

CANADA GAZETTE NOTICE NO. SLPB-004-18

**CONSULTATION
ON REVISIONS TO THE 3500 MHZ BAND TO ACCOMMODATE
FLEXIBLE USE AND PRELIMINARY CONSULTATION ON CHANGES
TO THE 3800 MHZ BAND**

**PUBLISHED IN THE *CANADA GAZETTE, PART I*
ON 16 JUNE 2018**

**COMMENTS
OF
BELL MOBILITY INC.**

12 JULY 2018

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1.0 **EXECUTIVE SUMMARY**

1. In accordance with the procedure set out by Innovation, Science and Economic Development Canada (the Department or ISED) in Notice No. SLPB-004-18, *Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band* (the Consultation), dated 6 June 2018, we are providing our Comments on the proposed revisions to the 3450–3650 MHz band (referred to as the 3500 MHz band) to accommodate flexible use, as well as proposals for potential changes to the 3400-3450 MHz band and the 3650–4200 MHz band (referred to as the 3800 MHz band).

Expanding Flexible Use in the 3500 MHz Band

2. The Department's stated objectives for this Consultation are to:

- foster innovation, investment and the evolution of wireless networks by enabling the development and adoption of 5G technologies;
- support sustained competition, so that consumers and businesses benefit from greater choice; and
- facilitate the deployment and timely availability of services across the country, including rural areas.¹

3. We support these objectives, but conclude they can be more efficiently and effectively accomplished by altering the Department's proposed approach. While we agree with the Department's proposal to reallocate 3450-3650 MHz for flexible use and create a band plan around 10 MHz unpaired blocks, the Department should allocate more than the currently proposed 200 MHz spectrum towards flexible use in the near term. Operators who wish to deploy 5G in this band will require large amounts of contiguous spectrum, and allocating only 200 MHz spectrum will delay deployment and curtail the potential benefits and innovations that 5G technologies promise.

4. Allocating an insufficient amount of spectrum will also impact the ability of existing licence holders to continue serving their fixed wireless customers, the majority of whom reside in rural communities and have few comparable options for broadband connectivity. To ensure that sufficient spectrum is made available in a timely manner, the Department should designate 3400–3450 MHz and 3700–3800 MHz as flexible use and auction it as part of the 3500 MHz

¹ The Consultation, paragraph 10.

band in 2020. This will result in 350 MHz of spectrum that can be used for rural broadband and the deployment of 5G services. With the additional 175 MHz of spectrum in 3400-3475 MHz and 3700-3800 MHz, the Department would be able to auction 175-350 MHz of spectrum, depending on the licence area, without requiring existing licensees to return spectrum.

5. Designating 3400-3800 MHz spectrum as flexible use is consistent with the International ecosystem development. As indicated by the European Commission's Radio Spectrum Policy Group (RSPG):

The RSPG considers the 3400-3800 MHz band to be the primary band suitable for the introduction of 5G-based services in Europe even before 2020, noting that this band is already harmonised for mobile networks, and consists of up to 400 MHz of continuous spectrum enabling wide channel bandwidth. This band has the possibility to put Europe at the forefront of the 5G deployment.²

6. Spectrum from 3800-4200 MHz will be important for 5G deployments in the future, and the Department should plan to allocate this band for flexible use by allowing mobile and fixed services to operate. Given that the ecosystem for 3800 MHz is expected to develop later than that for 3500 MHz, it is possible to develop a more extended transition timeline in this band. We believe that fixed and mobile services can potentially co-exist with Fixed Satellite Service (FSS) systems using techniques such as geographical exclusion zones, shielding, and/or potentially band pass filters in the short term, especially as use of C-Band satellite diminishes near the populated areas where 5G will first be deployed. Ultimately, however, the Department should plan to require FSS systems to relocate and be compressed into a smaller portion of the band with the objective of eventually vacating the band altogether. This would be consistent with the Department's view in the Spectrum Outlook 2018-2022 that "spectrum should be made available in Canada to keep pace with international markets and global technology development".³

Treatment of Existing Licence Holders

7. The Department has proposed to seize a portion of existing licence holders' spectrum and reallocate it via auction when their current licences are exchanged for new flexible use licences. We believe this is inappropriate. As licence holders, we invested to acquire

² European Commission Directorate-General for Communications Networks, Content and Technology, Radio Spectrum Policy Group, RSPG16-032 Final, "Strategic Roadmap Towards 5G for Europe: Opinion on Spectrum Related Aspects for Next-Generation Wireless Systems (5G)", page 3.

³ Spectrum Outlook 2018 to 2022, page 3.

3500 MHz spectrum and to deploy a network using the band. We met our deployment conditions despite significant, prolonged technology limitations. In 2017, we successfully deployed a new time division duplex (TDD) long-term evolution (LTE) network and rolled out a commercial fixed Wireless-to-the-Home (WTTH) service to select rural communities. A more extensive deployment program began in 2018 and our current plan is to accelerate this further in 2019 and beyond. Our WTTH service is an innovative alternative in rural communities that are unserved or underserved by wireline broadband. The deployment of these services supports the Department's objective of having timely availability of services across the country, including in rural areas.⁴ Thus, seizing a portion of existing licence holders' spectrum as proposed by the Department is contrary to the Department's own rural broadband objectives and is entirely unnecessary given that the 3500 MHz spectrum band can be expanded to make more spectrum available.

8. In the Consultation, the Department has proposed that existing licensees return spectrum which they had previously acquired at auction or obtained through acquisition or other legitimate means. We believe this proposal is inappropriate for several reasons.

- i. First, the spectrum is now, or soon will be, used to provide broadband service to customers, many of whom reside in rural areas and have limited or no competitive alternatives. The availability and/or quality of the service these customers receive would inevitably be negatively impacted if a significant amount of spectrum must be returned.
- ii. Second, while the Department considers that incumbent licensees will be able to continue providing fixed services after a portion of their spectrum is returned, this is entirely dependent on the amount of spectrum that must be returned. It is far from certain that current services and service levels will be maintained under the two options included in the Consultation.
- iii. Third, the Department's stated rationale for forcing the return of spectrum is to ensure that sufficient spectrum will be available for new 5G services. However, existing licensees are capable of developing and introducing 5G services with their current allotments.

⁴ The Consultation, paragraph 10.

iv. Fourth, existing licence holders have invested tens of millions of dollars to acquire 3500 MHz spectrum and deploy networks using the band. A forced return of spectrum would discourage future investment and innovation in the industry as licensees would always be concerned that their licences could be appropriated by the Government at any time simply because demand for the spectrum had increased. Such an outcome would be completely contrary to the Government's policy objectives.

9. With regard to the amount of spectrum that current licensees are expected to return, it is unclear whether the Department has taken into account the particular circumstances of the Inukshuk Wireless Partnership.⁵ Paragraph 46 of the Consultation states that "[c]alculations will be based on the spectrum holdings as of the date of this publication", and "[a]ny subsequent licence transfers or divisions of a licence by area and/or frequency will not alter the total amount of spectrum available to incumbents for flexible use". This could be interpreted as the Inukshuk Wireless Partnership being treated as a single licensee rather than calculating spectrum holdings based on Bell's and Rogers' individual interest in the partnership, although it seems unlikely that this would be the Department's intent. If it is indeed the intent of paragraph 46, Bell and Rogers would be significantly disadvantaged relative to all other current licensees.

10. On several occasions, the Department has recognized that Bell and Rogers each have access to 50% of the Inukshuk Wireless Partnership's spectrum licences and implemented regulatory decisions as if the licences were held independently by Bell and Rogers. For example:

- On 27 February 2014, the Department denied the transfer of spectrum licences from NextWave to Inukshuk Wireless Partnership.⁶ The Department's rationale was that: "if the transfer was approved, it would represent a significant shift in spectrum concentration in the WCS band", since "Bell and Rogers, through Inukshuk, would increase their combined WCS spectrum holdings from 29 percent to 77 percent."

⁵ Inukshuk Wireless Partnership is a 50/50 partnership between Bell Canada and Rogers Communications Inc. and holds the partners' 3500 MHz spectrum licences.

⁶ Transfer of Spectrum Licences Held by 4253311 Canada Inc. (NextWave) to Inukshuk Wireless Partnership (Inukshuk), 27 February 2014, paragraph 6. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10762.html>.

- On 15 January 2015, the Department approved the transfer of spectrum licences held by Inukshuk Wireless Partnership to Bell Mobility Inc.⁷ The Department stated "that Inukshuk is a partnership between Bell and Rogers Communications Partnership, with each owning a 50% partnership interest", and "as the Licences would continue to be controlled by Bell post-transfer, the transfer will not result in any change in spectrum concentration".
- Also on 15 January 2015, the Department approved the transfer of spectrum licences held by Inukshuk Wireless Partnership to Rogers Communications Partnership.⁸ Again the Department stated "that Inukshuk is a partnership between Rogers and Bell Mobility Inc., with each owning a 50% partnership interest", and "as the Licences would continue to be controlled by Rogers post-transfer, the transfer will not result in any change in spectrum concentration".

11. As the above examples show, the Department's track record of treating Inukshuk Wireless Partnership as two separate partners has established a precedent for how the Inukshuk Wireless Partnership should be treated in terms of 3500 MHz spectrum policy. Specifically, for the purpose of establishing the amount of spectrum that existing licensees must return to the Department, and consistent with the Department's past practice, the calculation of spectrum holdings should be based on each Partner's individual interest in the partnership.

12. As indicated in the legal opinion prepared by Goodmans LLP in the attached Appendix, calculating spectrum holdings based on each Partner's individual interest in the partnership is consistent with general partnership law, the treatment of partnerships by other Canadian regulators and statutes, and how the partnership is treated under generally accepted accounting principles. Goodmans LLP concludes: "in its implementation of the options proposed in the Consultation, ISED should treat the Licences in a manner consistent with general principles of Canadian partnership law and ISED's historical treatment of the Licences. To apply this treatment, ISED should determine any reduction of existing spectrum or future spectrum allocation on a Licence-by-Licence basis, calculated for each Partner based on its undivided

⁷ Transfer of Spectrum Licences Held by Inukshuk Wireless Partnership (Inukshuk) to Rogers Communications Partnership (Rogers), 15 January 2015, paragraph 6. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10922.html>.

⁸ Transfer of Spectrum Licences Held by Inukshuk Wireless Partnership (Inukshuk) to Rogers Communications Partnership (Rogers), 15 January 2015, paragraph 6. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10923.html>.

proportional interest in each Licence corresponding to such Partner's percentage ownership interest in the Partnership".⁹

13. If the Inukshuk Wireless Partnership is treated as a single licensee, as paragraph 46 of the Consultation seems to suggest, then under return of spectrum Option 2, Bell and Rogers would be uniquely and unfairly penalized.¹⁰ For example, if the Inukshuk Wireless Partnership has 100 MHz of spectrum and is treated as a single licensee, then under Option 2, the Inukshuk Wireless Partnership would retain 50 MHz of spectrum when the new flexible use licences are issued and Bell and Rogers would each retain 25 MHz of spectrum. If, on the other hand, the Inukshuk Wireless Partnership has 100 MHz of spectrum and the calculation of spectrum holdings is based on each partners' individual interest, then Bell and Rogers would each retain 50 MHz of spectrum under Option 2 when the new flexible use licences are issued. More generally, under Option 2, if the Inukshuk Wireless Partnership is treated as a single licensee, there will exist situations where both Bell and Rogers must return half of their current spectrum holdings while other licensees must return none.

14. Seizing spectrum in this band would undermine the Department's stated objectives and run counter to existing auction policy because it would discourage innovation, investment and the evolution of wireless networks. This could negatively impact hundreds of communities due to delayed access to high-speed broadband services that would allow them to fully participate in Canada's digital economy. It will also unnecessarily delay the deployment of 5G systems, the timely development of which is a key objective of this Consultation. Further, allowing existing licensees to retain their spectrum does not impede the opportunity for others to compete in this band.

15. If the Department requires existing licence holders to return a portion of their spectrum, the Department should only require the return of one-third of existing spectrum holdings. This would more closely align with Canadian precedents than either of the two options set out in the Consultation. It would also leave existing licence holders with sufficient amounts of contiguous spectrum to support their existing customers and begin 5G deployment. A rule that allows existing licensees to keep two-thirds of their current holdings would leave between 80 MHz and

⁹ Goodmans LLP, "Legal Treatment of Spectrum Licences Recorded in the Name of Inukshuk Wireless Partnership", page 2.

¹⁰ Note that this issue only arises if the Department adopts the proposed Option 2. However, as discussed below, adopting either Option 1 or Option 2 would be poor public policy which will discourage innovation and investment.

200 MHz of spectrum in the 3450-3650 MHz frequency range available for auction, with the vast majority of regions having between 80 MHz to 90 MHz available. This would be a sufficient amount of spectrum to allow other operators access to the spectrum band.

16. Moreover, with access to the additional 175 MHz of spectrum in the 3400-3475 MHz and 3700-3800 MHz frequency ranges, the Department would be able to allocate 255-265 MHz of spectrum in the vast majority of regions. The allocation of flexible use spectrum in these frequencies will put Canada at the forefront of commercial mobile network deployments, allowing Canadians to continue to benefit from cutting-edge wireless services and applications and ensuring Canada's mobile networks remain world-class.

17. To support this outcome, our key recommendations are:

- in addition to 3450-3475 MHz, the Department should designate spectrum in 3400-3450 MHz and 3700–3800 MHz as flexible use which will result in 350 MHz of spectrum that can be used for existing services and the deployment of new 5G services;
- existing licensees should not be required to return spectrum as it would undermine the Department's stated objectives;
- if existing licence holders are required to return a portion of their spectrum, the Department should limit the amount to one-third of existing holdings, which would more closely align with Canadian precedents;
- for the purpose of establishing the amount of spectrum that existing licensees must return to the Department, and consistent with the Department's past practice, Bell's and Rogers' spectrum holdings should be calculated based on each Partner's individual interest in the Inukshuk Wireless Partnership; and
- the Department should plan for the eventual requirement to relocate and/or compress FSS systems into a smaller portion of the 3800-4200 MHz band with the objective of eventually vacating the band altogether.

18. The remainder of our comments address the specific questions posed in the Consultation.

2.0 TIMING AND INTERNATIONAL DEVELOPMENT

Q1. ISED is seeking comments on its assessment of the timelines identified for the development of an equipment ecosystem for 5G technologies in the 3500 MHz and 3800 MHz bands, and whether the timelines will be the same in both bands.

19. We generally agree with the Department's assessment of the timelines associated with developing a 5G equipment ecosystem in the 3500 MHz and 3800 MHz bands. As the Department noted, 3rd Generation Partnership Project (3GPP) is developing 5G standards based on two primary bands: n78, which covers the frequency range 3300-3800 MHz; and n77, covering the extended range 3300-4200 MHz. The extended range of n77 poses greater technical challenges to implement than n78, and the spectrum above 3800 MHz is awaiting clearance from international standards bodies. Consequently, we expect that the 3800 MHz band will develop later than 3500 MHz, with its development gaining traction shortly after World Radio Conference 19 (WRC-19).

20. The Consultation highlighted the example of the Citizen Broadband Radio Service (CBRS) system in the United States.¹¹ The full benefits of 5G cannot be realized on small bandwidth assignments like those in CBRS, so there will be little incentive for operators to upgrade from LTE. Should the United States decide to open the upper band, we anticipate that United States operators will choose n77 equipment over CBRS equipment in all assignments due to the benefits offered by global compatibility.

21. In terms of standards development, the majority of operators intend to implement 5G as an adjunct to their LTE network. Consequently the focus for specifications and device development has been on Non-Stand-Alone (NSA) deployments. In other words, the network will use a 4G core, and control the 5G radio by anchoring the control through an LTE radio. As such, user equipment ecosystems need to develop around specific pairings of LTE bands, first with n78, and eventually n77.¹² n78 Stand-Alone (SA) product may develop eventually, but existing operators in other countries will not be looking for this capability for many years to come. At the outset, this SA capability would only be of interest to new operators, and it is doubtful that many would be able to drive product development on their own.

¹¹ The Consultation, paragraph 17.

¹² These Dual Connectivity pairings are designated as EN-DC_xA-n78, where x is the LTE band.

22. Notably, because neither n78 nor n77 are currently envisioned for United States 5G deployments, no "North American" ecosystem will exist in the short term. In anticipation of 3500 MHz use for 5G in Canada, steps have been taken to include Canadian spectrum possibilities in 3GPP Release 15 standards, and work is continuing to add Canadian carrier aggregation combinations in Release 16. With these specifications in place, the first commercial NSA devices could emerge as soon as next year.

3.0 THE 3500 MHZ BAND

3.1 Changes to Allocations in the Band

23. The Department proposes to make 200 MHz of flexible use spectrum available in the 3500 MHz band.¹³ As the Department has acknowledged in this Consultation and others, the 3500 MHz band is critical for the timely deployment of 5G networks. While 200 MHz of spectrum is a positive first step, it will be insufficient to address the needs of Canadians. Moreover, there is considerably more spectrum in this frequency range that could be allocated immediately. Therefore, the Department should extend the 3500 MHz band down to 3400 MHz and up to 3800 MHz. In addition to including 3450-3475 MHz as proposed by the Department, additional spectrum can be allocated by designating the 3400-3450 MHz portion of the band as flexible use. As noted below, spectrum sharing may be possible by using geographical separation as long as an appropriate exclusion zone is established between users.

24. We concur with the assessment in the recent Spectrum Outlook consultation that the overall demand for FSS applications in the C-band in Canada is expected to decrease over the next five years.¹⁴ As a result, the Department should expand the 3500 MHz band to include 3700-3800 MHz and move existing FSS users to above 3800 MHz. This is consistent with other jurisdictions that have identified the C-band for reallocation to 5G service. While the needs of remaining FSS C-band users should be carefully considered, the importance of 3700-4200 MHz to the deployment of future 5G services must take precedence.

25. The ecosystem for the 3700-3800 MHz spectrum range will be developed at the same time as the rest of the 3500 MHz spectrum band intended for auction, and would provide an additional 100 MHz of spectrum for flexible use right away while not placing undue pressure on the available bandwidth for FSS systems. Expanding the 3500 MHz band to include

¹³ The Consultation, paragraph 32.

¹⁴ Innovation, Science and Economic Development Canada, SLPB-006-17 *Consultation on the Spectrum Outlook 2018-2022*, paragraph 75.

3400-3475 MHz and 3700-3800 MHz as flexible use will provide an additional 175 MHz of spectrum for the Department to allocate in an auction without any requirement for existing licensees to return spectrum. This would result in the Department being able to allocate 175-350 MHz of spectrum.

26. We recognize that significant costs could arise in moving FSS systems. As a result, we recommend that the Department compensate FSS providers for their relocation costs (if required) from auction proceeds. In fact, compensating licensees who must relocate from the proceeds of spectrum auctions should become a Departmental policy. This would facilitate more efficient and timely spectrum evolutions to the benefit of all Canadians, while reducing any associated negative impacts on existing licensees.

27. While the Department's first priority must be to ensure mobile operators have access to 3700-4200 MHz for 5G deployments, we believe that co-existence with FSS systems using transition timing and techniques such as geographical exclusion zones can achieve this objective in the short term. Transition timing and geographical exclusion zones may be particularly important for Northern communities which generally rely more heavily on services using C-Band spectrum. Thus, as part of any transition process, we recommend that the Department consider providing longer transition times in Northern communities if required.

28. Designating 3400-3800 MHz spectrum as flexible use is consistent with the International ecosystem development. As indicated by the European Commission's RSPG:

The RSPG considers the 3400-3800 MHz band to be the primary band suitable for the introduction of 5G -based services in Europe even before 2020, noting that this band is already harmonised for mobile networks, and consists of up to 400 MHz of continuous spectrum enabling wide channel bandwidth. This band has the possibility to put Europe at the forefront of the 5G deployment.¹⁵

29. Access to large blocks of contiguous spectrum is necessary for the full benefits of 5G technologies to be realized. This is, in part, because the majority of the gains associated with 5G result from its ability to support larger bandwidths than LTE. Whereas LTE was designed for peak efficiency when employed with 20 MHz bandwidths, 5G for 3500 MHz reaches its peak efficiency in 100 MHz channels. Conversely, waveform changes only improve spectral

¹⁵ European Commission Directorate-General for Communications Networks, Content and Technology, Radio Spectrum Policy Group, RSPG16-032 Final, "Strategic Roadmap Towards 5G for Europe: Opinion on Spectrum Related Aspects for Next-Generation Wireless Systems (5G)", page 3.

efficiency by eliminating the need for traditional LTE guard bands, which is a relatively small improvement compared to the broader benefits of 5G.

30. While 3GPP recognizes that 100 MHz channels may not always be possible and has designed equipment standards to accommodate smaller channel sizes, anything smaller than 100 MHz will result in less efficiency. As noted by Huawei, "the availability of at least 100 MHz channel bandwidth per 5G network with the adoption of massive MIMO will boost peak, average and cell edge throughput with affordable complexity".¹⁶ Similarly, Ericsson states "100 MHz TDD Channel[s are] key to providing an expected peak rate of 1.8 Gbps, [and] delivering a true 5G experience".¹⁷

31. Another feature of 5G technology is network slicing which will use attributes specific to the air interface (e.g., variable numerology parameters – different sub-carrier spacing and symbol lengths). Network slicing will allow the selection of spectrum, base station locations, and the values for these attributes will create a specific service definition numerology. For instance, a service might be defined as having an ultra-reliable and low-latency communications (URLLC) requirement, which will have a very specific numerology. The problem is that these air interface attributes are not defined for all bands or bandwidths, and bandwidths below 40 MHz have limited sets or subsets of these parameters. The smaller the bandwidth, the more limited the capabilities to define unique service requirements. At or below 20 MHz, capacity is gained only through extra guard band utility and reduced control overhead. Otherwise, there are no other 5G benefits. In addition, the economics of deploying massive multiple-input and multiple-output (MIMO) become prohibitive with smaller bandwidths. Therefore, the more spectrum the Department can make available for flexible use, the more effectively and efficiently operators can begin to deploy 5G systems.

¹⁶ Huawei, "5G Spectrum: Public Policy Position", page 2, available at https://www-file.huawei.com/-/media/CORPORATE/PDF/public-policy/public_policy_position_5g_spectrum_2018.pdf?la=en&source=corp_comm.

¹⁷ Ericsson, "C-band NR Requirement vs. satellite spectrum usage," submitted to FCC Re: Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, GN Docket No. 17-183. Available at <https://ecfsapi.fcc.gov/file/10329453530188/Ericsson%20Mid%20Band%20Ex%20Parte%20GN%2017-183%20COMBINED%20TO%20BE%20FILED.pdf>.

Q2. ISED is seeking comments on the proposals for:

- **adding a primary mobile allocation to the 3450–3475 MHz band**
- **removing the radiolocation allocation in the 3450–3500 MHz band**
- **making the corresponding changes to the Canadian Table of Frequency Allocations**

Q3. ISED is seeking comments on the proposal to allow flexible use in the 3450-3475 MHz band.

32. We agree with the Department's proposal to add a primary mobile allocation in the 3450-3475 MHz band, and to allow flexible use in this portion of the band. We also agree with the Department's proposal to remove the priority for radiolocation use in the 3450-3475 MHz band. As indicated in the Consultation, it is not expected that removing the priority for radiolocation in the band will negatively impact the operation of government radiolocation systems or existing fixed point-to-point usage. We also support making the corresponding changes to the Canadian Table of Frequency Allocations.

Q4. ISED is seeking comments regarding interest in sharing spectrum between radiolocation and other services in the 3400–3450 MHz band, and options for doing so.

33. As noted above, additional spectrum can be allocated by the Department by designating the 3400-3450 MHz portion of the band as flexible use. While we understand the challenge posed by the need for co-existence, we do not believe that dynamic spectrum sharing is appropriate outside of a multi-operator core network (MOCN) approach. This is particularly true in TDD spectrum, where synchronisation is required. Synchronisation requires uplink and downlink coordination, which would be extremely difficult to maintain in a dynamic access system. In addition, new technologies such as cognitive radio and dynamic spectrum access are not yet proven and would require a different ecosystem of equipment than those currently in use or under development which would delay the benefits of 5G technology.

34. With respect to 3400-3450 MHz, sharing may be possible by using geographical separation as long as an appropriate exclusion zone is established between users. Thus, there may be an opportunity to share in areas that are sufficiently isolated, perhaps applications with indoor or remote use, or with time-of-use limitations. Examples of sharing spectrum through geographic separation for the Fixed Wireless Access (FWA) band exist today. For example, Vancouver Island (service areas 4-154, 4-155 and 4-156) was not made available for licensing due to occasional interference due to radiolocation services. As well, First-Come First-Served

(FCFS) licenses are presently held by operators that operate in the 'A' and 'B' blocks, which correspond to 3400-3425 MHz and 3425-3450 MHz, respectively. Additionally, some non-critical machine-to-machine applications may be able to operate adequately in the presence of harsh interference.

3.2 Treatment of Existing Users

Q5. *ISED is seeking comments on the expected impacts of the following options with regards to the continuation of existing services, competition in the Canadian marketplace and availability of new 5G services for Canadians.*

Option 1: For each licence area, existing licensees would be issued flexible use licences for one third of their current spectrum holdings rounded to the nearest 10 MHz, with a minimum of 20 MHz.

Option 2: For each licence area, existing licensees would be issued flexible use licences for a fixed amount of spectrum. Any licensee that holds 50 MHz of spectrum or more would be licensed for 50 MHz, and all other licensees would be licensed for 20 MHz.

Q6 *ISED is seeking comments on alternative options for licensees to return spectrum to the Department to make available for a future licensing process. Respondents are asked to provide a rationale for any alternative proposals, including how they would meet ISED's policy objectives as stated in section 3.*

35. In the Consultation, the Department has proposed that existing licensees return spectrum to ISED which they had previously acquired at auction or obtained through acquisition or other legitimate means. We believe this proposal is inappropriate. Spectrum is now, or soon will be, used to provide broadband service to customers, many of whom reside in rural areas and have limited or no competitive alternatives. The availability and/or quality of the service these customers receive would inevitably be negatively impacted if a significant amount of spectrum must be returned.

36. Existing licence holders have invested tens of millions of dollars to acquire 3500 MHz spectrum and to deploy networks using the band. For example, we took the risk of investing in the acquisition of 3500 MHz spectrum and deploying a network using this band. We met our deployment conditions despite significant, prolonged technology limitations. In 2017, we successfully deployed a new TDD LTE network and rolled out a commercial fixed WTTT service to select rural communities. A more extensive deployment began in 2018 and our current plan is to accelerate this further in 2019 and beyond. Our ability to deliver this service as well as 5G mobile services in the future, depends on having access to sufficient spectrum in the 3500 MHz spectrum band. While the Department considers that incumbent licensees will be able to

continue providing fixed services after a portion of their spectrum is returned, this is entirely dependent on the amount of spectrum that must be returned. It is far from certain that current services and service levels will be maintained. In addition, the Department's stated rationale for forcing the return of spectrum is to ensure that sufficient spectrum will be available for new 5G services. However, existing licensees are capable of developing and introducing 5G services with our current allotments.

37. A forced return of spectrum would discourage future investment and innovation in the industry as licensees would always be concerned that their licences could be appropriated by the Government at any time simply because demand for the spectrum had increased. Such an outcome would be completely contrary to the Government's policy objectives.

38. It is also unclear whether the Department has taken into account the particular circumstances of the Inukshuk Wireless Partnership. For the purpose of establishing the amount of spectrum that existing licensees must return to the Department, and consistent with the Department's past practice, Bell and Rogers should be treated as if they are two independent licensees rather than one partnership. This means that the calculation of spectrum holdings should be based on each partner's individual interest in the partnership. As discussed further below, treating Inukshuk Wireless Partnership as if they are two licensees is consistent with general partnership law, the treatment of partnerships by other Canadian regulators and statutes, and how the partnership is treated under generally accepted accounting principles.

39. If, despite the numerous policy reasons to the contrary, the Department requires existing licence holders to return a portion of their spectrum, the amount returned should be no greater than one-third of their spectrum holdings. While there is a precedent that supports requiring no spectrum to be returned, there is no relevant example of the Department requiring the return of more than one-third of a licensees' holdings.

3.2.1 Development of the 3500 MHz spectrum band

40. The 3500 MHz band has had a challenging history. For years, deployment in the band was constrained by the lack of a technologically mature and economically viable equipment ecosystem. The Department recognized these roadblocks and twice extended the deployment requirements as a result. As the Department noted in its *Consultation on Renewal Process for 2300 MHz and 3500 MHz Licences*:

In July 2009, Industry Canada issued a letter to licensees that **recognized the extenuating circumstances affecting deployment plans** and granted all 2300 MHz and 3500 MHz licensees an extension to the deployment condition until the end of year eight of their licence term.¹⁸ (Emphasis added)

In early 2012, Industry Canada received several requests from licensees in the 2300 MHz and 3500 MHz bands for a further extension to the implementation requirement ... **After reviewing the requests, Industry Canada decided to extend the deadline to the end of each licence's 10-year term...**¹⁹ (Emphasis added)

41. As spectrum holders in the 3500 MHz band through our Inukshuk Wireless Partnership with Rogers, we have remained fully compliant with the deployment conditions of our licences despite the technological obstacles of doing so. Our investments have largely been stranded for more than a decade and it has been difficult to achieve any return on the capital we have invested for many years.

42. More recently, technological advancements have permitted us to deploy a new TDD LTE network using 3500 MHz spectrum. With this network, we have successfully rolled out a new commercial fixed WTTH service to several rural communities, beginning with Orangeville, Feversham and Bethany in 2017.²⁰ Our WTTH service is an innovative alternative in rural communities that are unserved or underserved by wireline broadband. A more extensive deployment began in 2018 and our current plan is to accelerate this further in 2019 and beyond.

43. We view the TDD LTE network we are using for WTTH to be a precursor to a 5G network, which we can begin to deploy as soon as we are granted flexible use access to the band. With our planned deployment, the benefits of 5G will not be limited to urban areas, but will also result in innovations and enhancements to the fixed service we are currently providing to rural Canadians. Our long-term ability to deliver these services depends on having access to sufficient spectrum in the 3500 MHz spectrum band. The more 3500 MHz spectrum that must be returned to the Department, the more rural customers will be negatively impacted.

¹⁸ Industry Canada, DGSO-006-12, *Consultation on Renewal Process for 2300 MHz and 3500 MHz Licences*, October 2012, paragraph 16.

¹⁹ Industry Canada, DGSO-006-12, paragraphs 17 and 20.

²⁰ "Huawei enables Bell Canada's Wireless to the Home (WTTH) trials that put Canadian rural customers on the path to 5G," 27 February 2018. <https://www.newswire.ca/news-releases/huawei-enables-bell-canadas-wireless-to-the-home-wtth-trials-that-put-canadian-rural-customers-on-the-path-to-5g-675262803.html>.

3.2.2 Inukshuk Wireless Partnership: Spectrum holdings should be calculated based on each partner's individual interest

44. With regard to the amount of spectrum that current licensees are expected to return, it is unclear whether the Department has taken into account the particular circumstances of the Inukshuk Wireless Partnership.²¹ Paragraph 46 of the Consultation states that "[c]alculations will be based on the spectrum holdings as of the date of this publication", and "[a]ny subsequent licence transfers or divisions of a licence by area and/or frequency will not alter the total amount of spectrum available to incumbents for flexible use". This could be interpreted as an intention to treat the Inukshuk Wireless Partnership as a single licensee rather than as two licensees, although it seems unlikely that this would be the Department's intent.

45. If the Inukshuk Wireless Partnership is treated as a single licensee, as paragraph 46 of the Consultation seems to suggest, then under return of spectrum Option 2, Bell and Rogers would be uniquely and unfairly penalized.²² For example, if the Inukshuk Wireless Partnership has 100 MHz of spectrum and is treated as a single licensee, then under Option 2, the Inukshuk Wireless Partnership would retain 50 MHz of spectrum when the new flexible use licences are issued and Bell and Rogers would each retain 25 MHz of spectrum. If, on the other hand, the Inukshuk Wireless Partnership has 100 MHz of spectrum and is treated as if there were two licensees based on each Partner's interest in the partnership, then Bell and Rogers would each retain 50 MHz of spectrum under Option 2 when the new flexible use licences are issued.

46. Consider, for example, the area of La Tuque, Quebec, where the Inukshuk Wireless Partnership currently has a licence for 100 MHz of 3500 MHz spectrum, Xplornet has 50 MHz and Broadpoint has 25 MHz. If the Inukshuk Wireless Partnership is treated as if there were two licensees based on each partner's interest in the partnership for the purpose of calculating the amount of spectrum to return, then we would retain 50 MHz of spectrum and Rogers would retain 50 MHz of spectrum – the same amount as Xplornet in this area.

47. Now suppose that the Inukshuk Wireless Partnership is treated as a single licensee and Option 2 is applied such that any licensee that holds 50 MHz of spectrum or more would be licensed for 50 MHz, and all other licensees would be licensed for 20 MHz. Upon the issuance

²¹ Inukshuk Wireless Partnership is a 50/50 partnership between Bell Canada and Rogers Communications Inc. Inukshuk Wireless Partnership holds the Partners' 3500 MHz spectrum licences.

²² Note that this issue only arises if the Department adopts the proposed Option 2. However, as discussed below, adopting either Option 1 or Option 2 would be poor public policy which will discourage innovation and investment.

of flexible use licences, Inukshuk Wireless Partnership would retain 50 MHz of spectrum, Xplornet would retain 50 MHz of spectrum and Broadpoint would retain 20 MHz of spectrum. As a result, Bell and Rogers would each be required to return 25 MHz of spectrum, leaving each with 25 MHz (i.e., 50 MHz divided by two), Broadpoint would have to return 5 MHz, and Xplornet would not be required to return any spectrum. Clearly, if paragraph 46 of the Consultation is interpreted as the Inukshuk Wireless Partnership being treated as a single licensee, the outcome would be punitive to Bell and Rogers.

48. On several occasions, the Department has recognized that Bell and Rogers each have access to 50% of the Inukshuk Wireless Partnership's spectrum licences and implemented regulatory decisions as if the licences were held independently by Bell and Rogers. For example:

- On 27 February 2014, the Department denied the transfer of spectrum licences from NextWave to Inukshuk Wireless Partnership.²³ The Department's rationale was that "if the transfer was approved, it would represent a significant shift in spectrum concentration in the WCS band", since "Bell and Rogers, through Inukshuk, would increase their combined WCS spectrum holdings from 29 percent to 77 percent".
- On 15 January 2015 the Department approved the transfer of spectrum licences held by Inukshuk Wireless Partnership to Bell Mobility Inc.²⁴ The Department stated "that Inukshuk is a partnership between Bell and Rogers Communications Partnership, with each owning a 50% partnership interest", and "as the Licences would continue to be controlled by Bell post-transfer, the transfer will not result in any change in spectrum concentration".
- Also on 15 January 2015, the Department approved the transfer of spectrum licences held by Inukshuk Wireless Partnership to Rogers Communications Partnership.²⁵ Again the Department stated "that Inukshuk is a partnership between Rogers and Bell Mobility Inc., with each owning a 50% partnership

²³ Transfer of Spectrum Licences Held by 4253311 Canada Inc. (NextWave) to Inukshuk Wireless Partnership (Inukshuk), February 27, 2014, paragraph 6. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10762.html>.

²⁴ Transfer of Spectrum Licences Held by Inukshuk Wireless Partnership (Inukshuk) to Rogers Communications Partnership (Rogers), January 15, 2015, paragraph 6. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10922.html>.

²⁵ Transfer of Spectrum Licences Held by Inukshuk Wireless Partnership (Inukshuk) to Rogers Communications Partnership (Rogers), January 15, 2015, paragraph 6. Available at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10923.html>.

interest", and "as the Licences would continue to be controlled by Rogers post-transfer, the transfer will not result in any change in spectrum concentration".

49. As the above examples show, the Department's track record of treating Inukshuk Wireless Partnership as two separate partners has established a precedent for how Inukshuk Wireless Partnership should be treated in terms of 3500 MHz spectrum policy. Specifically, for the purpose of establishing the amount of spectrum that existing licensees must return to the Department, and consistent with the Department's past practice, the calculation of Bell's and Rogers' spectrum holdings should be based on their interest in the Inukshuk Wireless Partnership which implies that we are treated as if we are two independent licensees.

50. Treating Inukshuk Wireless Partnership as if the licences were being held by Bell and Rogers is consistent with general partnership law, the treatment of partnerships by other Canadian regulators and statutes, and how the partnership is treated under generally accepted accounting principles. A legal opinion prepared by Goodmans LLP in the attached Appendix and concludes:

- "Under well-established general principles of Canadian partnership law, the Partnership is not a distinct legal entity capable of owning property such as the Licences. Instead, each Partner holds an undivided proportional ownership interest in the Partnership's property, including the Licences, corresponding to such Partner's percentage interest in the Partnership."²⁶
- "While the Licences granted by ISED are recorded in the name of the Partnership, ISED has previously: (i) acknowledged that spectrum licences recorded in the name of the Partnership are currently controlled by the Partners; and (ii) looked through the Partnership and treated the licences as being held by the Partners, being Bell and Rogers. This treatment is consistent with the general principles of partnership law."²⁷
- "The proposed treatment is most consistent with the treatment of: (i) partnership property under general principles of partnership law; (ii) partnerships and licences by ISED, the CRTC, other Canadian regulators and pursuant to various statutes; (iii) each Partner's interest in the Licences under certain provisions of

²⁶ Goodmans LLP, "Legal Treatment of Spectrum Licences Recorded in the Name of Inukshuk Wireless Partnership", page 2.

²⁷ Ibid.

the Partnership Agreement; and (iv) Bell's interest in the Partnership for financial statement purposes under Canadian generally accepted accounting principles."²⁸

51. Thus, the Goodmans LLP's opinion concludes that "in its implementation of the options proposed in the Consultation, ISED should treat the Licences in a manner consistent with general principles of Canadian partnership law and ISED's historical treatment of the Licences. To apply this treatment, ISED should determine any reduction of existing spectrum or future spectrum allocation on a Licence-by-Licence basis, calculated for each Partner based on its undivided proportional interest in each Licence corresponding to such Partner's percentage ownership interest in the Partnership."²⁹

3.2.3 Requiring existing licensees to return the spectrum is poor public policy

52. The Minister of ISED has expressed the centrality of innovation to the Department's mandate, stating his intention to "transform Canada's economy into an innovation economy".³⁰ The Prime Minister has similarly stressed the importance of innovation, and, in his mandate letter to the Minister of ISED, directed him to develop an "Innovation Agenda" and to "foster a strong investment environment for telecommunications services to keep Canada at the leading edge of the digital economy" as two of his top priorities.³¹ In order to preserve Canada's "strong investment environment" and continue to encourage innovation, it is crucial that licence holders are able to use spectrum they have acquired and deployed in good faith.

53. Internationally, regulators are moving to make spectrum from 3300-4200 MHz available for flexible use to facilitate the deployment of 5G. As noted in the Consultation, multiple countries including the United States, the United Kingdom, Ireland, Japan, China, Singapore and Australia have already made or announced plans to make 3500 MHz spectrum available for commercial mobile or flexible use. Mobile operators in these jurisdictions will gain access to this spectrum as early as this year.³² Although the Department only proposes to convert spectrum up to 3650 MHz in its initial transition process, other nations have committed to releasing spectrum up to 3800 MHz in the near future. Falling behind internationally would place Canada

²⁸ Ibid.

²⁹ Ibid.

³⁰ ISED, "Budget 2018: Investing in Canada's innovators, scientists and researchers," 6 March 2018. Available at: <https://www.canada.ca/en/innovation-science-economic-development/news/2018/03/budget-2018-investing-in-canadas-innovators-scientists-and-researchers.html>.

³¹ Prime Minister of Canada, Minister of Innovation Science and Economic Development Mandate Letter, 12 November 2015. Available at: <https://pm.gc.ca/eng/minister-innovation-science-and-economic-development-mandate-letter>.

³² The Consultation, Section 5.

at a disadvantage and hamper the ability of carriers to provide Canadian consumers with world class mobile and fixed services.

54. Having fairly acquired 3500 MHz spectrum, we deployed it to the best of our ability given the challenges of the equipment ecosystem. Now that the technology has developed sufficiently to introduce viable wireless services into the market, it would be poor public policy for the Government to seize the spectrum and auction it off. Presumably, existing licensees would be required to repurchase spectrum in the auction; effectively paying for the same spectrum twice. A forced return of spectrum would discourage future investment and innovation in the industry as licensees would always be concerned that their licences could be appropriated by the Government at any time simply because demand for the spectrum had increased. Such an outcome would be completely contrary to the Government's policy objectives.

A mandatory return of spectrum contravenes the Government's auction policy

55. There is no precedent for the Government appropriating two-thirds of the spectrum held by existing licensees. In fact, doing so would be contrary to the *Framework for Spectrum Auctions in Canada*³³ (the *Auction Framework*). Section 3.2 of the *Auction Framework* states:

It is therefore important to note that pursuant to these regulations, Industry Canada would reallocate, or provide alternative access to spectrum licences assigned through auction, only under extraordinary circumstances (for example, where a change in international allocation or an overriding policy need arises), taking into consideration whether the licensee has complied with the conditions of licence, the level of investment made and the size of its established client base, and in the case of alternative access, the degree to which the existing use would continue unimpeded.³⁴

56. Transitioning the spectrum from fixed to flexible is not an extraordinary circumstance – the Department could announce this change today and existing licensees could begin to deploy their spectrum for fixed and mobile applications without any further process. In this regard, the situation with existing 3500 MHz licences is different than the situation with C-band spectrum. Specifically, satellite service providers cannot easily transition to becoming terrestrial service providers, and vice versa. As noted above, we have complied with the conditions of licence

³³ Industry Canada, *Framework for Spectrum Auctions in Canada*, March 2011. Available at: <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01626.html>.

³⁴ Industry Canada, *Framework for Spectrum Auctions in Canada*, March 2011, at page 3. It is also contrary to the spectrum auction framework in place when the licences were auctioned. See Industry Canada, *Framework for Spectrum Auctions in Canada*, October 2001, section 4.2.

(COLs), made large investments in infrastructure (with plans for considerably more investment in the near term) and have an established client base.

57. Forcing existing licensees to return two-thirds of the spectrum would also be contrary to section 3.5 of the *Auction Framework*, which states:

Licences issued via auction will have terms of up to 20 years, based on the specific spectrum being offered. Where spectrum use is not anticipated to change, longer terms (e.g. 20 years) would be offered. As a condition of licence, licences will have a high expectation of renewal, unless a breach of licence condition has occurred, a fundamental reallocation of spectrum to a new service is required or an overriding policy need arises.³⁵

58. Similarly, the licensing framework from the original 3500 MHz spectrum auction states:

The term of the licence will be ten years from the date of licence issuance, with an expectation to renew licences for subsequent ten-year terms unless a breach of licence condition occurs (e.g. failure to meet a reasonable level of service or implementation requirements as outlined in Section 6.13); a fundamental reallocation of spectrum to a new service is required (e.g. a change in international allocation); or, an overriding policy need arises (e.g. a spectrum reallocation to address a national security issue).³⁶

59. None of the conditions that would prevent a renewal for a further ten-year term are present in the current case. No breaches of licence have occurred, adding a flexible mobile allocation is not a profound change to the nature this band, and the policy need to enable 5G deployments can be accomplished more efficiently by leaving the spectrum in the hands of the current licence holders.

3.2.4 Existing licensees should retain at least two-thirds of their spectrum

60. If, despite the numerous policy reasons to the contrary, the Department requires existing licence holders to return a portion of their spectrum, the amount returned should be no greater than one-third of their spectrum holdings. As discussed further below, there is no relevant example of the Department requiring the return of more than one-third of a licensee's holdings and requiring more than one-third significantly reduces existing licence holders' spectrum

³⁵ Industry Canada, *Framework for Spectrum Auctions in Canada*, March 2011, at page 3. It is also contrary to the spectrum auction framework in place when the licences were auctioned. See Industry Canada, *Framework for Spectrum Auctions in Canada*, October 2001, section 4.5.

³⁶ Industry Canada, *Policy and Licensing Procedures for the Auction of Spectrum Licences in the 2300 MHz and 3500 MHz Bands*, September 2003, section 6.1. Available at: [https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/finalpolicy_e.pdf/\\$FILE/finalpolicy_e.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/finalpolicy_e.pdf/$FILE/finalpolicy_e.pdf).

capacity and threatens their ability to maintain the services they currently offer, as well as any future new services.

No precedent for seizing more than one-third of an existing licensees' spectrum holdings

61. A previous case where the Department granted mobile use of spectrum involved Mobile Satellite Services (MSS) spectrum. In 2010, the Department authorized Terrestrial to use MSS spectrum to provide terrestrial commercial mobile services as long as it was done in conjunction with the ongoing satellite service using the same spectrum.³⁷ This was done subsequent to an earlier decision by the Federal Communications Commission (FCC) in the United States on the basis of an application from Terrestrial. Although this authorization vastly increased the value of the MSS spectrum licensed, and there were additional potential licensees, the Department did not reduce the amount of licensed spectrum available to Terrestrial.

62. The sole relevant precedent we are aware of involving a requirement to return spectrum is the conversion of the 2500 MHz band in 2009 from fixed to flexible. At that time, the Department determined the "increased value associated with mobile spectrum" necessitated a partial return for existing licensees wishing to convert their licences.³⁸ The Department also cited the potential for increased spectral efficiency and the added regulatory flexibility as justification for re-assessing the licensing requirements. Furthermore, the Department indicated that "there is an overriding policy need to accommodate the introduction of new services".³⁹ However, the Department only required the return of one-third of spectrum holdings.

63. To our knowledge, a requirement that existing licensees must return the majority of their spectrum in order to be granted mobile use is unprecedented. In fact, the Department has previously granted mobile use freely with no reduction of spectrum holdings. Thus, the Department should align with its past practice on this issue and reduce spectrum holdings by no more than one-third.

³⁷ Industry Canada, *MSS-ATC Special Authorization Issued to TerreStar Solutions Inc.*, 19 July 2010. Available at: <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09928.html>.

³⁸ Industry Canada, DGTP-002-06 - *Policy Provisions for the Band 2500-2690 MHz to Facilitate Future Mobile Service*, 30 March 2006. Available at: <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08551.html>. We are not aware of any Departmental policy which compels, or permits, the seizure of licensed spectrum because its value has increased over time. Indeed, if such a policy existed, it could be argued that the Government should compensate licensees for spectrum that becomes less valuable during the term of the licence.

³⁹ *Ibid.*

Existing licensees require sufficient spectrum to continue providing services

64. Seizing more than one-third of licence holders' spectrum would negatively impact the availability and performance of high-speed broadband in rural communities. Rural broadband availability is clearly a priority for the Government, having recently committed \$500 million in funding to the "Connect to Innovate" program.⁴⁰ Given the importance of this issue, the Department should not now undermine the ability of existing licence holders to provide these services. Without sufficient spectrum, our good faith investments in using this spectrum for rural broadband will be undermined.

65. The Department should consider that other wireless service providers, besides current primary licence holders, will also be impacted by a requirement to return spectrum. For example, Corridor Communications Inc. (CCI), who subordinates spectrum from Bell and Rogers through the Inukshuk Wireless Partnership, operates primarily in rural Alberta with a large number of subscribers. CCI will likely be negatively affected due to a reduction in spectrum holdings.

66. Beyond serving our fixed wireless customers, our existing TDD LTE network will also serve as the backbone for a rapid deployment of 5G services. In order to maintain current service standards for our fixed wireless customers and achieve the Department's objective of deploying 5G in a timely manner, existing licence holders must retain at least two-thirds of their current holdings.

A return of one-third of currently licensed spectrum would support the Department's objectives

67. The Department states that it wishes to implement a spectrum return policy in the interest of supporting competition and innovation.⁴¹ Permitting existing licence holders to keep two-thirds of their spectrum would contribute toward achieving this goal. A rule that allows existing licensees to keep two-thirds of their current holdings would leave between 80 MHz and 200 MHz of spectrum in 3450-3650 MHz range, with the vast majority of regions having between 80 MHz to 90 MHz available. This would be a sufficient amount of spectrum to allow other operators access to the band.

⁴⁰ Government of Canada, *Connect to Innovate*, <https://www.canada.ca/en/innovation-science-economic-development/programs/computer-internet-access/connect-to-innovate.html>.

⁴¹ The Consultation, paragraph 40.

68. Permitting existing licence holders to keep two-thirds of their spectrum would also support competition. Existing licensees would be able to continue to provide services to their customers, and there would still be enough spectrum for the Department to allocate in an auction which would allow new operators access to spectrum.

69. In summary, we urge the Department to abide by its own policies and precedents and allow current licensees to retain their spectrum allotments when converting to flexible use. Not only would this be consistent with past and current spectrum auction frameworks, it would encourage investment and innovation and accelerate the deployment of 5G networks. Requiring a return of spectrum beyond one-third is completely without precedent, and would deteriorate the service provided to our WTTW customers and our ability to deploy 5G technologies. Regardless of how much spectrum the Department elects to seize, it must do so fairly and equally to all existing licensees. This necessitates calculating spectrum holdings based on each Partner's individual interest in the partnership.

3.3 Band Plan and Licensing Considerations

Q7. ISED is seeking comments on a revised band plan using unpaired blocks of 10 MHz in the frequency range of 3450–3650 MHz.

70. Reorganizing the band plan into 10 MHz unpaired blocks will provide the necessary flexibility for providers to aggregate blocks in an efficient manner that suits their desired network deployment. However, without knowing what the final amount of spectrum existing licensees will hold, it is difficult to definitively determine the optimal size of the unpaired blocks.

Q8. ISED is seeking comments on whether any additional measures should be taken to limit potential interference issues with the proposed TDD band plan.

71. As noted above, the band will require synchronization in order to limit interference issues. Synchronization does not only refer to sharing a common clock signal, but also employing the same uplink/downlink ratio across the band. This will involve significant coordination between all adjacent operators (adjacent in both frequency and geography). The more operators involved and the more fragmented the spectrum or licence areas, the more complex this task becomes. Despite the challenges, synchronization is preferable to other methods of limiting interference, such as implementing guard bands.

Q10. ISED is seeking preliminary comments on the importance of price discovery in a licensing process for flexible use licences in the 3500 MHz band.

72. The primary objective of auctions is efficiency, or assigning the spectrum to those that value it the most. The most efficient auction design maximizes openness (which we define as transparency and the discovery of information about valuations⁴²) and minimizes administrative burden (which we define by complexity and resource costs from both the Department's perspective and the bidders⁴³). By their very design, sealed-bid auctions are not open. In sealed-bid auctions, there is no opportunity for the price discovery process that occurs in ascending-bid auction formats such as combinatorial clock auctions (CCA) and simultaneous multiple-round ascending auctions (SMRA).

73. The efficiency benefits of price/value discovery that occur through an open bid process (i.e., not a sealed-bid process) was recognized by the Department when it noted that "both CCA and SMRA formats provide stakeholders with the benefit of price discovery through the multiple rounds".⁴⁴ The efficiency benefits of open, ascending-bid auctions have also been highlighted by Peter Cramton, a leading spectrum auction design expert:

An essential advantage of open bidding is that the bidding process reveals information about valuations. This information promotes the efficient assignment of licences, since bidders can condition their bids on more information. Moreover, to the extent that bidder values are affiliated, it raises auction revenues ... since the winner's curse is reduced. Bidders are able to bid more aggressively in an open auction, since they have better information about the item's value.⁴⁵

74. While inefficient allocations can be corrected after the auction through transactions in the secondary market, these transactions create significant resource costs to both the licence holders and the Department. For example, licence holders will be required to negotiate with each other to determine potential spectrum trades, and if a successful trade is negotiated, the parties involved will be required to submit the proposed transfer to the Department for approval. Therefore, price discovery is required to support the efficient allocation of flexible use licences in

⁴² Cramton, P., (2002), "Spectrum Auctions" *Handbook of Telecommunications Economics*, Vol. 1, Cave, Majumdar and Vogelsang, (eds.), Elsevier, 605-639, page 609, notes that information about valuations promotes the efficient assignment of licences.

⁴³ The more complex and resource intensive the auction format, the less straightforward and transparent the auction will be, and the more likely that bidders will make mistakes and/or develop inefficient bidding strategies.

⁴⁴ ISED, SLPB-003-17 *Consultation on a Licensing Framework for Residual Spectrum in the 700 MHz, 2500 MHz, 2300 MHz, PCS and 1670-1675 MHz Bands*, paragraph 29.

⁴⁵ Cramton, P., (1997) "The FCC Spectrum Auctions: An Early Assessment", *Journal of Economics and Management Strategy*, 6(3): 431-495, at page 435.

the 3500 MHz band and we recommend that the Department incorporate it into the licensing process.

Q9. ISED is seeking comments on the proposal to align the timing of the issuance of flexible use licences to incumbents with the issuance of licences to those who acquire 3500 MHz flexible use licences in a future licensing process.

Q11. ISED is seeking comments on the proposed protection and notification provisions for incumbent licensees as outlined below.

Protection period:

For Tier 4 service areas that include a population centre of 30,000 people or more:

- a minimum protection period of 6 months for sites within [large urban population centres](#) and the 10 km buffer zone surrounding those centres
- a minimum protection period of 2 years for all other sites

For all Tier 4 service areas that include a population centre of less than 30,000 people, a minimum protection period of 3 years

Notification period:

- a minimum notification period of 6 months in [large urban population centres](#) and in the 10 km buffer zone surrounding those centres
- a minimum notification period of 1 year in all other areas

Q12. ISED is seeking comments on alternative transition plans, or variations to the times proposed. Respondents are asked to provide a rationale for any alternative proposals.

75. We do not object at this time, to the proposed timing of the issuance of flexible use licences to existing licence holders, or the proposed protection and notification provisions included in the transition plan.

76. In addition to the measures outlined in the transition plan, we encourage the Department to facilitate discussions between licence holders as part of the transition process. During the conversion of the 2500 MHz band, the Department initiated a Stakeholder Proposal Development process, hosting discussions between all existing licence holders to develop a plan to align the spectrum that they would retain following the band transition, as well as discuss the timing of the transition and any new technical parameters. This process resulted in a unanimous proposal for a new band plan that the Department ultimately adopted. As the Department acknowledged at the time, "frequency planning and the details of implementation

have a significant impact on the usability and value of the spectrum"⁴⁶, and therefore existing licensees' views should be central to determining a transition policy.

77. These discussions are particularly important given the need for large amounts of contiguous spectrum to maximize the benefits of 5G systems and meet user demands. It is imperative that existing licence holders who win spectrum at auction and wish to deploy 5G networks obtain contiguous spectrum (including with existing licence holdings in the 3500 MHz spectrum band), and aligns spectrum holdings across licence areas where possible.

Q13. ISED is seeking comments on whether the fixed and mobile equipment for LTE and 5G technologies will be able to operate with intermittent interference from radars, including cross-border interference, within the 3450–3650 MHz band and in adjacent bands.

78. The existence of interference is never desirable, and particularly in this context may impact operators' ability to deliver services through network slicing. Nonetheless, incumbent mobile operators have extensive experience with cross-border interference, and we expect that we will be able to manage any issues through synchronization and antenna redirection. The beam-forming capabilities of 5G radios will improve the effectiveness of the latter technique.

4.0 THE 3800 MHz BAND

Q14. ISED is seeking preliminary comments on how to optimize the use of the 3650-3700 MHz band, including the potential use of a database access model.

79. The term "database access model" is not entirely clear. If it refers to a CBRS-type system in the Wireless Broadband Services (WBS) band, then we would strongly disagree with its implementation. CBRS is wholly unsuitable for application in Canada, and we encourage the Department to reject the adoption of similar approaches. If, on the other hand, the Department is simply referring to a database which can help mitigate interference issues, we do not have the same concerns.

⁴⁶ ISED, DGRB-005-09 - *Consultation on Transition to Broadband Radio Service (BRS) in the Band 2500–2690 MHz*, March 2009, Section 8. Available at: <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09300.html>.

Q15. ISED is seeking comments on the importance of the 3700–4200 MHz band to future FSS operations.

80. C-band spectrum will be important for 5G deployment internationally. Analysts have identified it as "one of the few spectral bands on which the global telco industry is converging, due to the abundance of available spectrum and its relatively favorable propagation characteristics, especially when compared with mmWave".⁴⁷

81. As noted above, the demand for FSS C-band is declining. The Department should follow other international jurisdictions and make this spectrum available for flexible use. While the needs of remaining FSS C-band users should be carefully considered, the importance of 3700-4200 MHz to the deployment of future 5G services must take precedence.

82. Given that the 3800 MHz ecosystem is expected to develop later than the one for 3500 MHz, it is our view that a mix of geographic and transition timing could maximize the ongoing utility of this spectrum. As a preliminary step, the Department should expand the 3500 MHz band to include 3700-3800 MHz and move existing FSS users to above 3800 MHz. The 3700-3800 MHz spectrum range is part of the n78 band and therefore will be developed at the same time as the rest of the 3500 MHz spectrum band intended for auction. This transition would free an additional 100 MHz of spectrum for flexible use right away while not placing undue pressure on the available bandwidth for FSS. In addition, exclusion zones, shielding, and/or potentially band pass filters could be used to make spectrum above 3800 MHz available sooner in more populated areas, as we discuss further below. Ultimately, however, the Department should plan to require FSS systems to relocate and be compressed into a smaller portion of the band with the objective of eventually vacating the band altogether.

Q16. ISED is seeking comments on whether unlicensed operators in the 3700-4200 MHz band should be required to submit their technical parameters to ISED to assist in frequency management.

83. We support the proposal to require unlicensed operators to provide the Department with the technical parameters associated with their operations since it may help with the development of exclusion zones which would serve to maximize spectrum utilization in the band.

⁴⁷ RCR Wireless, "Is C-Band the next frontier for 5G spectrum?", 26 July 2017. Available at: <https://www.rcrwireless.com/20170726/opinion/20170726wirelessanalyst-angle-is-c-band-the-next-frontier-for-5g-spectrum-tag9>.

Q17. ISED is seeking comments on which steps Canada should take to optimize the use of the 3700–4200 MHz band in consideration of the current services being provided and the developing technologies that would permit the use of new services in this band (e.g. exclusion zones).

Q18. ISED is seeking comments on the challenges and considerations related to the coexistence of other services, such as mobile and/or fixed wireless access, in the 3700–4200 MHz band.

84. While the Department's first priority must be to ensure mobile operators have access to 3700-4200 MHz for 5G deployments, we believe that co-existence with FSS systems using transition timing and techniques such as geographical exclusion zones, shielding, and/or potentially band pass filters can potentially achieve this objective in the short term. As stated above, the Department should first allocate 3700-3800 MHz to flexible use and shift FSS users out of this frequency range. For spectrum above 3800 MHz, the use of exclusion zones, shielding, and/or potentially band pass filters could allow earlier access for flexible use since C-Band satellite usage is largely limited to rural areas and diminishes near the populated areas where 5G will first be deployed. This could maximize spectrum utilization in the band and allow for a natural shift to mobile use as more communities become connected by terrestrial facilities and satellite demand diminishes. Transition timing and geographical exclusion zones may be particularly important for Northern communities which generally rely more on services using C-Band spectrum. Thus, as part of any transition process, we recommend that the Department consider providing longer transition times in Northern communities if required.

85. The process of locating all sites requiring exclusion is important and the Department should proactively engage with users of C-band FSS systems. An open dialogue about the Department's plans and efforts to coordinate with all providers will ensure that interference is mitigated in the most efficient way possible. As noted above, this can be facilitated if the Department initiated a Stakeholder Proposal Development process. With the support from the Department, all existing licence holders can work towards developing a plan to align the spectrum that they would retain following the band transition, as well as discuss the timing of the transition, ways to mitigate interference and the requirement for dealing with any new technical parameters.

86. Any coexistence measures should be implemented on a temporary basis. The long term goal of the Department should be to transition all FSS systems out of the 3800 MHz band and make the spectrum available for flexible fixed and mobile use. However, as noted above, we recognize that significant costs could arise in moving FSS systems out of the 3800 MHz band, which is why we recommend that the Department compensate providers of FSS systems for their relocation costs (if required) from auction proceeds. This would facilitate more efficient and timely spectrum evolutions to the benefit of all Canadians, while reducing any associated negative impacts on existing licensees.

5.0 CONCLUSION

87. The 3500 MHz and 3800 MHz bands should be made available for flexible use for mobile and fixed services. Access to large blocks of contiguous spectrum for flexible use in these bands is a necessity, both to ensure the continued provision of fixed wireless in rural communities and for the full benefits of 5G technologies to be realized. The Department should also abide by its own past practice and not require any return of spectrum when converting licences to flexible use. If the Department implements its proposal to seize spectrum, it should do so judiciously, and ensuring that all existing licensees are treated fairly and equally.

88. In addition, the Department should go further than what is currently proposed, and allocate a total of 350 MHz in the 3400-3800 MHz band for flexible use at the time of the auction. The allocation of flexible use spectrum in these bands will put Canada at the forefront of commercial mobile network deployments, allowing Canadians to continue to benefit from cutting-edge wireless services and applications and ensuring Canada's mobile networks remain world-class.

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