bridge the digital gap by delivering 50/10 Mbps everywhere across Canada.
11. Given the expected high demand for spectrum by both MNOs and WISPs, CanWISP proposes the following:
    a. Both the 3.5 GHz and the 3.8 GHz bands be auctioned with a 50% set-aside;
    b. that Tier 5 licensing be introduced as an additional procompetitive measure in the 3.8GHz auction;
    c. CanWISP proposes that the 3.8 GHz spectrum to be auctioned no later than June 2022.
12. While a 40% set-aside has been indicated for the 3.5 GHz auction, CanWISP recommends a set-aside of 50% i.e. 140 MHz out of 280 MHz in the 3700 – 3980 MHz band.
13. These pro-competitive measures would enable new entrants including WISPs, to bring competition into the mobility market and provider subscribers with choice in services and service providers for rural subscribers.

Option 2: Displacing WBS Licensees

In the eventuality that ISED adopts option 2, CanWISP is recommending the following measures:

14. All WBS licensees to migrate to the band 3900 – 3980 MHz.
15. WBS licensees continue to operate in the 3650-3700 band pending the availability of secure spectrum and a commercial ecosystem in the 3900-3980MHz band.

16. Allow WISPs to access the 3400-3450 MHz block to enable concurrent operation of existing equipment while migrating to the new band. This will allow the WISPs that have the gear that can operate this band to transition the operations there and clear 3650 – 3700 MHz while waiting for the ecosystem to be ready for 3900 – 3980 MHz band. This will allow the services to continue without disruption. After the displacement process to 3900 – 3980 MHz is complete, CanWISP strongly recommends allowing WISPs that are on 3400 – 3450 GHz to enhance the level of services in rural and remote communities. This approach has been followed by Ofcom in the UK.
17. CanWISP strongly recommends that there be no moratorium for any future deployment for current licensees (urban and rural) in the 3650-3700MHz pending the development of a commercial ecosystem in the 3900-3980MHz band. A moratorium would make it impossible for WISPs to attract new investments, result in stranded investment in current networks and impede WISPs' ability to bridge the urban-rural/remote connectivity divide for subscribers (which incumbents have ignored due to the weak business case in these areas).
18. CanWISP suggests an approach similar to that employed by best practice regulators such as Ofcom (UK), for management of shared protected licenses. Under this approach, ISED would play a central role in funding a central database with a detailed predefined matrix of parameters and qualifying applicants. These parameters would be communicated to licensees in the particular licence area so when implemented, an initial preapproval is granted. In the case that licence is rejected, ISED would intervene with a predefined procedure to decide on the deployment (*Ofcom Shared Access License – Guidance Document*: https://www.ofcom.org.uk/__data/assets/pdf_file/0035/157886/shared-access-licence-guidance.pdf).
19. CanWISP sees the displacement date for urban areas of Dec 2023 as not practical and will cause service disruption or/and discontinuity as explained in point 10.
20. Under this scenario, WISPs will have to deal with a potential disruption of services for their customers in urban, rural and remote areas for the following reasons:
    a. Ecosystem Availability: According to Canadian vendors' roadmaps, the creation of a commercial ecosystem for Canadian service providers in the 3900-3980 MHz band will require 3-4 years of design, manufacturing and commercialization post completion of the FCC C-Band auction in early 2021.
    b. WISPs will need a subsequent 18-24 months - post availability of equipment for design and deployment of the new networks and CPEs. Overall, WISPs will not be able to provide commercial services in the 3900-3980 band before the end of 2026.

c. These timelines go well beyond that envisaged by ISED of Dec 2023 for urban areas and 2025 for rural areas.

d. Cost: The cost of swapping the entire current gear of LTE network (core, radios, CPEs) is going to be very high and potentially will cause many WISPs to stop provision of services to customers, as it means the entire network has to be replaced. This service interruption will be particularly felt by rural subscribers who have few options for alternative service providers (see Annex 2).

e. Time-restrictions: This displacement is dependant on 3 key dates as depicted in fig.3:

   i. TELESAT: The date that TELESAT will clear the band completely

   ii. Ecosystem: The date of commercial ecosystem availability in Canada

   iii. Auctions: post migration from 3650-3700MHz, WISPs will need spectrum for their operations. The date of the 3.5 GHz auction is June 2021 while the date for the 3.8 GHz auction is not known. In both cases, set-asides as the key procompetitive measure is necessary. Furthermore, for the 3.8 GHz auction, CanWISP strongly recommends Tier 5 licencing to ensure WISPs are able to access secure spectrum at affordable prices.

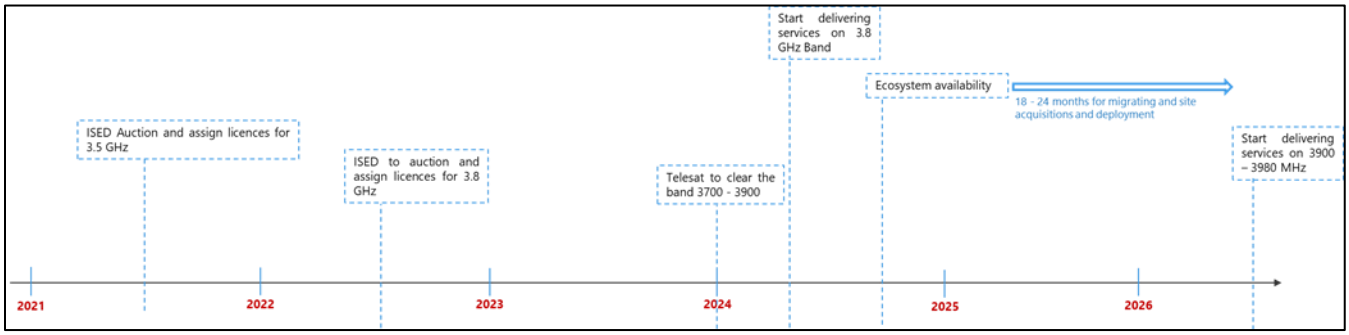

Figure 3. CanWISP Proposed timeline for Option 2 implementation

21. WISPs have a limited selection of technology partners and suppliers and will need to start network design in parallel with the displacement processes.

22. CanWISP views bands 3450 – 3650 MHz, 3500 MHz and 3650 – 4000 MHz, 3800 MHz as interconnected bands to stimulate the economy, introduce 5G services and bridge the digital gap by delivering 50/10 Mbps everywhere across Canada.

23. CanWISP under this scenario proposes that the 3800 MHz spectrum to be auctioned no later than June 2022. This spectrum is viewed as a prime band for WISPs as new entrants in the mobility stream in Canada. If ISED does not implement changes to the schedule for displacement of current service

providers in the 22 'urban' Tier 4 licence areas, then the auction date for the 3.8 GHz spectrum will need to be expedited.

24. Given the expected high demand by MNOs, it is crucial to implement the auction from 3650 – 3900 MHz band with procompetitive measures similar to the one implemented in the 3500 MHz band (40%). That is CanWISP recommends that ISED set-aside approximately 50% of the available spectrum: 120 MHz out of 250 MHz in the 3650 – 3900 MHz band.
25. The 3650 MHz- 3980 MHz is the last mid-band available that fits into WISPs business model. The next available bands are all above 6 GHz which means the coverage and range shrinks about 35% to 50% and correspondingly, more equipment and sites would be needed.
26. As a result, CanWISP views the 3.8 GHz auction with corresponding set aside and Tier 5 licensing area as key procompetitive measures, to be of vital important in order to continue and sustain WISP's services to their rural subscribers.
27. The FCC has been very successful in providing spectrum to carriers, industrial users and WISPs through a measured shared licensing approach (for example in the CBRS band). As seen in the diagram below, the FCC started the planning and consultation process, 15 years ahead of the actual auction event.

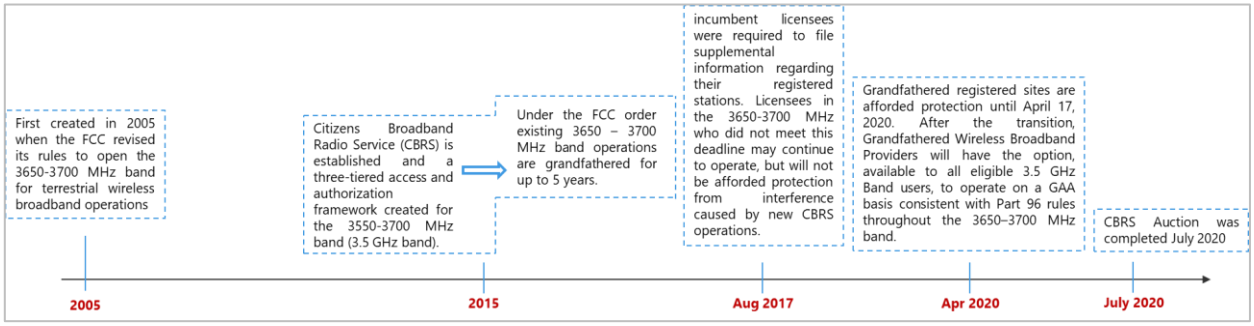

Figure 4. Shared licences timeline in the US

28. CanWISP views ISED option 2 of displacing the WBS licensees as having several critical disadvantages that will impact on WISPs' ability to bridge the digital divide:
    - The commercial ecosystem is not developed for either proprietary or standard based OEM equipment. WISPs would incur significant costs in network and CPE equipment.
    - Spectrum aggregation allows for WISPs to remain in the 3650-3700MHz band without disrupting the operations of the carriers. Current spectrum aggregation technologies allow for the aggregation of up to 150MHz of spectrum from different, non-contiguous spectrum bands without any loss in efficiency in operations.

- The timetable for provision of an alternate band - which would provide WISPs with affordable, secure spectrum to replace the 3650 MHz band, is uncertain.
- The timetable for availability of the 3900-3980 MHz band is subject to decisions by a 3rd party operator: Telesat, to evacuate the spectrum band by 2025. ISED has proposed 2023 as the migration date. One might assume that ISED and Telesat will negotiate some intermediate date - after negotiations.

In conclusion, CanWISP believes that option 1 with the modifications for management of shared-use spectrum represents the best solution to meet ISED's goals including:

- early resolution of the digital divide that would enable rural subscribers with innovative, affordable spectrum;
- long term viability and sustainability of WISPs as the only service providers which target the provision of broadband services to rural subscribers;
- competition in the rural telecommunications market that ensures a choice of services and service providers for rural subscribers;
- ensuring no disruption or degradation of internet services to rural subscribers;
- ensuring fair access to secure, affordable spectrum for WISPs to enable cost-effective roll out of innovative services to rural subscribers with the most advanced 5G-based technologies.

Scott Holmes

President, CanWISP

Annex 1: CanWISP Answers to ISED Consultation Questions SLPB-002-20

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Consultation Letter – *Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band*

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Answers to the 59 Questions

October 26, 2020

Executive Summary

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2. Canadian Association of Wireless Internet Service Providers. ("CanWISP") hereby files the following the answers to the questions in response to the Consultation Letter.

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

A1. a- The ecosystem is more mature for n78 for Canadian markets from carrier-grade OEMs while the n77 ecosystem is much less mature. Specifically, for n77, the 3900-3980 band ecosystem has not been developed.

Where OEMs have deployed on these bands globally, they are in compliance with all Canadian applicable codes such as safety code 6.

b- These bands can coexist and operate on the very same site as long as there is a special spacing, i.e. sectorizing, or spectrum spacing, i.e. frequency channels separation

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

A2. a- Contiguity is not required since all technologies, including 3gpp-based, IEEE-based and proprietary technologies, support carrier aggregation. Linkage is not providing any foreseen value to the performance of the service provided.

b- There are no such impediments as carrier aggregation is signalling-based process. The ecosystem of the bands implies that OEMs covers the entire band with the same equipment. When one moves from low to mid or high band, then the effect will be only on the number of sites, as it will require higher number of sites for higher frequency bands.

c- The majority of equipment deployed by WISP's operates from 3400MHz to 3800MHz, a few manufactures can operate up to 3900MHz but have unstable performance above 3800MHz. For WISPs, the entire gear on 3500 band – sourced from 4G LTE and proprietary vendors, would need to be replaced in option 2 move to 3800 band.

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

A3. a- CanWISP believes that the differences in technical rules would not affect the ecosystem efficiency, as OEMs will incorporate these rules at the time of manufacturing of both network and User Equipment (UE).

b- Alignment with the EU has proven to be more efficient than with the US, as their requirements tend to be stricter. However, we believe the US ecosystem will become the de facto standard in North America and thus, more available for Canadian WISPs.

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.

A4. CanWISP believes that the addition primary mobile service in band of 3700 - 4000MHz would be aligned with the world-wide deployment and utilization of the band and the proposal would provide more services to the public.

Q5. ISED is seeking comments on developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band.

A5. CanWISP favours this model, as it would allow CanWISP members to become regional mobile operators and this in turn, would enhance competition and deliver better value to the public and local communities

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.

A6. CanWISP favours migration of all FSS stations, current and future, to 4000-4200MHz. This would enable ISED to make available the entire 3700-3900 band for auctioning and the 3900-3980 band for shared services.

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.

A7. CanWISP finds this propose measure would have the benefit of isolating the FSS operations from terrestrial operations as it corresponds to best global regulatory practices such as those in the US and the UK.

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.

A8. CanWISP believes that this proposal would impede the development of the ecosystem for n77 and n78 bands in Canada and will deter incumbents and WISPs from being part of future developments in this 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

A9. a- CanWISP agrees that most FSS operators are moving rapidly to LEOs which require operating on higher frequency bands to have precise coverage and higher throughputs in the legs which is the case of Telesat, YahSat and SpaceX.

b- The process to clear the C-band is well underway in the US and has been initiated in Europe with a target of 2025.

c- CanWISP is of the view that a global B2B model is being develop with LEO technology. This will possibly enable delivery of ""transport"" to WISPs in Rural communities in cost effective way.

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.

A10. The availability of a successful commercial ecosystem will depend on the development of earth equipment capable of servicing both B2B and B2C segments as well as the availability of mandatory Landing Stations and PoPs.

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.

A11. CanWISP in favour of removing the FSS allocation in this band. The grandfathering process, in our point of view should be an intermediate phase to remove them completely by no later than 2022. This would enable more efficient operations by WISPs in this band.

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.

A12. CanWISP is in favour of this proposal since it would allow better QoS to be delivered by CanWISP.

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

A13. a- CanWISP is in favour of this method, as it will be matching the block sizing in the global telecoms markets: US, Europe, Japan, China and Arab World and South Asia. This method would also ensure compatibility with all 5G, 4G and TDD-based technologies.

b- The same comment in (a) applies.

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.

A14. a- WISPs continue to witness tremendous growth in consumer demand for Internet services amongst their subscribers, along with off loading of mobile traffic onto Wi-Fi networks. The 80MHz of spectrum from 3900-3980 is the minimum bandwidth required to accommodate new 4G and 5G applications for WISPs.

The 3GHz band spectrum provides many benefits over other options, such as the suggested 6GHz band, due to higher power limits and better propagation characteristics. Medium power Fixed Wireless deployments would provide much less interference into neighboring bands than high power mobile deployments. For example, WBS operators have been able to operate for years adjacent to the C-Band without causing major interference issues.

Therefore, CanWISP recommends ISED investigate the possibility of providing additional spectrum in the following two areas:

1. 3400-3450MHz, Countries such as Australia, Austria, Finland, Germany, UK, and others have already allocated this spectrum range for licensing.

2. 3980 – 4195MHz, Ofcom has allocated this area as shared spectrum.

b- CanWISP agrees that the highest priority should be given to current WBS licensees as public service providers in this band. CanWISP also believes that measures should be adopted 1) specifying how to enforce coordination with existing licensees and 2) prioritizing existing licensees for acquisition of new licences beyond current service areas.

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.

A15. The costs of displacement will be substantial for WISPs from hardware (HW) and software (SW) perspective. WISPs would have to swap out their entire network and correspondingly assume the entire cost of new gear (core and radios) as well as customer premise equipment (CPEs). A portion of WISPs' towers would not be able to support simultaneously both old and new equipment. These additional costs would jeopardize the WISPs' overall business model and correspondingly, their ability to service rural subscribers.

In Annex 2, CanWISP has provided in this submission examples for certain members of the estimated costs under ISED's confidentiality provision.

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.

A16. The proposed period for evacuation leading to the December 2023 deadline, is definitely too short to implement the displacement of WBS operations and would jeopardize both services to subscribers and the viability of WISPs as a category of service providers in rural areas.

From a logistics point of view, given with their size and rural customer profile, WISPs would not be in position to complete the change over in three years. Even if a commercial ecosystem were to be developed in 3 years, equipment costs for Canadian WISPs would be at a premium in the absence of an overall North American commercial ecosystem - driven by WISP buyers in the US for the same equipment.

WISPs would propose the following 3 conditions prior to migration to the 3900-3980MHz band:

1) certainty with regards to the exact timing of Telesat migration out of the 3700-3900MHz

2) availability of a commercial ecosystem in the 3900-80 MHz band

3) determination of accessibility by WISPs of UBF funding for additional costs and lost revenues incurred in the move to the 3900-3980 band.

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.

A17. CanWISP is of the opinion that the so-called 'urban areas' in fact include significant rural areas. We therefore recommend that the major metropolitan areas be carved out through a grid cell approach or preferably, the use of Tier 5 licence areas.

Q18. ISED is seeking comments on whether the moratorium should be extended to include all Tier 4 service areas.

A18. CanWISP strongly opposes to the proposed moratorium on roll out by existing licensees in all Tier 4 service areas. This measure will make it impossible for WISPs to attract new investments, result in stranded investment in current networks and impede CanWISP's ability to bridge the 'digital divide' for rural and remote subscribers. In rural portions of designed Tier 4 'urban' licence areas, many WISPs such as KOS, Routcom, Storm, NWIC, etc. have been wrongly penalized because of their proximity to a large population centres despite the fact that their primary target market are rural subscribers. The business model of these WISPs is not to compete with carriers in the urban and suburban areas contrary to that of the carriers which are actively 'cherry picking' towns and villages and leaving WISPs with only the low density rural areas. If the moratorium on the development of WISP networks is adopted, it will accelerate the aggressive behaviour of carriers and ultimately compromise the viability of WISPs and correspondingly, result in loss of broadband services to rural households.

WISPs need the coverage enabled by the WBS band and if removed due to the moratorium, many WISPs will lose substantial market share in areas where Xplornet and carriers - such as Bell, are aggressively expanding and offering increased speeds.

We note that several WISPs have submitted applications to the CRTC under its 'Broadband Fund - closing the 'Digital Divide' and the Gov. of Ontario under ICON - both based on Tier 4 deployments. The moratorium as proposed, would compromise existing and future applications by WISPs.

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

A19. a- Licensing priority in the 3900-3980 should be given to fixed wireless internet (FWA) public networks - with a flexibility option at a later date for WISP players only. MNOs should be excluded from this band

b- CanWISP suggests an approach similar to that employed by Ofcom (UK), wherein ISED would play a central role in hosting a central database with a detailed predefined matrix of parameters and qualifying applicants. The parameters are communicated to licensees in the particular licence area so when implemented, an initial preapproval is granted. In the case that licence is rejected, ISED would intervene with a predefined procedure to decide on the deployment (see flow chart)

c- CanWISP recommends that ISED devolve the coordination of deployment to a specially constituted committee - such as that currently constituted under FSCA. Alternatively, CIRA could be considered as a coordinating body.

Coordination activities would ensure safe separation distance & power output. The committee would consult with the OEMs to ensure the solutions were tailored to the specific deployments. Funding for the committee's technical coordination activities would be funded from ISED and/or new licensees.

d-CanWISP suggests technical rules similar to those adopted by Ofcom (see table attached).

e- Similar to the FCC hierarchy used for CBRS, we suggest that WISPs - as public networks, be given the highest licensing priority for the shared spectrum and protection from interference. Private commercial networks and private individuals would be given secondary and tertiary priority respectively.

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.

A20. CanWISP believes that it is better to clear this band completely from the existing FSS earth stations, as operating with no protection will only lead to degraded services on the long run which will affect ultimately the quality of transport service that satellite service providers would be potentially providing to WISPs.

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).

A21. CanWISP agrees that FSS operations in the 3700-4200 MHz band - as defined by ISED, should be able to operate in Tier 4 service areas - with one caveat. That is to say, a thin layer should be added to act as a gating factor to enable the definition of "Remote Communities" in certain areas. This would enable WISPs to provide private networks for mining and other remote sites with the help of satellite players for backhaul.

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.

A22. Yes, CanWISP believes ISED's proposal would allow some WISPs to specialize in this market segment.

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.

A23. CanWISP agrees with the proposed transition process.

Q24. ISED is seeking comments on its proposed date of December 2023 as the Canadian FSS transition deadline.

A24. CanWISP agrees with this date as reasonable. This date would be particularly important in the case that option 2 is retained.

Q25. ISED is seeking comments on how the U.S. transition will impact the availability of FSS capacity in Canada.

A25. CanWISP believes that US transition would not affect FSS capacity in Canada, as FCC is moving FSS to 4000-4200 band. The current capacity in this band is more than sufficient i.e. it would deliver 10 Gbps per leg, for satellite service providers such as Telesat and SpaceX.

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

A26. CanWISP can't advise on this matter.

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.

A27. CanWISP finds this proposed transition deadline of December 2023 for FSS earth stations to be reasonable. We note that the OEMs would not start the process of design and manufacture of new equipment in the 3900-3980 band until the FSS earth stations are cleared and ISED sets out a new licensing framework. Thus, the commercial ecosystem will not be available to WBS licensees if option 2 is imposed well beyond the 2023 date.

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).

A28. a- CanWISP believes that the proposal to protect FSS operations from interference prior to the transition should be allowed but carefully managed.

b- CanWISP believes that FSS operations after the transition deadline should be restricted except in satellite dependent areas.

c- We are in favour of this proposal

d- We are in favour of this proposal

Q29. ISED is seeking comments on the proposed change to the CTFA to add the new footnote CZZ proposed above and shown in annex B.

A29. CanWISP agrees with the intent of footnote CZZ: "As of [Transition deadline], FSS earth station operations in the band 3700-4000 MHz will operate on a no-protection basis, except for in satellite-dependent areas, as per [future decision paper].

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

A30. The most important technical and operational challenges for new mobile satellite services (MSSs) in low and medium earth orbits (LEOs, MEOs) currently being proposed and expected to be operational by the end of the decade, (often referred to as the 'Space Segment') are as follows:

* The business viability of launching, maintaining in orbit and replacing failed units for such a large number of satellites remains to be demonstrated - especially, in a competitive FSS marketplace.

* The Ground Segment, and in particular, to fixed earth stations acting as ""gateways"" to the terrestrial network deserve careful consideration because of their significant impact on the overall FSS economics.

In the specific case of Globalstar:

a- We have seen that 200 MHz is the maximum BW that is allocated to gateways to provide premium next generation services to both consumers and businesses.

b- It would be to the advantage of all Canadian service providers that the gateways be located in proximity to major network-to-network interconnection (NNI) points in the east and west of Canada.

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.

A31. CanWISP views interim authorizations as a minor source of interference that would have no impact on WISPs provided option 1 is retained. However, if option 2 is retained, it would cause intermittent interference issues and thus, CanWISP would oppose this authorization to be given to any licence-exempt earth station.

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.

A32. CanWISP is of the view that a 90-day deadline after publication is a reasonable period to submit applications.

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.

A33. CanWISP opposes this approach as these stations would cause interference with WISP operations. From an administrative viewpoint, this would result in a backlog of complaints from consumers and ultimately lead to the regulator being overwhelmed and intervention on a case-by-case basis. In that case, any dispute resolution process would be very difficult.

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.

A34. In the eventuality that option 2 is retained, such a protection in these areas would mean that WISPs would not be able to guarantee the delivery of reliable services to its rural subscribers. This wouldn't be an issue if option 1 is retained.

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.

A35. CanWISP supports this proposal in the case that option 1 is retained, as it offers smooth and easy transition for satellite-dependent areas and thus, would not affect WISPs operations. However, in the case of option 2, CanWISP rejects this proposal.

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.

A36. CanWISP is in favour of this proposal, as it will allow all WISPs to provide reliable services to their rural subscribers.

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.

A37. CanWISP is in agreement with this approach and see it meeting all parties' requirements for providing services.

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.

A38. CanWISP is in favour of all the conditions that are detailed in annex G; G1 to G9.

Q39. ISED is seeking comments on the proposed eligibility of licence-exempt stations that could apply for an interim authorization.

A39. CanWISP's view that in satellite-dependent areas this would have no impact. In non-satellite dependent areas, the eligibility should be tied to the following parameters:

1- Received Power

2- Availability of alternatives for the service

3- Proximity to serving WBS sites

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.

A40. CanWISP believe that this proposal would have no impact on the operations of its members.

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.

A41. CanWISP is in favor of providing new licences for fixed point to point services in the 4000 to 4200 band.

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.

A42. CanWISP is in favour of this proposal since it protects these links that mostly act as backhauling service.

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.

A43. CanWISP strongly supports this approach, as it gives WISPs the flexibility to deploy the most effective solutions that fit their both budget and customers needs.

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.

A44. For WBS service providers in the scenario of shared spectrum, CanWISP recommends an approach similar to that of Ofcom (see Q.19).

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?

A45. a- CanWISP suggests following the same approach as suggested in our answer to Q.19. b- CanWISP believes that RSS-192 and SRSPs-520 are sufficient and no further measures are needed.

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.

A46. CanWISP strongly supports this coordination process as enabler of flexible use. It will give the opportunity for both incumbents and WISPs to participate and extend their services to Canadians.

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.

A47. CanWISP supports this proposal as, it has been proven as an enabler of efficient spectrum utilization in its current operations.

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 OOBE limit) and the U.S. (i.e. a combination of guard band, a typical OOBE limit, pfd limits, and baseline minimum filter specifications for earth station operations) and the current Canadian requirements (i.e. a typical OOBE limit and coordination distance).

A48. CanWISP finds the EU technical requirements are the most comprehensive. However, in recognition of border coordination issues, we would support implementation of the alternative US specifications.

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?

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)?

A49. CanWISP sees the hybrid approach using the parameters of power and separation distance, as the best approach to cover all the scenarios such as those in the remote and rural areas or special areas where there is an industrial venue near an urban area.

a- The key benefit from the co-existence measures would be better services from both satellite and terrestrial services providers and more efficient utilization of the spectrum.

b- Although the EU approach is preferable due to the more comprehensive restrictions, we see the US approach as more practical for implementation given potential interference issues on the border.

c- CanWISP does not see other considerations, beyond those presented already for option 1.

d- CanWISP agrees that the best practice would be the implementation of 20 MHz channel guard band.

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?

A50. We have no comments on this matter.

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?

A51. CanWISP finds this separation of bands is more than sufficient for the coexistence between these two operations and no further technical requirements are needed.

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.

A52. CanWISP supports this process as a means of releasing 3800 MHz spectrum. It will give the opportunity for both incumbents and WISPs to participate and extend their services to Canadians. However, given the relative commercial power of the incumbents, the interests of the WISPs as a public service providers targeting rural areas, should be protected by the use of set asides along with use of Tier 5 licensing as key pro-competitive measures and this in turn, would ensure access to affordable, secure spectrum.

Q53. 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.

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.

A53. CanWISP believes that the spectrum currently authorized for Telesat's use in the 3700-3900 band should be auctioned by ISED along with key pro-competitive measures of set asides and Tier 5 licensing, as this would serve the best interests of Canadians and allow Canada to be aligned with international telecom markets with the same band capacity.

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

A54. a- CanWISP views Telesat' s proposal - if adopted, would be contradictory to ISED's policy objectives and in particular, to its goals for reducing the rural connectivity divide.

b- With regards to competition, Telesat's proposal for licensing in the secondary market 3700-3900 spectrum does not address the issue of procompetitive measures.

c- CanWISP s believes that Telesat' s proposal would not enable additional mid-band spectrum for 5G applications - over and above its obligation to migrate out of the band.

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 areas 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 flexible use and aeronautical radionavigation systems

g- the overall impact on existing users in the 3700-4200 MHz band

A55. a- CanWISP supports Telesat' s proposal (point 61 page 27) that the primary allocation for FSS be in band 4100-4200.

With regards to band 3700 - 4100, it is CanWISP 's view that the FSS receive-only and earth stations should be allocated on a 'no-protection' basis. Only the gateway earth station should be protected from terrestrial operations.

b- CanWISP views Telesat proposal to be aligned with the WISPs point of view - with the exception of expediting the transition date with the help of, and facilitation provided by ISED.

c- CanWISP strongly supports maintaining WBS licenses in 3650-3700 along with adoption of Telesat' s proposal.

d- CanWISP believes this interim authorization measure to be necessary; however, it should be subject to a limited focus and time-frame.

e- CanWISP supports Telesat proposal for co-existence between US FSS and Canadian terrestrial services in border areas as this would provide the technical parameters for managing coexistence between FSS and flexible use.

f- CanWISP supports ISED proposal on this point as it serves the objective of delivering the best service to Canadians in rural and remote areas.

g- CanWISP believes that the impact would be minimal - subject to the adoption of option1 along with procompetitive measures, and would in fact, provide an opportunity for WISPs to substantially increase their ability to attract new investment and extend services to more rural and remote communities across Canada.

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

A56. a- CanWISP views this proposal serves the best interest of Canadians by ensuring the best use of the spectrum. We support Telesat proposal on this matter.

b- While CanWISP believes Tier 4 licence is preferable to Tier 1 for WISPs, it is CanWISP's position that ISED should adopt Tier 5 as the basis for licensing of the 3500 - 3800MHz bands as it is necessary for WISPs to access affordable spectrum.

c- CanWISP viewpoint is that deployment conditions are heavily dependent on the final decision of the Minister on the entire licencing and management of this band. Accordingly, we are aligned with the view that the deployment requirements should come into force after Minister approves the entire framework not just the transfer.

d- CanWISP is in favour of the inclusion of pro-competitive measures: set asides and Tier 5 licensing, as an integral part of auctioning of the 3500 MHz and 3800 MHz bands. CanWISP agrees with the 50% set-aside proposal.

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

A57. a- CanWISP believes that pro-competitive measures are vital to the success of auctioning in the 3700-4100 band, as these would give WISPs the opportunity to participate and seek investments for early deployment of 5G standardized equipment and ecosystems.

b- CanWISP strongly recommends that ISED adopt a set-aside provision of 50% of the spectrum for WISPs as the key pro-competitive measure in the auction framework rather than the adoption of a spectrum cap.

c- As stated above, 50% of available spectrum in each Tier-4 licence area should be incorporated into the set aside provision.

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.

A58. CanWISP supports Telesat' s proposal for transition FSS earth stations as an innovative approach that would hasten clearance of the earth stations' spectrum and thus, allow WISPs to expand their services in rural and remote areas.

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.

A59. a- CanWISP believes that standardized 5G equipment will only be available once the OEMs design and manufacture equipment specifically for the 3900-3980 band following designation of this band by ISED. This will take at least 3 to 4 years. This would be consistent with previous experience whereby, once consensus has been reached through the 3GPP consultation process - including OEMs, operators, regulators, ITU and research institutes, the global ecosystem responds very quickly to develop commercial equipment for service providers.

b- CanWISP believes FSS filters will be commercially available, as the technology which enables the manufacturing of FSS filters - tailored to different markets and bands, has become a standard commodity in the industry.

c- CanWISP believes that 100MHz of spectrum will be more than sufficient - from capacity perspective, for satellite service providers in light of the multiplexing technology and orbital arrangements.

d- CanWISP is of the view that receiving-only stations in border areas would have a minimal or no impact on the flexible use stations. Furthermore, with the exception of very low power units, there will be no transmitting FSS stations located in the immediate vicinity of the border. CanWISP believes that there will be no impact on the value of the spectrum to either WISPs and/or mobile operators as they can switch stations and UEs to other spectrum to continue their 5G services.

Annex 2: Evaluation of Displacement Costs

CanWISP has undertaken a costing exercise based on the current logistics and supply chain that its members use to procure their network gear.

CanWISP has determined that members WISPs currently use either LTE-Based solution or PtMP propriety solutions. LTE-based solutions are either carrier grade or propriety solutions.

Displacement to 3900 – 3980 MHz would introduce two challenges

- As the 3900 – 3980 MHz band is a 5G band, there will be no LTE gear available in this band; only 5G-based gear.
- Propriety solutions, PtMP, will only be available four years from now.

The following assumptions have been made for a standard WISP operation:

1- The network size is 40 sites
2- The core is small, supporting up to 10,000 UEs
3- Site costs include decommissioning and new site installation as well as radio equipment cost per site

The costs are reflected in the figure below.

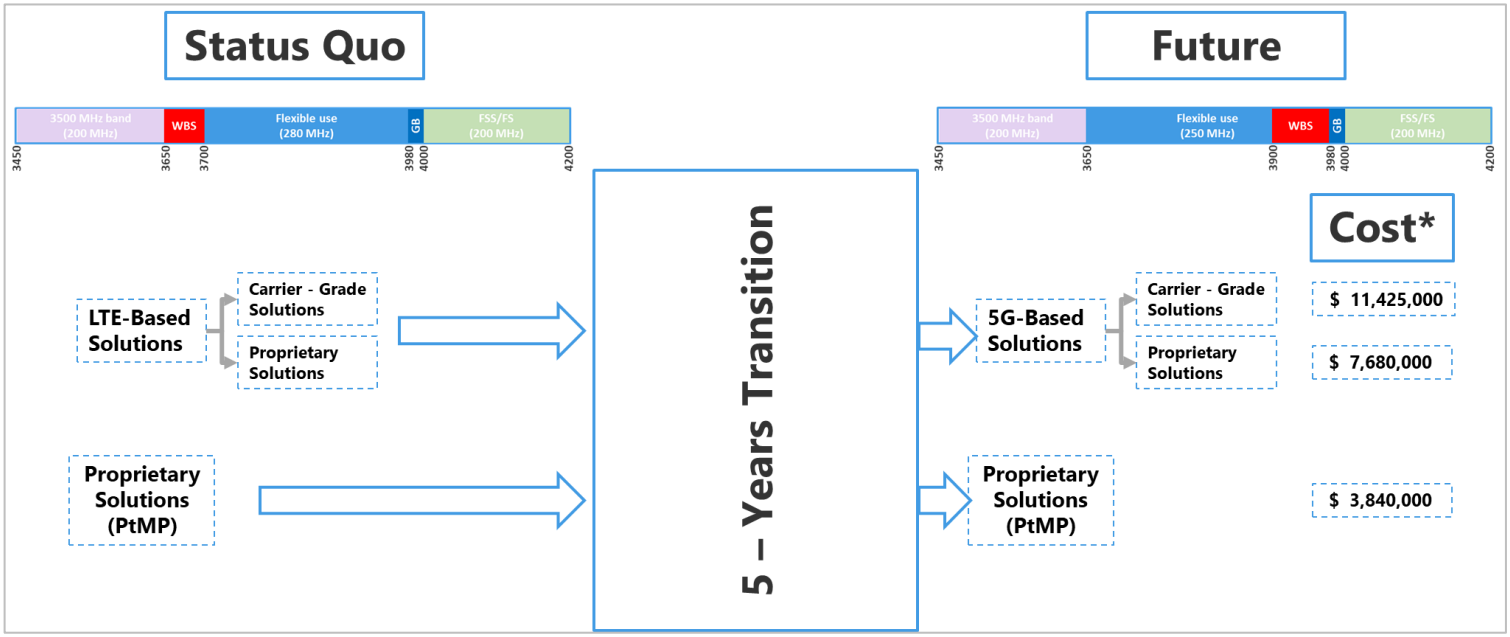

Figure 5: Displacement Cost