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November 30, 2020

Via email: ic.spectrumauctions-encheresduspectre.ic@canada.ca

Chantal Davis
Director, Spectrum Regulatory Best Practices
Innovation, Science and Economic Development Canada
235 Queen Street East
Ottawa, Ontario K1A 0H5

Dear Ms. Davis,

Re: Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band (SLPB-002-20) – Rogers Reply Comments

Attached, please find Reply Comments from Rogers Communications Canada Inc. (Rogers) in response to *Canada Gazette*, Part I, September 12, 2020, *Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band* (SLPB-002-20). Rogers files these comments in reply to Comments filed by other parties and posted on the Innovation, Science and Economic Development Canada (ISED or the Department) website on November 2, 2020.

Rogers thanks the Department for the opportunity to provide input on this important issue.

Yours very truly,

Howard Slawner
Vice President – Regulatory Telecom
HS/pg

Attach.

Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band
SLPB-002-20

Reply Comments of
Rogers Communications Canada Inc.
November 30, 2020

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Executive Summary

E1. The consultation record shows that stakeholders continue to need greater clarity, along with some sense of certainty, about the timing and decisions coming out of this consultation. It is important not just for any future 3800 MHz licensing processes but, critically, also vital for the information to be available prior to the upcoming 3500 MHz auction. The 3300-4200 MHz mobile band, while likely only 3400-4000 MHz for the short term, must be viewed as a single terrestrial band, and not as a collection of sub-bands. The decisions Innovation, Science and Economic Development Canada (the Department) makes in the consultation – and any potential (in)decisions and lack of publication regarding any aspect – will significantly support or hinder Canadian 5th generation (5G) wireless deployments and mobile competition for decades to come.

E2. While the Department is primarily consulting on Technical and Policy issues, it must be acknowledged that these aspects of spectrum policy will help to determine the boundaries of future mobile competition policy. How the 3300-4200 MHz band is ultimately distributed between competing networks will determine the benefit of 5G to Canadian consumers and businesses, and the global competitiveness of our economy. This consultation will determine whether there can be a level-playing field, which can unleash intensive, facilities-based competition. The Department must ensure every wireless network has the ability to obtain a sufficient amount of contiguous spectrum (or can aggregate blocks effectively) to compete with one another and deliver the latest generation of wireless services to Canadians

E3. The Department must also focus on the end-result once all the auctions have been completed, thereby ensuring that all networks are in a position to vigorously compete in the wireless market long-term. A differentiated spectrum cap that allows for an equitable, though not necessarily equal, amount of spectrum is the best competition measure for Canada. This approach would allow joint networks to obtain greater amounts of spectrum than single-operator networks; however, they would be prevented from circumventing auction caps by bidding separately and then immediately combining their spectrum. This would ensure competition between the two national networks (Rogers and Bell-Telus), while also ensuring that regional carriers and rural operators can secure a critical mass of 5G spectrum. Auction competition will be preserved, ensuring government revenues, while also taking away well-capitalized regional carriers' pernicious incentives with set-asides to drive costs for national operators, which ultimately reduces the capital available for network investments. A well-designed, differentiated spectrum

cap policy would be a benefit for all Canadians, particularly the rural Canadians for whom the Department is working diligently to provide additional network capacity and coverage.

E4. Failure to define the right Technical and Policy Framework could lead to excessive spectrum fragmentation, which in turn could lead to a poor competitive environment, higher network costs and customer prices, and, most importantly, Canada falling behind its international peers in the deployment and benefits of 5G wireless technology. The Department should not rely on the uncertain hope that future technology solutions and market transactions will be able to correct for the failure to address assignment issues within the greater band upfront. Having an intelligent assignment and defragmentation policy for 3300-4200 MHz from the outset will provide infinitely greater benefits and the Department must provide guidance on how they will rationalize the entire 3300-4200 MHz band or, at a minimum, effectively reduce harmful fragmentation of holdings, prior to the 3500 MHz auction. We have proposed a number of options for defragmentation that will maximize network investment efficiency, which will benefit all Canadian consumers, especially rural Canadians that have the most to gain from last mile wireless connectivity. No single network should gain an undue benefit that is unintentionally created by the Department not setting an appropriate defragmentation policy.

E5. There are significant benefits from integrating the award of 3500 MHz and 3800 MHz spectrum, even if this leads to a short delay in the award of the 3500 MHz spectrum. However, if ISED maintains two separate awards, frequency assignment should be integrated across both awards so that winners have access to contiguous spectrum. If ISED considers the rules of the 3500 MHz award to be unchangeable, we have proposed a simple rule for frequency assignment for the 3800 MHz award that would ensure each operator's spectrum holdings across the two awards fall into at most two contiguous ranges that are reasonably close together. ISED must indicate its intended approach to limiting fragmentation prior to 3500 MHz award to allow bidders to understand their options when bidding. ISED must also indicate its plans for caps within the 3800 MHz award prior to the 3500 MHz award; otherwise bidders in the first award lack vital information needed to value spectrum.

E6. It is vitally important to emphasize that any and all decisions related to the Wireless Broadband Service (WBS) band in this consultation have associated costs. Should the Department ultimately adopt the poor policy decision of not moving WBS, many WBS operators will still need to update their networks and

end-user devices. While these direct, explicit costs may initially be less than moving WBS operators, the hidden, implicit costs to flexible use operators and the resulting drag on the Canadian economy will be much greater. As such, the Department must weigh all potential gains and trade-offs of the different options and select the best “net-net” policy for Canada.

E7. The optimal future location for the WBS band is 3400-3450 MHz, not the spectrum above 3900 MHz that is ideal for high-power cellular use and could allow the flexible use band to extend upwards long term. Not moving WBS will increase fragmentation risks and potentially provide an undue technical and financial advantage to a single network (whether single or jointly operated). Many WBS operators, however, can support a move to 3400-3450 MHz with the network and end-user equipment they have already deployed, which would facilitate a faster, more cost-effective transition, with all the attendant benefits to mobile competition. It would also fully align the Canadian and U.S. 3800 MHz bands, simplifying cross border coordination and harmonizing equipment ecosystems. Moving WBS to 3400-3450 MHz, along with updating the technical rules for the WBS band, will also ensure greater adjacent co-existence between all services operating within the broader 3300-4200 MHz band. It is clearly the best policy outcome when all factors are carefully weighed.

E8. For clarity, Rogers supports Telesat’s core proposal regarding the satellite industry gaining access to proceeds from the 3800 MHz auction, on the basis that that ISED will manage all aspects of the Technical Policy and Licensing Frameworks and processes with regard to the sale of spectrum in the 3800 MHz band. However, Rogers also continues to strongly recommend that the Department coordinate with the broader community of satellite operators that are active in Canada to ensure a timely clearance of the 3800 MHz spectrum, as the FCC has done in the United States. If Telesat and all other satellite operators in Canada are provided appropriate financial assistance, the U.S. C-band Clearing Schedule and allocations can be adopted and fully achieved in Canada. Providing satellite industry compensation, even if a one-time event, will also allow the Department to adopt an accelerated auction timeline for the 3700-3980 MHz allocation and provide certainty for the mobile industry with regard to frequency assignment.

E9. Rogers supports providing Telesat and all other satellite operators in Canada transition funding support to assist in clearing the spectrum in a timely manner. The upside of a quick, certain clearance and transition to flexible use cannot be understated. However, we remain concerned about certain technical aspects and

terrestrial competition issues in the proposal identified by Rogers and others in the consultation. As such we continue to recommend the Department not adopt the Telesat proposal as previously presented.

E10. The 3800 MHz consultation is an opportunity for the Department to foster both innovation and competition. To deliver on this opportunity, above all else this consultation process must result in certainty and clarity ahead of the 3500 MHz auction on a range of issues. Other jurisdictions may be ahead in early 5G spectrum awards, but this consultation offers the chance to set the conditions for Canadian facilities-based operators to exceed the global success they had in the 4G-era. To achieve this, the Department must implement policy solutions that address the various issues holistically and focus on creating the right downstream conditions for vigorous competition between networks with significant spectrum blocks that have contiguity both within and across the 3500 MHz and 3800 MHz sub-bands. Minimizing the impact of spectrum fragmentation and providing timely access is essential to supporting the next-generation wireless services that promise to enhance Canada’s efficiency, productivity, and competitiveness.

Introduction

1. Rogers Communications Canada Inc. (Rogers) welcomes the opportunity to reply to comments filed by other parties in response to *SLPB-002-20: Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band*[1] (the Consultation), posted on the Innovation, Science and Economic Development Canada (ISED or the Department) website on November 2, 2020.

2. After reviewing the comments provided by other parties, we remain of the view that the 3800 MHz Consultation (combined with a future licensing consultation) may be Canada's last, best chance to create effective mid-band spectrum policies that will ensure the success of competing facilities-based 5G mobile networks. Getting these policies right is crucial for the benefit of Canadian consumers, businesses, and the global competitiveness of our economy. The available C-band spectrum from 3300-4200 MHz offers an unprecedently large amount of bandwidth compared to previously awarded mobile spectrum bands. At the same time, its unique propagation characteristics will enable more densely configured radio access networks (RANs), providing an excellent blend of capacity and coverage. Fixed satellite service (FSS) C-band usage is continuing to decline in importance, particularly outside of the Far North, and the spectrum can be put to a much more valuable use for Canadians by reallocating it for (terrestrial) flexible use. These factors together make this a true "Goldilocks" band for mobile operators.

3. As we highlight in our comments, there are a number of critically important individual policy issues relating to the 3500 MHz and 3800 MHz spectrum bands, including:

    a. Providing certainty to operators regarding availability of spectrum across the entire band before award processes begin;

    b. Packaging spectrum within and (if necessary) across auctions in a way that minimizes the exposure of operators to winning fragmented spectrum blocks, unsuitable for optimal 5G deployment;

    c. Supporting competition by promoting a level playing field between operators of all types, both within the auction and downstream market);

[1] ISED, *SLPB-002-20: Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band* (Consultation); http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11401.html.

d. Facilitating a timely, efficient transition of spectrum from legacy services to mobile, and managing coexistence with adjacent services; and,

e. Enhancing rural connectivity, for the benefit of all Canadians.

4. All are important issues in their own right. Achieving the best policy outcome for any single issue, however, requires that it be understood in the context that they are all highly interdependent, as we are dealing with one band, 3300-4200 MHz. This is true even accepting that the usable portion in Canada will, for the time being, only be 3400-4000 MHz.

Certainty and Clarity

5. Given the number of inter-related issues, it is essential that the Department use its final response to this consultation to provide more clarity and certainty on each issue prior to the auction. Otherwise, potential participants in the 3500 MHz auction will lack the information they need to properly value the spectrum, and the efficiency of the 3500 MHz auction outcome may be compromised. A fundamental requirement for any successful spectrum auction is that bidders have a common understanding of the likely policy, regulatory and competition framework surrounding the spectrum they are bidding for and future linked bands. At the moment, how the 3500 MHz auction relates to the future 3800 MHz auction(s) is unclear in terms of (i) whether spectrum caps in the 3800 MHz auction will depend on acquisitions in the 3500 MHz auction; and, (ii) how frequency assignments across the two awards might be organized. Further, from the comments submitted, there still remains a wide gulf in understanding of the broader implications of many of the Consultation questions. This uncertainty must be swiftly addressed to allow 3500 MHz auction participants sufficient time to finalize business plans and properly value the spectrum.

6. While Rogers would like to have access to 3500 MHz spectrum as soon as is practical, we would rather there be a modest delay in the award than for ISED to proceed without resolving critical issues. If a delay is appropriate, the Department might also use the time to integrate the award of 3800 MHz into the 3500 MHz award, given that the spectrum is substitutable and available on similar timescales. We remain confident that ISED's existing auction design and software could quickly and reasonably easily be adapted to a larger auction. Nevertheless, if we must have two auctions, the key to success is that bidders in the first auction have a detailed understanding of the conditions for the second auction.

Mobile Competition Policy

7. Now is also the time to reset Canada's mobile competition policy. Over the past decade and a half, ISED has overseen the introduction of regional wireless-only new entrants and continued to provide them preferential treatment, even as they morphed into stable and well-capitalized, quad-play regional incumbents. They have amassed deep spectrum portfolios with holdings in numerous low and mid-bands while still possessing low customer/MHz utilization rates. The Department has created rules to ensure these companies obtain spectrum at or near auction reserve prices, having the Canadian taxpayer subsidize their operations while they build out their networks (primarily in large urban population centres). However, the Canadian mobile market is unlikely to support the entry of additional wireless-only providers. It is well past time that regional telecommunication conglomerates, who have demonstrated their collective capability to make spectrum bids of over a billion dollars, should be treated as "new entrants".

8. The unintentional consequences of set-asides have been to raise the cost of spectrum for the national carriers, which in turn has squeezed the capital available to Rogers to support our leading efforts to bring advanced new technologies like 5G to the Canadian market. National carriers provide service from coast to coast to coast, and for the vast majority of Canadian mobile consumers. Combined with some of the highest annual access fees in the world and delay in the introduction of a fixed fees regime that will help all carriers (national, regional, and rural) to enhance coverage and capacity, set-asides primarily serve to inflate spectrum costs for national carriers. Taken as a whole, the outcomes of the Department's spectrum policies appear to be at direct odds with the Department's (and Government's) goals of enhanced rural connectivity and consumer pricing. While the national carriers continue to drive the price per GB down and deliver outstanding value to Canadians through significant, ongoing network investments, the Department should not be enacting policies that result in higher network costs, costs ultimately borne by average Canadians.

9. If the main goal of a set-aside is to ensure regional carriers continue to have guaranteed access to spectrum, spectrum caps achieve the same outcome without the pernicious incentives for regional carriers to drive up spectrum prices for national carriers, nor do caps make the customers of national operators subsidize the shareholders of the regional competitors to bolster government auction revenues. To be effective though, any spectrum cap must not simply be an auction cap that allows individual operators to bid separately and then immediately circumvent the spirit of the spectrum cap by combining the spectrum in a single network.

10. A sensible cap for aggregate 3300-4200 MHz spectrum must be set for each network in upcoming auctions, and for any subsequent subordination requests. Both network capacity and speed of 5G networks are dependent upon spectrum holdings. If a network operator, including two carriers operating a single radio access network together, can get access to a disproportionate amount of spectrum, either directly or indirectly through sharing agreements, it could deny other established operators' sufficient spectrum to compete effectively with high quality 5G services. For clarity, Rogers does not suggest that two wireless carriers cannot share spectrum in a joint network – especially as in rural locations with challenging economics, sharing can be quite beneficial – simply that there needs to be the application of a spectrum cap at the network level, not the individual carrier level.

11. We recommend a differentiated spectrum cap as proposed by Rogers for the 3500 MHz auction. This would allow joint networks to access more spectrum than any single operator but not to the extent that it unduly benefits or harms either joint or single operator networks. Such a cap balances the needs of both national networks, as well as the regional and rural networks, ensuring access for all operators while still maintaining robust auction competition and generating significant revenues and fair value for Canadians.

12. Without the use of a well-designed spectrum cap applied to all holdings in 3300-4200 MHz, it is unlikely that Canada will be able to obtain the Department's desired outcome of effective competition between a sufficient number of networks with large, contiguous holdings that are equitable, but not necessarily equal. If the Department ultimately elects to adopt no competition measures for the 3800 MHz band or set-asides with no caps, along with no provisions for defragmentation, Rogers continues to believe it will result in one of two likely and undesirable outcomes:

    - In Alternative 1, all networks have small, fragmented holdings, with high deployment costs for everyone and no one able to provide a high quality 5G experience.

    - In Alternative 2, only one leading network has wide contiguous holdings and all others have small fragmented holdings, and competition is forever skewed.

13. Regardless whether we end up with Alternative 1 or 2, it would be Canadian mobile consumers and businesses, and the broader Canadian economy, that would be the real losers. Canada's 4G leadership would not be able to be replicated in the

emerging 5G world. No comments were provided that changes our views regarding these risks in the slightest.

Fragmentation / Defragmentation Issues

14. We must also continue to insist that the time to deal with fragmentation risks is now, prior to the 3500 MHz auction when all stakeholders have the same goal of less fragmentation. After the 3500 MHz auction and transition spectrum has been assigned, network asymmetries will start to be entrenched and some licensees may be less interested in defragmentation for anti-competitive reasons. The Department cannot expect the secondary market to deliver defragmentation nor should ISED rely on there eventually being technological “fixes” that will only result in very costly, marginal gains at best. Having an effective, efficient assignment policy that will eliminate or minimize fragmentation in the 3300-4200 MHz band from the outset will allow network operators to deliver the world-class connectivity that Canadians have come to enjoy and demand.

15. At a minimum, the Department must avoid excessive fragmentation of the 3300-4200 MHz band by awarding spectrum across several auctions that risks awarding multiple, small, non-contiguous blocks that are spread beyond an individual radio’s Instantaneous BandWidth (IBW). In our comments, we proposed three ways that a reasonable, efficient frequency assignment could be achieved for the benefit of all operators, particularly regional and rural operators. One of these proposals requires no changes whatsoever to ISED’s proposed rules for the 3500 MHz award and could be implemented very easily through a simple rule for frequency allocation in the 3800 MHz award. Even if the spectrum won across both auctions were not contiguous, our proposals would maximize the chances of operators receiving spectrum as two separate contiguous blocks within an overall 300 MHz IBW window. Thus, while not ideal, such an outcome would be an infinitely better spectrum management outcome, with all the attendant benefits for competition and Canadian consumers.

16. For clarity, should the Department ultimately adopt policy options that would fragment the band without clear options to defragment and provide one (or, at most, two) contiguous large blocks of spectrum, the results will be that it would remain challenging to deliver speeds of at least 50/10Mbps that the CRTC is looking for in suburban areas that are close to fibre backhaul but currently lack the density to support FTTH deployments. While 50 MHz of WBS spectrum is more than sufficient for rural operators with low customer densities, 50 MHz (or less) of exclusively licensed spectrum is not enough for a mobile network operator (MNO)

to connect the deep suburban and ex-urban areas at speeds urban and suburban consumers enjoy.

Wireless Broadband Service (WBS) Relocation

17. Rogers appreciates that the Department may remain uncertain on how best to deal with the WBS band. However, it is clear that the WBS decision will have significant costs regardless of the policy the Department ultimately adopts. While Option 1 may have less direct, visible costs, it will ultimately be costlier overall to the Canadian economy and be a significant drag on 5G network performance by fragmenting the band. Worse, leaving WBS users where they currently are and not adopting improved assignment rules could result in only a single network being able to deploy above and below utilizing a single radio, achieving a cost-advantage that cannot be matched. This could ultimately result in a permanent structural asymmetry between MNOs, weakening mobile competition and must be avoided for the benefit of Canadians.

18. The real question is whether to displace WBS to the top or the bottom of the band, not whether to move them at all. The right choice is to move WBS licensees to 3400-3450 MHz. This will provide WBS operators with access to a larger existing equipment ecosystem, which many operators can accommodate today with the equipment they have already deployed. It will also open up a path to expand the flexible use (mobile) part of the band upwards in the future, once it possible to move satellite use above 4000 MHz to other bands.

19. While it is possible that the band could expand downwards, that path forward for global ecosystems remains more unclear owing to the broader usage globally for radiolocation. While the U.S. has started a process investigating below 3550 MHz for sharing with incumbent federal and military users, the amount of restrictions could severely limit the release and usability of spectrum and the development of an ecosystem. Satellite usage on the other hand, outside of limited earth stations and gateways that can be protected where necessary, will continue to become less and less important in southern Canada as fibre transport continues to push deeper and deeper into rural and remote areas. The 3500 MHz and 3800 MHz bands will be used to connect more and more households. Where previously the economics did not work for last-mile wireline access technologies like high-speed coax and fibre, they will work for last-mile wireless access. Properly awarded in large, contiguous blocks to multiple facilities-based carriers deploying advanced 5G technologies, the 3300-4200 MHz band will be able to deliver speeds and quality of service not previously dreamed of in legacy wireless access technologies.

20. No single technology or policy lever is a silver bullet in closing the Digital Divide in a country as vast and sparsely populated as Canada, but the 3300-4200 MHz band can arm network operators with the necessary tools to take on the challenge. Access to infrastructure is also essential to support backhaul operations. ISED can increase competition by ensuring that any infrastructure and rights-of-way held by municipalities, hydro utilities, and local telephone companies are made available to all other competitors. The Department should also ensure access to urban real estate (municipal and private sector) for new 5G micro sites (poles, lamp posts, street furniture, etc.) is available. Fair and reasonable access to the public and private infrastructure is essential to the successful deployment of small cell technology required to support 5G and the Internet of Things (IoT).

Satellite Relocation Policy

21. In our comments, we made the case that the Department should take the lead in allocating all C-band spectrum, while providing appropriate financial support to all satellite operators, i.e., Telesat and all others currently operating in Canada, in order to facilitate timely clearance of the spectrum. The majority of submissions concur that Telesat's proposal could introduce significant uncertainty and confusion around when the 3800 MHz spectrum would become available. The lack of support from any other satellite operator or customer suggests that instead of making the spectrum available sooner, it would risk creating a process that may be tied up in litigation for years. Both terrestrial and satellite opponents also highlight its inconsistency with the Department's approach to the fundamental reallocation of other spectrum bands in past years.

22. Rogers supports providing Telesat and all other satellite operators in Canada transition funding support to assist in clearing the spectrum in a timely manner. However, we remain concerned about many technical aspects and terrestrial competition issues outlined by Rogers and others. For instance, the Telesat proposal would preclude a combined sale with spectrum in adjacent bands, resulting in up to four auctions, with at least four sub-bands across the greater 3300-4200 MHz band (e.g., 3500 MHz band; 3650-3700 MHz band; Telesat Private Auction band; and, Telesat-ISED Auction band). This would not be the optimal policy outcome, given the risks of highly fragmented and massively inefficient spectrum assignments. Further, private sales could unduly benefit Bell and Telus's joint network, which could create permanent spectrum asymmetries.

23. Telesat's proposal, as presented, does not appear to be optimal for Canadian wireless competition policy and the interests of Canadian consumers and businesses. Accordingly, it should not be adopted by the Department, and instead

remain an ISED-led transition and sale process. Nevertheless, if the Department were to ultimately adopt the proposal, nothing in the responses has changed our view that the terms of any sale process by Telesat must be fully aligned with allocation and competition policies regarding the overall 3300-4200 MHz band.

24. For clarity, Rogers supports Telesat's core proposal regarding gaining access to proceeds from the 3800 MHz auction (on this occasion to, support the satellite industry in Canada), on the basis that that ISED will manage all aspects of the Technical Policy and Licensing Frameworks and processes with regard to the sale of spectrum 3800 MHz band, and subject to the following specific conditions:

- It is ISED's sole decision as to whether and how the satellite operators (Telesat and all other satellite operators in Canada) are compensated;
- Any such compensation should be a one-time event;
- ISED should be fully responsible for all aspects of the auction Framework (auction design, rules, eligibility etc.) for the release of the C-band spectrum between 3700-3980 MHz and the remainder of the C-band from 4000-4200 MHz;
- ISED should be fully responsible for all aspects of auction Policy (set-asides, caps, clearing, timing, licence conditions, WBS band (re)allocation, etc.);
- The U.S. C-band Clearing Schedule and allocations be adopted;
- ISED adopts an accelerated auction timeline for the 3700-3980 MHz allocation (in the form of one or two sequential auctions), such that the satellite operators (Telesat and all other satellite operators in Canada) can be compensated and that there is certainty for the mobile industry with regard to frequency assignment; and,
- ISED provides clarity as to the WBS allocation at 3650-3700 MHz.

25. Furthermore, Rogers recommends that the Department coordinate with the broader community of satellite operators that are active in Canada to ensure a timely clearance of the 3800 MHz spectrum, as the FCC has done in the U.S. As the responses from Intelsat, SES, Eutelsat, and Telesat make clear, it is possible for satellite operators to clear C-Band frequencies so that spectrum can be freed up on the same timetable as the U.S., but there is a cost for them to do this. Rogers believes that it is in the interests of all Canadians that ISED steps in to ensure that all satellite operators operating in Canada have the appropriate financial assistance to vacate the spectrum in a timely manner. We are confident that Canada will recoup the cost of such payments many times over through the combination of revenues from the auction and enhanced economic activity from the earlier transition to a more productive 5G-enabled society.

26. Rogers stated its position on all of the issues raised in the Consultation in its comments of October 26, 2020. The rest of this reply is limited to comments on proposals made by other parties. Failure to address any specific issue raised by other parties should not be taken by the Department as Rogers' acquiescence with the position.

Rogers' Reply to Comments of Other Parties

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

27. There is general consensus amongst the mobile industry that while the n78 band is currently more mature, the n77 band ecosystem will be mature along the timelines proposed by the Department of December 2023, as they match the U.S. Phase 2 3800 MHz deployments. Shaw and Ecotel also highlight that the device ecosystem supporting n77 should be mature at that time, with numerous devices (including top-end devices) already supporting the Third Generation Partnership Project (3GPP) band.[2]

28. Although n77 (3300-4200 MHz) is specifically being introduced as a 5G New Radio (NR) band, it is important to highlight that the RAN equipment to support this range will also be able to transmit using 4G Long Term Evolution (LTE). This means that should the Department ultimately elect to displace WBS licensees from 3650-3700 MHz to the top of the 3800 MHz band (instead of the superior 3400-3450 MHz location proposed by Rogers and several other submissions), WBS operators using 4G LTE systems today will not need to (immediately) upgrade their core systems to 5G, as is suggested by some. While they will likely want to do so in the long-term to take advantage of all the feature gains of 5G NR over 4G LTE (e.g. ultra reliability, low latency, etc.), they can do so when it makes financial sense, according to their preferred timeframes and reflecting their individual circumstances.

29. As Rogers states in our comments, all of the above-mentioned band class plans (B42, B43, n77, and n78 or subsets of these band classes) use Time Division Duplex (TDD) technology, which is compatible with the intended use in Canada.

[2] Shaw Comments, para 79; Iristel Comments, para 10.

The Department should firmly reject any request to introduce Frequency Division Duplex (FDD) services anywhere in the 3800 MHz band, geographically or spectrally.[3] Canada already has had very negative first-hand experience in allowing FDD access systems in a band that globally ultimately adopted TDD technologies. Canada lacks the scale needed to drive an equipment ecosystem on its own and allowing proprietary FDD technologies risks polluting the entire band for no gains. The Department should take no steps to allow the introduction of FDD in the 3800 MHz band.

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

30. After reviewing all the submissions for the Consultation, the best policy direction remains that Department should make all efforts, including making the 3500 MHz and 3800 MHz bands contiguous, to allow operators greater chances of acquiring larger contiguous amounts of spectrum, or larger amounts in multiple, contiguous blocks that are sufficiently close that they can be aggregated using a single radio.

31. The national and regional mobile operators and mobile equipment manufacturers are generally aligned that although non-contiguous spectrum is supported in 3GPP, the technical and operational gains of contiguous spectrum makes it the

[3] Advanced Interactive Comments, para 3.

superior option. Even Shaw, who supports Option 1 and not moving WBS licensees, states:

> Although 3GPP specifications support carrier aggregation between non-contiguous blocks, contiguous blocks are preferred because they provide lower latency, require less signalling overhead, and are more spectrally efficient than non-contiguous blocks. Contiguous blocks may also allow more spectrum to be aggregated in total due to limitations on the number of component carriers that can be aggregated by any given device.[4]

32. The parties most dismissive of the benefits to be gained from contiguous spectrum are those with a vested interest in the introduction and operation of U.S. CBRS Band 48 (3550-3700 MHz) devices or licensing scheme in the Canadian market, such as Redline Communications or Federated Wireless, or companies that are current WBS licensees, like TekSavvy and Iristel.[5] However, none of these submissions provide any argument or evidence that counters the real technical and operational impediments that non-contiguous spectrum creates, which will ultimately result in higher network costs for the majority of Canadians.

33. As is discussed further below, Canada should not adopt a CBRS licensing regime within WBS, as there are no incumbent government and military users that require ongoing priority access as is the case in the U.S. While there will be some costs associated with displacing WBS from 3650-3700 MHz, those costs will be on a much smaller scale to the Canadian economy compared to the additional costs resulting from non-contiguous spectrum allocations for national and regional mobile operators serving most of Canada's population and coverage. For clarity, not moving WBS (i.e., Option 1) will still have significant costs to the Canadian economy; however, instead of smaller, direct costs for displacement, there will be larger, hidden inefficiency costs. Rogers again takes the opportunity to highlight that any displacement costs for WBS would be minimized if they were relocated to 3400-3450 MHz – a location that Bell and Nokia also support.[6] Regardless of where WBS is ultimately moved, the benefits of contiguous spectrum – including overall cost savings – for mobile operators across the 3500 MHz and 3800 MHz bands will mean it is the best policy outcome for Canada.

[4] Shaw Comments, para 81.
[5] Redline Communications Comments, pg 11; Federated Wireless Comments, pg 3-4; TekSavvy Comments, para A2a; Iristel Comments, para 15.
[6] Bell Comments, para 35-36; Nokia Comments, pg 3.

34. Several operators, such as Bell, Iristel, Quebecor, Shaw, and Telus identify the challenge of IBWs of radios, with different solutions being offered.[7] For example, Telus states that the IBW of current radios is 200 MHz and might increase to around 400 MHz, but the path is unclear.[8] Given this assumption, Telus believes that most operators will need two radios to cover two separate contiguous blocks of spectrum across the 3500 MHz and 3800 MHz "bands". However, this conflicts with our understanding of vendor roadmaps that the IBW in the near term will be 300 MHz, with some vendors targeting release of these radios in early 2021**.**

35. As such, there is scope for assigning frequencies above and below 3650 MHz such that even if operators receive spectrum in two contiguous blocks, there is the potential for these to fit within a 300 MHz IBW and avoid the additional cost of second radios. On this basis, we proposed that if there is a standalone award for the 3800 MHz band, frequencies should be assigned in the same order as the 3500 MHz auction. This would allow a simple rule-based frequency assignment in the second auction. (Note, the ideal solution is, as both Rogers and Telus propose, to hold a single auction for all spectrum, with the next best to reassign all frequencies following a second auction.)

36. Rogers' proposed approach works because there is 200 MHz at play in the first 3500 MHz award, and around 250 MHz in the second 3800 MHz award (depending on the ultimate band plan adopted by ISED), likely split between around four winners. Therefore, if winners from both auctions are allocated spectrum in the same order in the second auction as has been established by the frequency assignment stage in the first auction, they will very often receive both frequency blocks within an overall 300 MHz range. For example, a winner at the bottom of the 3500 MHz band who is also wins in the 3800 MHz award would automatically be assigned spectrum at the bottom of 3800 MHz band, with both blocks fitting within 300 MHz provided that not more than 100 MHz was won in the second award. Moving up the 3500 MHz band, other winners' positions would depend on the exact outcome, but there would still be a good chance of receiving both assignments within an overall 300 MHz range, especially for winners of smaller amounts of spectrum. Clearly, this would be further complicated in the event of a second 3800 MHz auction (i.e., three auctions in the 3300-4200 MHz band).

37. Displacing WBS users from 3650-3700 MHz (either to the bottom of the 3500 MHz band, as proposed by Rogers, Bell and Nokia, or the top of 3800 MHz band, as

[7] Bell Comments, para 33; Iristel Comments, para 14; Shaw Comments, para 80; Quebecor Comments, para 12-13; Telus Comments, para 28.
[8] Telus Comments, para 28.

proposed by ISED's Option 2) would assist this process, by avoiding separation of the frequencies allocated in the two auctions by the current WBS allocation. The benefits of moving WBS – and the significant disadvantages of not moving them from their current location – are discussed further below.

38. If our suggested rule for frequency assignment in the second auction were not adopted, and there were assignment stage bidding in both auctions instead, then this could result in a situation in which the winner of the highest frequencies in the first auction and the lowest frequencies in the second would *uniquely* have contiguous spectrum and would probably be the only winner with all spectrum within the IBW. In our view, this is not desirable as it would give one winner a significant advantage that could be detrimental to downstream competition. It would also unnecessarily raise costs across the industry, forcing all but possibly that one winner to install two radios.

39. Rogers is particularly concerned that Bell and Telus would be in an advantaged position to exploit such a situation, regardless of whether they bid separately or as a single entity. If they bid separately, they would secure four blocks of spectrum across the two auctions; by targeting higher frequencies in the first auction and low frequencies in the second, there is good chance that most, if not all, of these four blocks could be contiguous. Conversely, if they bid together, then by virtue of their combined customer numbers they may have the strongest valuation for the highest frequencies in the first auction and the lowest in the second. Combined with a joint balance sheet, this could result in the joint Bell and Telus ("Belus") network to *uniquely* have contiguous spectrum across both awards.

40. Such outcomes are clearly detrimental to competition and to consumers. However, they can be readily avoided through any of our three suggestions in our previous response, which ensure there is not a significant advantage uniquely available to just one operator. As noted above, one of the suggestions is readily implementable through use of a frequency assignment rule for the 3800 MHz auction and would require no changes to ISED's 3500 MHz proposal.

41. The Telus view about IBWs is not significantly different from Rogers, in that an increase in the IBW is expected, with Telus suggesting this might reach 400 MHz eventually. However, we consider that Telus's view that an initial IBW of 200 MHz will constrain the large majority of operators to two radios (in fact likely all but one, as we have seen above) is unduly pessimistic. Even if all operators were required to deploy two radios, the Bell and Telus joint network would still be unfairly advantaged since, unlike their competitors, they would jointly fund the two radios, making it much more economic for them compared to their competitors. In any

event, it is clear that the 3500 MHz auction alone will allocate spectrum spanning equal to or less than the current IBW, as there is only 200 MHz available. Therefore, the relevant issue for the Department to consider is what the IBW will be at the time the 3800 MHz spectrum comes into active use (i.e., December 2023 or later), not what the current IBW might be.

42. Even if there were uncertainty about how rapidly the IBW of n77 or n78 equipment might increase as the ecosystems mature, there is still great merit in Rogers' proposal to use a rule-based approach to frequency assignment for a second auction. If the IBW does not widen, our proposed approach would remove the risk of one network having a significant cost advantage if – uniquely amongst winners – held contiguous spectrum. If the IBW is around 300 MHz when spectrum in the second award is deployed, our proposal may also avoid costs of second radios for most networks, which is clearly beneficial for customers. In particular, rural Canadians will benefit from the ability of network operators to use more investment capital to expand network coverage instead of deploying multiple radios (where not strictly necessary). The increased economic activity, associated tax revenue, and benefits to rural Canadians will more than make up for the small amount of auction revenue the Department may forego from assignment round bidding in a second auction. Such a proposal is a win-win-win for Canadian consumers, the economy, and network operators.

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

43. Most participants, including mobile stakeholders, some satellite operators, and public safety and government organizations support the adoption of U.S.

equipment in the 3800 MHz band, with the aim of developing a common North American ecosystem that will minimize any cross-border coordination. While some comments call for the Department to align with the EU up to 3700 MHz, such as Bell and Shaw,[9] Rogers continues to recommend that Canada align with the U.S. for 3800 MHz on the basis that it will be using 3GPP band plan n77.

44. Rogers supports the explicit recommendation by Bell, Ericsson, RABC, and Telus (and implicit support from Xplornet and Nokia) to have a single RSS cover both the 3500 MHz and 3800 MHz bands.[10] This will allow network operators to continue to access both the EU ecosystem for the 3500 MHz and U.S. ecosystem for the 3800 MHz band but be able to operate harmonized with the U.S. 3800 MHz rules.

45. Rogers would like to take this opportunity to bring up to the attention of the Department recent developments on end device maximum allowed transmit power in the C-band.

46. As of June 22, 2020, the FCC authorized user equipment (UE) with an EIRP of +30 dBm in 3700-3980 MHz[11] and is proposing to adopt the same value in 3450-3550 MHz.[12] Rogers' understanding of the FCC view is that this will allow operators to take advantage of 3GPP standards support for UE power class 2 (+26 dBm), in addition to default power class 3 (+23 dBm)13 for bands n77 and n78. Rogers also understands that FCC view is that this level will futureproof potential use of power class 1.5 (+29 dBm) in bands n77 and n78.

47. Rogers is also aware that ECC is developing a new standard, ETSI EN 301 908-2514, which includes power class 2 (+26 dBm) for bands n77 and n78.

48. Based on the above global trends, Rogers strongly recommends the Department align the RSS-192 UE transmit power limit with the FCC EIRP limit of +30 dBm. This will allow Canadians better access to 5G broadband mobile services,

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[9] Bell Comments, para 37; Shaw Comments, para 84.
[10] Bell Comments, para 38; Ericsson Comments, pg 10; Telus Comments, para 34; RABC Comments, para 12; Xplornet Comments, para 4; Nokia Comments, pg 3.
[11] FCC, *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*; https://www.federalregister.gov/documents/2020/04/23/2020-05164/expanding-flexible-use-of-the-37-to-42-ghz-band#p-370.
[12] FCC, *Facilitating Shared Use in the 3100-3550 MHz Band*; https://www.federalregister.gov/documents/2020/10/21/2020-22529/facilitating-shared-use-in-the-3100-3550-mhz-band#p-54.
[13] Table 6.2.1-1 "UE Power Class" of 3GPP TS 38.101-1 "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone (Release 15)".
[14] ETSI, *Details of 'DEN/MSG-TFES-15-25' Work Item*; https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=54786.

supporting increased cell range and higher data speeds at lower cost in 3450-3650 MHz. Similarly, Rogers would recommend that the same value of +30 dBm be adopted for the frequency 3650-3980 MHz (i.e., the entire 3450-3980 MHz flexible use range).

49. The only parties to strongly call for the adoption of EU technical rules in the 3800 MHz band are Intelsat and TekSavvy.[15] The Department can safely reject these outlier positions. Intelsat states they believe more restrictive OOBE standards will be helpful to facilitate the deployment of earth stations; however, even in satellite-dependent areas, FSS C-Band usage will continue to decrease and more restrictive OOBE power levels will unduly constrain terrestrial flexible use deployments – depriving more people from modern 5G services. TekSavvy has very limited experience in building or operating facilities-based networks – especially mobile networks. Further, their view that a potential future EU ecosystem will become a global standard outside of the U.S. both fails to appreciate the size of the U.S. market and does not at all account for the proposed alignment of the U.S. and Canadian deployment timelines while the development of an E.U. ecosystem above 3800 MHz is currently unknown.

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.

50. There is near unanimous support for the Department's 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, including active support within the satellite community from companies such as Intelsat, SES, and Telesat.[16] Even parties that are not in full agreement, such as CBC/Radio-Canada, Corus, and the North American Broadcasters Association,[17] do not actively oppose this proposal.

[15] Intelsat Comments, pg 19; TekSavvy Comments, para A3b.
[16] Intelsat Comments, pg 19; SES Comments, pg 8; Telesat Comments, 36.
[17] CBC/Radio-Canada Comments, pg 4; Corus Comments, pg 3-4; North American Broadcasters Association Comments, pg 3.

51. Rogers also supports the proposals by Telus and Ericsson,[18] similar to our own, to also add primary mobile service in 4000-4200 MHz to assist with the longer-term goal of expanding flexible use across the entire 3300-4200 MHz band.

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

52. Nearly all commenters are aligned with Rogers and support the proposal to develop a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band.

53. However, the Department should strongly reject any proposals to introduce opportunistic access to exclusively licensed spectrum, such as those by Dynamic Spectrum Alliance and Federated Wireless.[19] Such a system was introduced in the U.S. to deal with their unique situation in the 3500 MHz band, which does not exist in Canada. Introducing an unproven technology and licensing regime into prime mobile spectrum risks the rollout of 5G services in Canada. Network operators that are looking for low/no-cost spectrum will be able to still avail themselves of the WBS band, ideally at 3400-3450 MHz, with traditional sharing and coordination mechanisms. Further, the Department has launched a 6 GHz Consultation that will likely address much of this demand by providing significant amounts of licence-exempt spectrum that will a support a wide variety of in-building, campus coverage, and industrial use cases.

Q6: Harmonization of FSS use

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.

54. Most consultation participants support the Department's proposal that no new FSS earth stations be authorized within 3700-4000 MHz and that new FSS earth stations be authorized only in 4000-4200 MHz. The Department should strongly

[18] Telus Comments, para 39, Ericsson Comments, pg 11.
[19] Dynamic Spectrum Alliance Comments, pg 5; Federated Wireless Comments, pg 4.

reject proposals by satellite operators to allow for new earth stations on a non-protected basis in 3700-4000 MHz in non-satellite dependent areas. From experience, even non-protected operations could result in material impacts to deployments – as 'incumbent' satellite operators or customers could still ultimately request protection or mitigation from new flexible use services deploying in the area. Even if not granted, the process would slow the deployment of advanced 5G services in non-satellite-dependent areas.

55. Rogers continues to strongly recommend that new FSS earth stations, to the greatest extent possible, should be limited to the 4100-4200 MHz portion of the range to facilitate future expansion of the flexible use band. Further, as we propose in our comments, all current FSS earth stations should eventually move into the 4000-4200 MHz band (4100-4200 MHz) or, ideally, into another spectrum band altogether. This view is not just shared by large national, operators like Rogers but also small ones; "CanWISP favours migration of all FSS stations, current and future, to 4000-4200MHz."[20] The complete displacement of FSS earth stations in the 3700-4000 MHz across the whole country, including in satellite-dependent areas, would assist in the expeditious development and deployment of new flexible use services that will become increasingly valuable for industrial and environmental applications in remote areas.

56. The Department should strongly reject Ecotel's proposal that a significant amount of spectrum be reserved for private networks.[21] If Ecotel desires access to low/no cost spectrum, they are able to access the WBS band or other licence-exempt or lightly licensed bands that the Department has made available. Further, the Department has proposed to make significant additional licence-exempt spectrum available in the 6 GHz band. If Ecotel wishes access to exclusively licensed mid-band spectrum, the Department will be making it available at auction on a Tier 4 basis. The Canadian taxpayer should not be financially responsible for providing a key input into Ecotel's business model.

Q7: Guard band between flexible use and FSS

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.

[20] CanWISP Comments, para A6.
[21] Ecotel Comments, para 58.

57. There is broad consensus amongst various industries' stakeholders on the use of a 20 MHz guard band between 3980-4000 MHz if full power licensed flexible use systems operate up to 3980 MHz.

58. Rogers continues to believe the best overall policy option would be to move WBS to 3400-3450 MHz and allow continued expansion of the flexible use band upwards as FSS C-Band usage continues to decline, with a 20 MHz guard band between full power flexible use operations and remaining C-Band FSS usage. However, we also again highlight that there is currently no guard band between WBS and FSS earth stations today. Should the Department ultimately move WBS to the top of the 3800 MHz band, with WBS restricted to low power operations there would be no need for a guard band. This decision alone would recover more than 20 MHz of spectrum for exclusively licensed full power flexible use spectrum in the 3800 MHz band. Under Option 2, Iristel also questions the need for a guard band since none exists today.[22]

59. The Department should reject proposals by Corus and CBC/Radio-Canada to increase the guard band and proposals by SES and Intelsat to increase the pfd limits.[23] No evidence is offered that counters the technical studies conducted by the FCC that show that FSS earth stations will receive adequate protection from full power flexible use operations 20 MHz away and with the FCC pfd limits. Increasing the guard band would be an inefficient use of spectrum when network designs and satellite filters can prevent potential interference. Again, if the Department ultimately selects the suboptimal policy of moving WBS to the top of the 3800 MHz band (as opposed to the optimal policy of moving WBS to below the 3500 MHz band), this alone would create a minimum 50 MHz guard band between full power operations and near-term satellite usage.

Q8: Maintaining FSS services in satellite-dependent areas

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.

[22] Iristel Comments, para 22.
[23] Corus Comments, pg 4-5; CBC/Radio-Canada Comments, pg 5; SES Comments, pg 9; Intelsat Comments, pg 21.

60. There is general support of the Department's proposals in Q8, along with submissions like Ericsson, Quebecor, Shaw, and Xplornet echoing Rogers' recommendation to better define satellite-dependant areas to only capture actual satellite-dependant areas.[24]

61. Telus and Xplornet both question whether Telesat's proposal means that the entire 3700-4200 MHz band is required even in satellite-dependent areas, while Toronto Police Services and Mobilexchange both call for FSS being restricted to 4000-4200 MHz.[25] Further, SES states they will support what their customers in northern Quebec want – whether that is to continue using the band for FSS or whether they would prefer to deploy 5G services on the same schedule as rest of Canada.[26] Rogers fully supports all efforts by the Department to migrate all FSS operations out of 3700-4000 MHz in all areas of Canada as rapidly as possible – including in satellite-dependent areas.

62. The Department should reject the proposals by Federated Wireless and Dynamic Spectrum Alliance to introduce dynamic sharing mechanisms in the 3800 MHz band.[27] While FSS should retain some access to C-band spectrum in the short term, satellite operations usage will be declining over time. Once earth stations are moved and satellite operations are repacked, the spectrum can be made available for exclusive flexible use licensing. Again, the Canadian spectrum environment is not the same as the U.S. situation where incumbent federal and military users are expected to use the CBRS spectrum sporadically for some time, perhaps perpetually, into the future. Further, satellite earth stations do not move, unlike military vehicles and ships with radar systems. With FSS C-band spectrum demand steadily declining over time, there is no need to risk polluting the band with unproven technology and licensing regimes to solve non-existent spectrum management problems.

[24] Ericsson Comments, pg 13; Quebecor Comments, para 28; Shaw Comments, para 89; Xplornet Comments, para 19.
[25] Telus Comments, para 49; Xplornet Comments, para 18; Toronto Police Services Comments, pg 16; Mobilexchange Comments, pg 12.
[26] SES Comments, pg 10.
[27] Federated Wireless Comments, pg 6; Dynamic Spectrum Alliance Comments, pg 6.

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

63. No evidence is provided that counters the findings of the CRTC and Department that, overall, the 3700-4200 MHz band is becoming less important to FSS operations, especially in southern Canada. This overall view is shared by satellite operators including, Eutelsat, Intelsat, and SES,[28] in addition to Telesat who proposes to reduce C-band FSS usage even further. Further, several commenters highlight that the Telesat proposal to repack all FSS operations to 4100-4200 MHz highlight that the Department's proposals to limit FSS to 4000-4200 MHz in non-satellite-dependent areas are imminently feasible. There is clearly no debate on this important issue. However, there is also broad agreement across industries stakeholders that at least some C-band spectrum will be required in northern Canada until Low Earth Orbit (LEO) and Mid Earth Orbit (MEO) satellite constellations using Ka- and Ku-bands are fully operational.

64. The outlier is Inmarsat, who states that they use C-band spectrum for MSS feeder links and TT&C purposes that are motivated by factors beyond those suggested in the question.[29] However, neither of these usages are particularly spectrally demanding and can easily be accommodated in the C-band spectrum that legacy FSS services will still have access to in the near to mid-term. Inmarsat's needs can clearly be met under the Department's proposals to reduce FSS usage outside of satellite-dependent areas to 200 MHz.

[28] Eutelsat Comments, para a9.1; Intelsat Comments, pg 22; SES Comments, pg 11.
[29] Inmarsat Comments, pg 3.

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.

65. Rogers agrees with the position of Telus and Iristel that ISED and various levels of government should continue to fund the extension of terrestrial broadband services to smaller and remote communities, including subsidized access to fibre transport to help reduce reliance on satellite technology in remote areas.[30] The Department's recent announcements on the Universal Broadband Fund will contribute to closing the Digital Divide. Further, the 3800 MHz band itself (3300-4200 MHz) will be an effective last-mile terrestrial access service that will help to enhance broadband connectivity in satellite-dependant areas.

66. Rogers is fully supportive of the deployment of a Canadian Public Safety Broadband Network (PSBN) to enhance of the safety and security of Canadians and Canada. However, the proposals of the PSBN Innovation Alliance[31] may not ultimately achieve the principles defined by the Temporary National Coordination Office, including the coverage, interoperability, sustainability, affordability, or efficient use of spectrum principles for Canada's PSBN. We continue to be active participants in the Government's ongoing public processes and look forward to future participation and collaboration with all public safety stakeholders.

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.

67. There is broad support amongst the terrestrial mobile and fixed wireless industries for the Department's proposal to remove the FSS allocation in 3500-3650 MHz band and suppressing Canadian footnote C20 in the CTFA.

[30] Telus Comments, para 56; Iristel Comments, para 27.
[31] PSBN Innovation Alliance Comments, para 33.

68. Intelsat and SES state a general disagreement with the proposal, identifying ongoing satellite usage in the band for maritime services.[32] Inmarsat more strongly recommends against the proposal, stating they intend to launch a new satellite "within the next few years, utilizing its currently authorized frequencies".[33] The Department should reject these positions and adopt its proposals, as satellite operators have known since 2003 that the earth stations were being grandfathered, which will be 20 years until 3800 MHz flexible use services are introduced under the Consultation's proposed timelines. The launch of a new satellite could push the grandfathered time period to more than 40 years and prevent the impacted flexible use licensees from using their spectrum for new and innovative services requiring wider coverage. Further, if Inmarsat already has plans to replace the current satellite within the next few years, now is the appropriate and efficient time to either change frequencies to within the 4000-4200 MHz range or another band. Further, Inmarsat should consider completely moving their current earth station away from the Montreal-area if no other services are currently supported from the location.

69. Mobilexchange, Toronto Police Services, and Telus all explicitly reject grandfathering, with TekSavvy and CanWISP calling for displacement by 2022.[34] Having the earth stations in operation for another 20 or more years will create future coordination challenges for new flexible use services in the Montreal-area, if not within Montreal itself. The expanded deployment of very high capacity fibre transport facilities in areas outside of Montreal over the past decade provides FSS operators with a readily available option for relocating FSS earth stations outside of this important market. We continue to recommend that the Department impose a firm end date on when all FSS earth stations would need to cease operations within the 3500-3650 MHz 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.

70. Similar to Q11, there is broad support amongst the terrestrial mobile and fixed wireless industries for the Department's proposal to remove the primary FSS allocation from 3650-3700 MHz and suppress Canadian footnote C33 in the CTFA,

[32] Intelsat Comments, pg 23; SES Comments, pg 13.
[33] Inmarsat Comments, pg 4.
[34] Mobilexchange Comments, pg 13; Toronto Police Services Comments, pg 17; Telus Comments, para 59-60; TekSavvy Comments, para A11; CanWISP Comments, pg 15.

with only Intelsat and Inmarsat not supporting.[35] As we highlight above, the Department should continue to repack all FSS operations in southern Canada into 4000-4200 MHz as quickly as possible so as not to unduly slow or constrain the deployment of 5G services in the 3800 MHz band.

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

71. There is broad consensus supporting the Department's proposals to establishing unpaired blocks of 10 MHz for the 3650-3700 MHz and 3700-3980 MHz bands, with several highlighting the ability to aggregate of multiple 10 MHz blocks to facilitate large bandwidth channels (ideally 100 MHz contiguous) for 5G systems.

72. PSBN Innovation Alliance proposes that the Department give some consideration to harmonizing with the 20 MHz blocks in the U.S. and reserving some spectrum for public safety / municipal use.[36] The Department should strongly reject both of these proposals. First, Rogers believes it is important to highlight that public safety emergency responders are already able to depend on reliable, priority access connectivity to do their jobs and ensure public safety through Rogers' First Priority Service.[37] Other Canadian mobile network operators provide similar services today. By taking spectrum away from commercial network operators – especially national network operators like Rogers that continue to develop innovative services for all end-users, including public safety – this would actually provide a lower quality of service for emergency responders. Second, there are no plans in the U.S. to reserve 3800 MHz spectrum for public safety usage, so there are no equivalent 700 MHz B14 devices being specifically created for a public safety 3800 MHz band. Third, municipalities that determine the best use of taxpayer funds is to build their own networks instead of getting service from Canada's world-class facilities-based operators can continue accessing WBS spectrum or other licence-exempt bands. Lastly, public safety spectrum in the 700 MHz band has still not been deployed following its allocation several years ago and it is therefore unclear why this crucial 5G spectrum band should be specifically reserved for this same purpose at this time. Commercial operators are already investing heavily to deploy

[35] Intelsat Comments, pg 23; Inmarsat Comments, pg 4.
[36] PSBN Innovation Alliance Comments, para 43.
[37] Rogers, *Rogers rolls out First Priority Service for first responders*; https://www.rogers.com/business/blog/en/rogers-rolls-out-first-priority-service-for-first-responders-2.

5G networks and services using other mobile spectrum bands and they are eager to utilize the 3800 MHz band to enhance these crucial services. Consumer, industrial, and public safety users will benefit from these advanced new services.

73. The Department should also strongly reject the proposal by Advanced Interactive to permit FDD systems into a TDD band.[38] 5G systems in the 3800 MHz band will rely on massive MIMO and beam steering to significantly increase spectral efficiency, which currently depend on TDD to function. While massive MIMO may eventually be available in FDD, it will always be less efficient than TDD massive MIMO due to a number of technical of physical characteristics inherent in FDD massive MIMO operations. Further, mixing of FDD and TDD systems can lead to channel impairments where a mix of FDD and TDD attempt to share the same spectrum.

74. Allowing FDD in this beach-front 5G spectrum represents a massively sub-optimal use of this valuable and scarce resource, effectively reducing the amount of high-capacity spectrum available in the 3800 MHz band. Even if such systems were restricted to rural/remote areas, there is still significant risk that the deployment of proprietary, niche systems would simply pollute the band and potentially sterilize large geographic areas for future TDD deployments. Depending on the band pairing, it could sterilize holdings of multiple TDD operators. With all the efforts the Department is undertaking to rationalize the coordination challenges between legacy WBS equipment and flexible use in the 3500 MHz and 3800 MHz bands, it makes absolutely no sense to consider allowing FDD systems in the 3800 MHz band.

[38] Advanced Interactive Comments, pg 3.

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.

75. After careful review of the proposals and positions, the record still clearly demonstrates that the best overall long-term policy outcome for Canada is moving WBS operators out of 3650-3700 MHz and into 3400-3450 MHz at an accelerated timeline, and ensuring that their new equipment is sufficiently frequency agile and synchronizable to not interfere with adjacent users. This view is also shared by Nokia and Bell.[39] It is worthwhile to note that both the BC Broadband Association and CanWISP also propose allocating 3400-3450 MHz to WBS.[40] For clarity, Rogers does not support their additional proposals for access to this spectrum in addition to 3900-3980 MHz. No convincing evidence is provided that the limited gains of keeping WBS in their current location (Option 1) would come close to balancing the much greater harms to the majority of Canadians and the Canadian economy that would result from increasing deployment costs and requiring guard bands or other mechanisms for coexistence with adjacent flexible use systems, unduly reducing the efficient use of spectrum.

76. No material evidence is provided that more than 50 MHz of WBS spectrum is required to provide 50/10Mbps broadband speeds with rural and remote customer densities. As Bell further highlights, in addition to 50 MHz WBS spectrum, operators seeking more spectrum can look to other licence-exempt bands such as 5.2 GHz HPOD or the 50 MHz set-aside in the 3500 MHz band.[41] The Department

[39] Nokia Comments, pg 4; Bell Comments, para 57.
[40] BC Broadband Association Comments, para 27; CanWISP Comments, pg 16.
[41] Bell Comments, para 54-55.

has also just released a 6 GHz Consultation that could see another 1.2 GHz spectrum be made available for licence-exempt usage – almost three times the Department's total proposal (3450-3900 MHz, 450MHz) for licensed flexible use. If the Department moves WBS to the 3400-3450 MHz range, the entire 3500 MHz band (3450-3650 MHz) will be within a 300 MHz IBW, which could provide some additional operational benefits for operators that bid on 3500 MHz spectrum or are provided spectrum through the 3500 MHz FWA transition process.

77. Regardless, of where WBS is ultimately moved, they clearly do not require more than their current 50 MHz allotment. For certainty, the Department should strongly reject proposals by BC Broadband Association, CanWISP, CCSA, and Advanced Interactive to massively expand the WBS band or provide multiple frequency ranges for WBS.[42] There has been only limited, weak evidence supporting any need for WBS to have more than 50 MHz and there is zero evidence that there is a need or good policy outcomes from adopting multiple WBS allocations.

78. The Department should also strongly reject Ecotel's proposal for making 3700-3800 MHz available for private networks. The current allotment of 50 MHz of mid-band spectrum is more than sufficient for providing connectivity to the remote industrial customers in Ecotel's business model, while other bands like 5.2 GHz HPOD, future 6 GHz, and licence-exempt mmWave bands will be able to provide much faster speeds and low-latency for industrial users looking to deploy in-building systems for innovation. Taking away additional spectrum from exclusively licensed flexible use operators – who may ultimately be prevented by ISED rules from creating 100 MHz contiguous blocks – would greatly harm Canadians and Canada's economic prosperity.

79. The Department should also reject calls for Option 1 in order to allow importing of Band 48 CBRS devices. Moving WBS to 3400-3450 MHz will allow WBS operators to access the large B42 or n78 ecosystems, whereas the CBRS licensing regime is wholly-inappropriate in the Canadian context, since there is no hierarchy of users with federal and military incumbents needing to be protected. Further, most proponents of allowing Band 48 devices are clear that they do no want an opportunistic licensing regime. The Department should also strongly reject the PSBN Innovation Alliance's recommendation that an opportunistic licensing regime be created in the 3800 MHz band specifically for public safety organizations.[43] As Rogers has highlighted above, public safety organizations already have the ability to secure priority access to commercial mobile networks like Rogers and they have

[42] CCSA Comments, para 10; Advanced Interactive Comments, para 9.
[43] PSBN Innovation Alliance Comments, para 54.

valuable dedicated 700 MHz spectrum that they have not yet deployed. Injecting such uncertainty into spectrum rights would, in fact, harm public safety operations by slowing deployments in areas with already challenging economics.

80. While Rogers continues to strongly support relocating WBS users as soon as possible, we remain skeptical that moving them to 3900-3980 MHz is the best approach, as proposed in Option 2 of the Consultation. Moving current WBS users to the bottom of the new 3500 MHz band will allow for the additional release of 330 MHz of contiguous spectrum (3650-3980 MHz) for 5G implementation, if the Department adopts Rogers' (and Nokia and Bell's) proposals. In the long term, this modified Option 2 will help facilitate the eventual implementation of 100 MHz blocks by multiple facilities-based flexible use network operators. The net benefits of moving WBS to 3400-3450 MHz make it the optimal policy choice for the majority of Canadians and the Canadian economy, even when accounting for any funding support to transition WBS operators out of their current location at the same time frame as the proposed FSS clearing schedule in order to make the spectrum available in urban 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.

81. It is important to clarify at the outset that both the options proposed by the Department will have costs attached to them. Even under Option 1, many WBS operators will need to update their networks and end-user devices. While these direct, explicit costs may be less than Option 2 (as proposed by ISED), the hidden, implicit costs to flexible use operators and the resulting drag on the Canadian economy will be much greater. The Department must weigh all potential gains and trade-offs of the different options and select the best "net-net" policy for Canada.

82. After reviewing the limited evidence put forward, it is clear that the most cost-efficient option is to move WBS licensees to 3400-3450 MHz. WBS licensees that operate modern LTE networks may be sufficiently frequency agile to support retuning to the range with their current network equipment and potentially customer premises equipment (CPE). Some submissions, especially WISPs, highlight what they believe will be substantial costs to themselves – conveniently omitting the Department's proposals to provide transition funding. None, however, address the

greater overall costs to the Canadian economy that will result from the need for flexible use licensees in the 3500 MHz and 3800 MHz band being required to buy significantly more radios over a much broader area to deal with their fragmented assignments. Moving WBS operators from their current location will ultimately cost less to Canadians than having them remain in their current location.

83. Ecotel does not provide any costing guidance but suggests that the Department's Option 2 would require 4G LTE operators to move to 5G NR; Iristel also assumes a move to 5G (and their cost estimates of $450-500 million for all WBS operators seems wildly inflated based on our own costing investigations).[44] This assertion is incorrect. Vendor roadmaps are still being finalized and, until the final location and technical rules are set for WBS, it is unclear what equipment ecosystems will be available "off-the-shelf" or easily modified. While it may make sense for WBS operators to take the opportunity to upgrade to 5G, it is likely that operators will be able to continue operating in 4G LTE. For instance, Rogers is aware that Ericsson radios available today will support B78D (3700-3980 MHz) and multiple technologies, so will be capable of operating in LTE mode.

84. However, it is possible, at least initially, that there will not be a robust LTE CPE ecosystem available at 3900-3980 MHz and may require custom Canadian market equipment. Rogers believes there is greater uncertainty for rural WBS providers at 3900-3980 MHz than at 3400-3450 MHz, which already has a robust 4G/5G network and CPE ecosystem, is the ideal location.

85. Rogers' estimate of $100,000 per site, including installation but excluding engineering (which is partly done in-house) is significantly less than Iristel's estimate of $150,000 including engineering. While our scale provides greater buying power than a typical WBS operator due to their lower volumes, Iristel's estimates are still inflated. Further, Iristel's cost estimate includes backhaul upgrades and augmentation, which will primarily be the result of increasing user demand, not a shift to 5G. Iristel even admits that their cost estimates include investments necessary "to keep up with increasing demand".[45]

86. Accepting that Iristel's numbers are overly-inflated (both individual line items and with costs not relevant to transition), they have estimated that it would cost an average of $1,500 per household to transition, equal to about 29 months of revenue. Generally speaking, the funding programs for connecting rural Canadians have a public funding cap of 50%, which means the applicant must cover the

[44] Ecotel Comments, para 78; Iristel Comments, para 53-64.
[45] Iristel Comments, para 65.

remaining 50%. As such, at least half of this might be covered by rural broadband funding programs, or more if special accommodations are made for displaced WBS systems. This would suggest that WBS operators could recover their own capex costs within 15 months and still be in possession of a brand-new network that can be amortized over 15-20 years. Further, Iristel's estimates are based on a move to 3900-3980 MHz; overall costs will be substantially less should WBS be relocated to 3400-3450 MHz.

87. Rogers again notes that the additional economic activity triggered by 5G services will lead to additional tax revenue for all levels of government and more than recoup the transition costs. The economic gains will be maximized through having multiple facilities-based mobile networks being able to access 100 MHz contiguous channels. Moving WBS licensees is a win-win-win for industry (flexible use and WBS), government revenues, and Canadian taxpayers and consumers.

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.

88. As Rogers identifies in our comments, the proposed displacement timelines for WBS operators, particularly in urban areas are much too long. The Department should make all efforts to align urban displacement with the 3500 MHz band, as WBS coordination may constrain crucial 3500 MHz deployments. Rogers fully supports Telus' proposal that ISED should announce a 1-year notification of displacement of WBS from urban areas in its decision for this consultation, with rural displacement to be completed by December 2023.[46]

89. Bell proposes to displace both rural and urban WBS operators by December 2023 and highlights that transitioning to 3400-3450 MHz also will be quicker than the Department's Option 2.[47] It is telling that BC Broadband Association also states that making 3400-3450 MHz available to WBS that operators can begin their transition process immediately.[48] For certainty, Rogers only supports the movement of WBS to 3400-3450 MHz, and not the additional assignment of 3900-

[46] Telus Comments, para 80.
[47] Bell Comments, para 61.
[48] BC Broadband Association Comments, para 36.

3980 MHz for WBS. The overall benefits of moving WBS to 3400-3450 MHz (and requiring their ability to synchronize with adjacent flexible use licensees) again shows itself to be the superior policy option.

90. SaskTel, Quebecor, Mobilexchange, Cogeco, and Shaw all more generally support the timelines as proposed by ISED.[49] While this is the minimum timing that should be adopted by the Department to not slow deployment in the 3800 MHz flexible use band, it will still negatively impact some deployments of 3500 MHz.

91. While some WBS operators unsurprisingly disagree with the timeline, there also appears to be some consensus that funding may really be the key issue. For instance, CCSA states they need a five-year transition period "to absorb the costs of the transition"; TekSavvy states the timeline is too short but also that if the Department adopts its proposed timelines, it needs to award transition funding to WISPs starting in July 2022; and, the Regional Municipality of Durham, as a publicly-funded body also highlights a need for timing to budget.[50] As the Department has already noted that funding will be available for rural providers to transition, and senior levels of government could look to make additional funding available to lower levels in order to stimulate the economy post-COVID, these objections should be largely moot. As such, the Department should endeavour to move WBS out of urban areas at a faster rate but, at a minimum, could adopt their proposed timelines.

92. Further, in satellite-dependent areas, i.e., areas that do not have current mobile or fixed wireless coverage in exclusively licensed bands, the Department could adopt a 2-year displacement notification regime. This would allow the Department and WBS operators to focus on urban, suburban and near-rural areas, allowing deep rural and remote areas additional time to make a successful transition. However, all WBS operations outside of urban areas would still need to abide by a common national TDD synchronization framework to not unduly delay the deployment of exclusively licensed flexible use networks.

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.

[49] SaskTel Comments, pg 21; Quebecor Comments, para 43; Mobilexchange Comments, pg 14; Cogeco Comments, para 42; Shaw Comments, para 95.
[50] CCSA Comments, para 18; TekSavvy Comments, para A16; Regional Municipality of Durham Comments, pg 2-3.

93. As provided in our comments, Rogers is generally supportive of the Tier 4 service areas proposed in annex D but we identified several additional Tier 4 areas that would need to be added to ensure protection for both WBS systems and new flexible use deployments from harmful interference. Bell, Ecotel, Quebecor, and SaskTel are also generally supportive of the Department's proposals.[51]

94. While some stakeholders, including rural network operators propose to use Tier 5, the Department should not adopt such proposals. Rogers continues to generally believe Tier 5 service areas are best suited to frequencies above 6 GHz, and likely mmWave bands and above, until better coordination tools and advancements in technology make interference mitigation technically and economically feasible in low and mid-band spectrum. No evidence is provided that would mitigate any of the concerns that Rogers has identified based on our own significant experience at coordination challenges in the 3500 MHz FWA band with adjacent WBS operators. These issues will only increase as the band becomes flexible use, until WBS operators are successfully displaced, ideally to 3400-3450 MHz, and update their network equipment to be able to synchronize with adjacent users.

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

95. After reviewing the comments and proposals, Rogers still fully supports Decision 1 in the Consultation document, to place a moratorium on the deployment of new WBS stations in urban Tier 4 service areas and supports extending the moratorium to all Tier 4 service areas across the country to prevent further deployment of WBS licensees' 3650-3700 MHz sites that will need to be displaced in the near future. Cogeco and Shaw also highlight that no new licences should be issued to prevent speculation, while Bell states that the moratorium should not interfere with the secondary market, allowing licences to be transferred / cancelled / reissued, so long as it does not result in any new stations.[52] Rogers continues to support both these positions – no speculative licensees or WBS network expansion in 3650-3700 MHz but normal operation of the secondary market.

96. While some WBS licensees argue that they should be allowed to continue network expansion in the current WBS band, the Department should reject these proposals. Continuing to deploy out-dated WBS equipment will simply expand the challenges

[51] Bell Comments, para 62; Ecotel Comments, pg 80; Quebecor Comments, para 43; SaskTel Comments, pg 21.
[52] Bell Comments, para 64; Cogeco Comments, para 46; Shaw Comments, para 97.

and slow the deployment of flexible use in the 3500 MHz and 3800 MHz bands. Further, unscrupulous actors may rush to deploy legacy WBS equipment in order to facilitate access to additional transition funding to modern network equipment that they would not otherwise qualify for – either taxpayer-funded or as an attempt to receive incentive payments from flexible use licensees. For WBS operators genuinely interested in significant near-term network expansion, it should again be highlighted that moving to 3400-3450 MHz will allow for network expansion at an accelerated timeline – often using their currently deployed equipment.

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

97. Based on the submissions, future WBS licensees appear likely to be similar to today's WBS licensees and primarily focus on broadband connectivity in rural and remote areas, where business cases for network deployments using exclusively licensed spectrum may be more challenging but 50 MHz is more than sufficient to deliver 50/10Mbps speeds. There will also continue to be interest in creating private networks to support vertical industries such as industrial automation or private broadband networks on enterprise campuses but, again, Rogers believes that these use cases will be best, and most likely, served by 5G network slices using exclusively licensed spectrum. Some services and applications may continue to be augmented (or served) by licence-exempt spectrum in other bands, including in the 6 GHz band for which the Department has just launched a consultation.

98. We again recommend no exclusionary requirements preventing large network operators from acquiring a WBS licence and using the WBS spectrum along side their exclusively licensed spectrum. According to the ISED SMS database, Rogers, Bell, and Telus all currently hold WBS licences and there have never been any sharing issues in the WBS band of which we are aware. As such, the Department should strongly reject the proposals by TekSavvy, Iristel, and CanWISP to treat large national or regional incumbents any differently.[53]

99. The Department should also strongly reject any proposals by Cogeco, Federated Wireless, Redline Communications, PSBN Innovation Alliance, and the Dynamic Spectrum Alliance to create any CBRS-type of licensing scheme anywhere in the band.[54] The rejection of CBRS schemes are explicitly echoed by the RABC, BC Broadband Association, Toronto Police Service, Telus, SaskTel, Quebecor, Mobilexchange, and Ecotel.[55] Most highlight that the unique situation that exists in the U.S. does not exist in any of the proposed locations for the WBS band and that such systems have had little success anywhere else globally. Ecotel also notes that that their usage of WBS spectrum – and presumably other potential private network usage – does not connect to the public internet for security reasons, so would have no way to coordinate. PSBN Innovation Alliance again is looking for a "digital right of way" access for public safety, again failing to recognize that priority access for public safety is already available on national networks today.

100. Rogers has not seen any evidence to change our view that these CBRS-type technologies have yet to show any actual real-world value and, until then, it does not make sense to use them to manage crucial and scarce spectrum resources.

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.

[53] TekSavvy Comments, para A19e; Iristel Comments, para 77; CanWISP Comments, pg 19.
[54] Cogeco Comments, para 47-48; Federated Wireless Comments, pg 9; Redline Communications Comments, pg 16; PSBN Innovation Alliance Comments, para 70; Dynamic Spectrum Alliance Comments, pg 7.
[55] RABC Comments, para 53; BC Broadband Association Comments, para 47; Toronto Police Service Comments, pg 19; Telus Comments, para 95; SaskTel Comments, pg 24; Quebecor Comments, para 51; Mobilexchange Comments, pg 15; Ecotel Comments, para 85.

101. There is broad consensus for the Department's proposal that existing FSS earth stations in 3650-3700 MHz be permitted to continue to operate on a no-protection basis, with only TekSavvy and CanWISP calling for their complete removal. However, we do not support SES's request that the Department allow for the construction of new FSS earth stations in the 3650-3700 MHz even on a secondary, non-protected basis,[56] as this would be counter to the goal of eventually completely clearing all satellite operations up to 4100 MHz (or above) across all of Canada. While we support the need for earth stations to support ongoing limited C-band satellite usage for at least the short-term, we continue to strongly recommend that new or existing earth stations have no impact on expected terrestrial deployments.

102. Rogers fully supports Telus' view that flexible use operators should not be required to inform FSS earth stations of their status or technical parameters. These grandfathered operations are no-protection and a notification regime would unduly burden flexible use deployment.

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).

103. Most commenters support the Department's intention to identify remote areas as satellite-dependent; although many, similar to Rogers, recommend some adjustments in order to not include areas currently served by mobile, fixed wireless, or fibre within a "satellite-dependent" area. Shaw, SaskTel, Iristel, Ericsson, Telus, CanWISP, Xplornet, and RABC all share this view.[57] In particular, although we think their modelling parameters should be adjusted, we agree with Telus' concern that should Tier 4-157 Powell River somehow be identified as satellite-dependent, it could have a significant impact on large populations such as Nanaimo and even significant portions of Greater Vancouver.[58]

[56] SES Comments, pg 15.
[57] Shaw Comments, para 100; SaskTel Comments, pg 26; Iristel Comments, para 79; Ericsson Comments, pg 17; Telus Comments, para 112-113; CanWISP Comments, pg 20; Xplornet Comments, para 48-49; RABC Comments, para 58.
[58] Telus Comments, para 110.

104. We continue to support the adoption of a principle that, wherever there is currently mobile or fixed terrestrial coverage in access bands, it is not a satellite-dependent area. Further, the Department should carefully assess potential impacts of protecting earth stations in satellite-dependent areas to population centres in neighbouring non-satellite-dependent areas.

105. Since the Consultation comments deadline on October 26, 2020, Rogers is aware that the Department has updated the *Service areas for competitive licensing.*[59] Although the Department indicates that "Tier 5 values are to be considered draft and are subject to change until import to ISED systems is completed", we have identified significant overlap between Tier 5 areas designated as "remote" and the Consultation's satellite-dependent areas. As these Tier 5 values are still draft, we cannot offer a final recommendation but upon initial review, we would generally support this mapping, as it closely lines up with our proposal, with the exception of Prince Rupert-Terrace. Again, we believe the Department's proposal could best be enhanced and validated by the adoption of our principle.

106. For certainty, Rogers continues to generally believe Tier 5 service areas are best suited to frequencies above 6 GHz, and likely mmWave bands and above, until better coordination tools and advancements in technology make interference mitigation technically and economically feasible in low and mid-band spectrum.

107. The Department should strongly reject Inmarsat's proposal to designate their current earth station in Weir, Quebec as a satellite-dependent area and, further, to expand its presence as a consolidated gateway site.[60] The existing earth station will already create a significant notification and coordination burden to 3500 MHz flexible use operators due to its proximity to Montreal. An earth station that must be coordinated with regard to the deployment of sites within the second most populous metro area in Canada cannot in any credible way claim to be in a "satellite-dependent" area.

108. While Rogers does not support Weir as the ideal location, Telesat's proposal of Allan Park is infinitely worse. Allan Park is located near Hanover, Ontario, within 100 km of major southwestern Ontario population centres such as Guelph and even the western portions of the Greater Toronto Area. If the earth station at Allan Park is granted protection for the entire 3700-4200 MHz band, it will impact flexible use stations in these areas below 4000 MHz for all network operators. Weir is,

[59] ISED, *Service areas for competitive licensing*; https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01627.html.
[60] Inmarsat Comments, pg 5.

relatively, a far better location for a gateway due to its geography being surrounded by mountains, while Allan Park is not very well shielded by geography. The ideal location for consolidated gateways will be a minimum of 200 km from population centres and shielded by geography. However, Rogers would support Telesat receiving compensation, if necessary, to help move the current Allan Park earth station to a more suitable location.

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.

109. The record on whether to include remote industry operations in the definition of satellite-dependent areas is mixed. However, Rogers finds no compelling evidence that changes our view that it should not be permitted. Again, while oil drilling platforms far offshore in international waters or in remote Far North Canadian domestic waters may indeed be in satellite-dependent areas, this will not always be the case with all “remote” industry operations. Expanding the definition of satellite-dependant areas could unduly restrict the deployment and expansion of flexible use systems along transit corridors or into new areas. Further, no evidence was provided to support any such operations would require access to more than 200 MHz of FSS C-band spectrum that satellite operators will retain access to in non-satellite-dependent areas.

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.

110. There is broad support, including from the satellite and broadcasting industries for the Department’s 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. The Department should discount Inmarsat’s opposition to the proposals to maintain usage of 3945-3955 MHz at their Weir

facility to support their Inmarsat-3 and -4 satellites.[61] Inmarsat speaks throughout their comments of planning to replace these satellites in the next few years, and thus should have ample amounts of time to accommodate the design of a new frequency range.

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

111. Rogers continues to fully support matching the U.S. plan for clearing of the FSS band, as Canadian FSS operators cannot reasonably go faster than the FCC timetable and U.S. operators, and it is wasteful to go slower. We observe that there is broad consensus amongst terrestrial stakeholders to adopt the Department's proposed timelines, with Telus and Bell showing interest or preference for the Telesat proposal timelines. As discussed further below, Rogers does not support the Telesat proposal as presented and the Department should ultimately not proceed with having Telesat manage the spectrum transition and sale processes.

112. Most satellite industry stakeholders are also generally aligned with the proposal; although, they encourage the Department to provide financial compensation in order to facilitate the timing.[62] Further, Eutelsat highlights that allowing Canadian FSS operations to continue on a no-protection basis in 3700-4000 MHz in non-satellite-dependent areas, unlike in the U.S., will allow satellite operators to prioritize areas where flexible use will be initially deployed.[63]

113. Some broadcasters object to the timelines but, of note, CBC/Radio-Canada states that they have already confirmed their own transition date as March 2023 and even with delays will be able to meet the proposed December 2025 timeline.[64] Further, as the Department states, U.S. transition timelines may determine the availability of Canadian services or U.S. broadcast content regardless of any intervention from ISED and there was no evidence provided to counter this view.[65]

[61] Inmarsat Comments, pg 5.
[62] SES Comments, pg 18; Intelsat Comments, pg 26.
[63] Eutelsat Comments, para A24.2.
[64] CBC/Radio-Canada Comments, pg 9.
[65] ISED, *Consultation*, para 125.

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

114. There is a general consensus that the U.S. transition will have no material impact on the availability of FSS capacity in Canada. In fact, Eutelsat suggests that it is possible that the U.S. transition may increase the availability of new FSS capacity in Canada.[66] Rogers notes that Intelsat is implementing a number of efficiency upgrades including a mix of High Efficiency Video Coding (HEVC), Advanced Video Coding (AVC) and other data compression technologies as part of their U.S. transition,[67] and this will have spillover benefits for the Canadian market.

115. Satellite operators and customers do repeat their calls for transition funding assistance, which Rogers supports and can be funded from auction or other government sources to ensure an orderly and rapid displacement in 3700-4000 MHz.

[66] Eutelsat Comments, para A25.2.
[67] Intelsat, *Submission for the Record – Updated Final Transition Plan GN Docket Nos. 18-122, 20-173*; https://ecfsapi.fcc.gov/file/10281362705265/Updated%20Final%20Transition%20Plan%20-%20Intelsat%2010-28-2020.pdf.

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

This information should be submitted on a confidential basis, as instructed in section 13.

116. Shaw notes they are a provider of uplink C-band services in Canada and are already in the process of transitioning these services to the 4000-4200 MHz band on another satellite, and further highlight that two of Telesat's three C-band satellites are approaching end-of-life.[68] The public evidence in response to the Consultation clearly shows that FSS operations in Canada will be able to meet, if not exceed, the Department's proposed displacement timelines.

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.

117. There is general consensus for the Department's 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 non-satellite-dependent areas. This consensus includes most satellite operators, though they again repeat their calls for transition funding, which Rogers again supports.

[68] Shaw Comments, para 104.

118. Corus and North American Broadcasters Association recommend a December 2025 deadline due to the Canadian process "lagging" the U.S. but offer no clear idea of what such a delay would actually gain Canadians, since there will be no more U.S. FSS usage.[69] The other lone outlier is Inmarsat, who continues to broadly oppose any transition proposals that may impact their legacy satellites or earth station outside of metro Montreal. The Department should reject these positions as either irrelevant or simply obstructionist to the overall efficient management of Canada's spectrum resources. However, Rogers does continue to support transition funding for impacted operators being displaced.

119. In conjunction with the proposed FSS transition timelines, we still strongly support accelerating WBS displacement, particularly in urban areas, to ensure they do not hamper flexible use deployments in the 3500 MHz band. Further, we continue to strongly recommend that the Department consult on the licensing policy for the 3650-3980 MHz band and complete the auction and any rationalization process of the broader 3300-4200 MHz flexible use band well ahead of the December 2023 transition deadline.

[69] Corus Comments, pg 7; North American Broadcasters Association pg 5.

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)

120. After reviewing other submissions, we continue to strongly recommend that the Department rely on the least restrictive technical parameters to protect FSS earth stations in order to not unduly constrain the deployment of flexible use systems to the detriment of Canadian consumers and businesses, prior to and after the transition deadline in both satellite-dependent and non-satellite-dependent areas.

121. For certainty, Rogers does not support the introduction of any notification regime for flexible use deployments in either satellite-dependent or non-satellite-dependent areas based on a distance trigger. A pfd threshold based on sound engineering principles is better suited for coordination of the adjacent services than

a simplistic trigger like distance, and ISED should reject Intelsat's recommendation to adopt one,[70] as it would create an undue burden on flexible use deployments.

122. If the Department does ultimately adopt a less efficient coordination trigger, we agree with Xplornet that 25 km is excessive.[71] Further, after the transition deadline, all FSS earth stations operating in 3700-4000 MHz, in all areas, which are not eligible for licensing and thus operate on a no interference, no protection basis, should have no expectation of notification within any distance; there must be no deployment impacts on crucial new flexible use systems from licence-exempt stations.

123. Rogers also continues to fully support that after the transition deadline, existing licensed FSS earth stations operating in the entire 3700-4200 MHz band in satellite-dependent areas will not be protected from flexible use operations in the adjacent 3450-3700 MHz band. We again highlight that frequency separation beyond the first 100 MHz, i.e. FSS earth stations operating above 3800 MHz, may adequately protect FSS earth stations using a less restrictive value than -13 dBm/MHz, and that FSS in all areas of Canadian should continue to be repacked into 4000-4200 MHz as wherever possible – a position also supported by Telus.[72]

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.

124. There is general consensus of the Department's proposed change to the CTFA to add the new footnote CZZ proposed. Rogers supports Telus' recommendation to add a clause to clarify that FSS will not constrain flexible use in non-satellite-dependent areas.[73] We also fully agree with Ericsson's observation that satellite-dependent areas could decrease over time and that their C-band usage should be monitored by the Department.[74]

125. Rogers has concerns that the proposals by SES and Telesat to afford the consolidated gateways in non-satellite-dependent areas protected access to the 3700-4000 MHz band could have negative impacts on the deployment of flexible use services.[75] As discussed further below, the Department should ensure that any

[70] Intelsat Comments, pg 29.
[71] Xplornet Comments, para 59.
[72] Telus Comments, para 137.
[73] Telus Comments, para 143.
[74] Ericsson Comments, pg 18.
[75] SES Comments, pg 21; Telesat Comments, para 118.

existing or future gateways in southern Canada are (re)located well away from population centres or transportation corridors so as to not impact flexible use deployments.

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

126. There appears to be general consensus across industries that gateways can be consolidated into two sites, with some proponents making a reasonable proposal to have one in the east and one in the west of the country. Most stakeholders also appear to recognize the importance of locating these sites away from major population centres, so as not to unduly constrain Canadians ability to access innovative new flexible use services.

127. No proposal was provided that would be superior than our own that the gateways be located away from the urban Tier 4 as defined in annex D and modified by Rogers. We maintain that, at a minimum, the new facilities should be at least 200 km from any major urban centre to allow for population growth of the urban centres and any new suburban or ex-urban expansion. As such, the Department should strongly reject Telesat's proposal to make the Allan Park earth station a gateway (primary or secondary) due to its potential negative impacts on flexible use deployment in and around the Golden Horseshoe area of Ontario. The Department should also reject the Inmarsat proposal to make their existing Weir earth station a gateway candidate.[76] Their presence will already create an undue coordination burden on 3500 MHz flexible use deployments in the Montreal area. Expanding their operations would undoubtedly create even more constraints on flexible use deployment in Canada's second largest metro urban area.

128. For certainty, while Rogers does not support either of these locations, we believe the Weir earth station would be relatively superior due to better natural shielding from geography.

[76] Inmarsat Comments, pg 7.

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.

129. There is near unanimous support for the Department's proposals to issue interim authorizations for certain existing licence-exempt earth stations in the 3700-4200 MHz band. We continue to support the proposal with the understanding that no existing licence-exempt earth station should be provided interim authorizations in major urban Tier 4 areas as defined by Rogers in response to Q17.

130. TekSavvy states that under Option 2, this proposal could create potential coordination and interference issues for relocating WBS licensees.[77] Rogers again highlights that such a potential impact is yet another reason that relocating WBS to 3400-3450 MHz is the superior policy option.

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.

131. Again, there is general support for the Department's proposals with TekSavvy and CanWISP both citing concerns that this may unduly impact their operations.[78] Rogers is receptive to these concerns and supports Telus' statement that flexible use should not be restricted in any way by secondary status systems.[79]

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.

132. There is general support for the Department's proposals with TekSavvy and CanWISP again citing concerns that this may unduly impact their operations during transition under an Option 2 scenario.[80] There would be no coordination or

[77] TekSavvy Comments, para A31.
[78] TekSavvy Comments, para A32; CanWISP Comments, pg 23.
[79] Telus Comments, para 150.
[80] TekSavvy Comments, para A33; CanWISP Comments, pg 24.

potential interference between WBS and FSS if the Department adopts the superior option of relocating WBS to 3400-3450 MHz.

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.

133. There is also general support for the Department's proposals, with TekSavvy and CanWISP once again citing concerns that this may unduly impact their operations during transition under an Option 2 scenario.[81] However, relocating WBS to 3400-3450 MHz would again make these coordination challenges moot.

134. The Department should strongly reject Iristel's proposal to allow WBS to operate on a non-interference basis to FSS until the transition deadline under their proposed modified Option 1. For all the reasons Rogers has identified above, Option 1 is vastly inferior to Option 2, and the modified Option 1 proposed by Iristel (and others) would further negatively impact all Canadians. The best option net-net for Canada and Canadians is to relocate WBS to 3400-3450 MHz, and to do so as expeditiously as possible.

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.

135. There is general support for the Department's proposal that in satellite-dependent areas, existing earth stations that operate under an interim authorization can receive in-band protection from flexible use operations in the 3700-3980 MHz band before and after the transition deadline. The Department should reject SES's proposal to receive additional protection from flexible use stations below 3700 MHz after the transition,[82] which could further impede deployment in the 3500 MHz flexible use band.

[81] TekSavvy Comments, para A34; CanWISP Comments, pg 24.
[82] SES Comments, pg 24.

136. Rogers' general support for the proposal continues to be contingent on the Department adopting our proposed adjustments to satellite-dependent areas, which will prevent undue restrictions on flexible use deployments in urban Tier 4 areas that already have mobile and terrestrial coverage (and, thus, are not satellite-dependent). Further, we agree with Iristel's recommendation for the Department to adjust satellite-dependent areas in the future as terrestrial networks continue to expand.[83] We also share Xplornet's reservations about whether a primary allocation to FSS is required in the 3700-4200 MHz band in any part of the country, including satellite-dependent areas, based on Telesat's proposal.[84] The Department should remain committed to repacking all FSS into the 4000-4200 MHz range (and, longer term, 4100-4200 MHz) across Canada, wherever and whenever possible.

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.

137. Again, there is broad, general cross industry support for the Department's proposal that any existing licence-exempt earth stations that operate under an interim authorization receive no protection from adjacent band WBS and flexible use stations operating below 3700 MHz before and after the transition deadline. The Department should reject any proposals, such as by SES,[85] to create undue and additional constraints on flexible use deployments below 3700 MHz, which would only slow terrestrial network expansion.

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.

138. There is general consensus of the Department's proposals. However, Rogers still recommends that the Department only allow new receive-only FSS earth stations in the 4000-4200 MHz band to request access the interim authorization process in

[83] Iristel Comments, para 95.
[84] Xplornet Comments, para 64.
[85] SES Comments, pg 24.

satellite-dependent areas (with Rogers' proposed adjustments). In non-satellite-dependent areas, new receive-only FSS earth stations should be limited to 4100-4200 MHz.

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.

139. The Department should not adopt Telesat's proposal to exclude interim authorization from any fees. Rogers does not support this, as we are concerned that it would provide licence-exempt stations the same protection status as licensed FSS earth stations without the obligations (including costs), which would be unfair. It is well documented that the Canadian terrestrial wireless industry pays some of the highest, if not the highest, spectrum acquisition and licensing fees in the world. The satellite industry already pays a pittance and should pay for at least the cost-recovery of administering their interim authorizations. Further, the Department should take all steps to implement the new fixed fee regime in time for the April 1, 2021 fiscal year to help support capacity expansion in order for terrestrial network operators to sustainably enhance and extend rural broadband access.

140. We again recommend the Department strongly reject any proposal, such as made by SES, to provide additional adjacent band protection for licence-exempt FSS earth stations.[86]

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

141. There is broad, general consensus for the Department's proposals with the exception of TekSavvy and CanWISP, who propose that in non-satellite dependent areas, the eligibility should be tied to: received power; availability of alternatives for the service; and, proximity to serving WBS sites.[87] Again, moving WBS to 3400-3450 MHz would fully negate these concerns.

[86] SES Comments, pg 26.
[87] TekSavvy Comments, para A39.

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.

142. There is near unanimous support for the Department's proposal to no longer issue new licences for fixed services to operate fixed point-to-point applications in the 3700-4000 MHz band. The lone outlier is TekSavvy, who appears to want special dispensation for WBS licensees to be able to operate fixed point-to-point operations in the range.[88] The Department should strongly reject this proposal, as point-to-point fixed services can be accommodated in other bands. Further, the fact that TekSavvy is not one of the two existing systems the Department is considering grandfathering shows that they have little actual interest in deploying in the band and instead are, seemingly, only interested in the band for speculative purposes.

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.

143. While Shaw, Bell, and CanWISP support allowing new licences for fixed services to operate fixed point-to-point applications in the 4000-4200 MHz band, in part due to FS and FSS' historical ability to coexist, almost all other stakeholders oppose. Satellite operators and customers naturally desire to minimize coordination and potential interference in their new, rationalized spectrum band. In the long term as C-band FSS usage continues to decline, Rogers sees the best policy option is to make additional spectrum available for flexible use across the entire 3300-4200 MHz band. Again, there should not be any material impact on fixed service operators as there has been very little demand for fixed services in any part of the band to date.

[88] TekSavvy Comments, para A40.

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.

144. There is mixed support for the proposal to grandfather existing point-to-point operations in the 3700-4000 MHz band under existing licences for fixed service, with most support coming either from the operators (e.g. Bell, Department of National Defence) or those who have no impact due to their locations (e.g. SaskTel, Quebecor).[89] Mobilexchange, Toronto Police Services, North American Broadcasters Association, and PSBN Innovation Alliance do not support grandfathering at all, while Ericsson and Telus support allowing them to continue operations until displacement is required from flexible use.[90]

145. Rogers had investigated the site-licensed FS systems found in annex A of the Consultation document. We were able to locate and map the Bell system (licence number 010038451) located in Tier 4-104 Kenora/Sioux Lookout, Ontario. We continue to believe that it is located far enough from expected near term flexible use deployments to not be an immediate concern. The second system (licence number 010677429), identified as being located in Tier 4-131 Medicine Hat/Brooks, Alberta did not show up in the Department's SMS system. Rogers interpreted this as possibly meaning that the system had been decommissioned in the intervening period. Further, based on the description in the Consultation document, "As the two licensed systems currently operating in the fixed service are located in **remote** areas of the country, ISED is proposing to grandfather the licences indicated in annex A"[91] (emphasis added), and given the remote location of the identifiable system, we supported grandfathering.

146. Based on the Department of National Defence's response, we believe that it is likely their Point to-Multipoint system in Suffield, AB (licence number 01077429) that is the actual unidentifiable system from the annex. However, this licence also does not appear in the public facing section of the SMS database. While we are unable to complete a full investigation into its exact location and licensed

[89] Bell Comments, para 94; Department of National Defence Comments, pg 5; SaskTel Comments, pg 33 Quebecor Comments, para 76.
[90] Mobilexchange Comments, pg 20; Toronto Police Services Comments, pg 25; North American Broadcasters Association Comments, pg 9; PSBN Innovation Alliance Comments, para 119; Ericsson Comments, pg 19; Telus Comments, para 167.
[91] ISED, *Consultation*, para 156.

frequencies, Rogers has significant concerns about the ability to grandfather this system. Plotting a generic 70 km protection zone around CFB Suffield would prevent deployments in the population centres of Medicine Hat and Brooks, as well as the surrounding farming communities. In fact, the potential protection zone would cover so much of the Tier 4 licence area and the major population centres, the 5-year target for the 3500 MHz band of 30% population covered is unachievable, to say nothing about the 10-year (50%) and 20-year (70%) targets. According to our initial review, less than 10% of the population of Tier 4-131 Medicine Hat/Brooks would not be impacted by a potential protection zone.

147. As the Department is well aware, Rogers treats all public safety issues very seriously. However, we are concerned about the unknown potential impact to future 3800 MHz flexible use deployments (e.g. frequencies impacted, size/location of coordination zone, etc.), which could ultimately impact multiple networks and prevent the use of large contiguous blocks of spectrum. Should the Department of National Defence's equipment be sufficiently frequency agile, we would support moving their operations into 4000-4200 MHz as an interim solution until a permanent long-term solution can be found. ISED should also ensure that all relevant technical information is provided securely to all qualified 3800 MHz auction bidders in order for them to determine any impacts and properly value the encumbered spectrum. ISED should also adjust (or eliminate) any deployment coverage requirements to fully account for potential encumbrances (i.e., potentially 90% of the licence area's population).

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.

148. There is broad industry consensus supporting the Department's proposal to rely on technical limits and coordination procedures rather than mandate specific technology solutions and parameters to address interference issues between TDD flexible use systems in the 3650-3980 MHz band. Industry-led solutions will ensure that technical measures to optimize the spectrum use by flexible use can quickly adapt to new developments in the 5G ecosystem and beyond.

149. Nearly every stakeholder also recognized and supported that technical limits and parameters would include TDD synchronization between systems, excepting

Mobilexchange and Toronto Police Services,[92] which leads Rogers to be concerned that they wish to deploy propriety systems that are unsynchronizable and would pollute the band. In addition, Redline Communications states (probably correctly) that WBS and vertical industries have little to no experience in coordination and thus should not be required to coordinate.[93] The Department should strongly reject all these recommendations, as they would have extremely negative impacts on coordination and network management.

150. It is telling that the largest, most experienced network operators in the greater 3300-4200 MHz band (Rogers, Bell, and Xplornet) all highlight that TDD synchronization is absolutely necessary for coordination. Further, Xplornet and Rogers propose the strictest coordination requirements, with Xplornet stating the Department should enforce specific technology solutions, including mandatory TDD synchronization between systems and the use of synchronized GPS radios.[94] While Xplornet perhaps goes further than we support, we also acknowledge the limitations of informal coordination discussions based on our extensive experience in FWA 3500 MHz.

151. As we proposed in our comments, the Department should mandate a stakeholders' roundtable, either through the RABC or another purpose-specific grouping, to align on a common framework for TDD frame and pattern synchronization. Such an approach would allow for an industry-led solution, flexible enough to be updated for future border coordination requirements with U.S. operators, while providing certainty for flexible use deployments everywhere across the country. The Department should also be prepared to backstop all efforts to ensure that all network operators engage in coordination efforts constructively and in good faith, regardless of their size.

152. Finally, the Department should reject proposals by Federated Wireless, Redline Communications, Dynamic Spectrum, Alliance, and PSBN Innovation Alliance to implement a CBRS-type licensing approach in Canada's 3800 MHz band. The CBRS regime in the U.S. was implemented to deal with a specific spectral environment that does not exist in Canada. Further, it would require the creation of a unique Canada-specific equipment ecosystem, as no other region in the world will be making a CBRS system across the proposed 3800 MHz flexible use band (3650-3980 MHz). In our view, introducing a CBRS regime into the Canadian 3800

[92] Mobilexchange Comments, pg 21; Toronto Police Services Comments, pg 25.
[93] Redline Communications Comments, pg 17-18.
[94] Xplornet Comments, para 67.

MHz band would only not provide any benefit for coordination but, rather, would result in the band remaining largely fallow and unused.

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.

153. Rogers fully agrees with the RABC's view that an agreed-upon TDD synchronization framework is essential to maximizing the reuse of co-channel spectrum geographically and without a common framework, large distances, in the order of 60-70 km, will be required to achieve coexistence.[95] Similar to Rogers, Shaw states that the technical standards set out in and SRSP-520 will be sufficient to limit potential harmful interference between operators in the 3650-3980 MHz band.[96]

154. Rogers continues to believe an operator-led coordination approach will only be effective if all parties, from single-site operators to nation-wide service providers, align on a common methodology, a position echoed by others: BC Broadband Association suggest incentives for users to engage in coordination; SaskTel notes operators should work together to implement measures; and, Iristel promotes collaborating at finding technical solutions for interference problems.[97] We also continue to believe that a coordination framework will be required, with set timelines for correspondence between parties, to ensure that an operator does not unduly delay coordination in order to gain or maintain a competitive or financial advantage.

[95] RABC Comments, para 70.
[96] Shaw Comments, para 111.
[97] BC Broadband Association Comments, para 55; SaskTel Comments, pg 34; Iristel Comments, para 104.

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?

155. Rogers fully supports Bell's view that earlier deployment where possible is beneficial and should be able to be managed through the current RSS and SRSP and, further, no adjacent protection should be afforded for WBS operators not in the ISED database.[98] For clarity, Rogers strongly recommends that any current WBS site not listed in the ISED SMS database within the 120 day window the Department provided in the Consultation must accept any future interference from flexible use operators. SaskTel, Shaw, TekSavvy, Xplornet, CanWISP, PSBN Innovation Alliance, and RABC all support that a combination of RSS-192 and SRSP-520 should be sufficient to ensure coexistence for adjacent band flexible use and WBS systems.[99]

156. Provided that a common TDD synchronization framework is established across the 3650-3980 MHz band, we agree that the measures specified in the RSS and

[98] Bell Comments, para 97.
[99] SaskTel Comments, p35; Shaw Comments, para 112-113; TekSavvy Comments, para A45b; Xplornet Comments, para 69; CanWISP Comments, pg 26.

SRSP will be sufficient. Should a common TDD synchronization framework not be established, then we still view the FCC pfd limit of −114.5 dBW/m^2/MHz at the WBS receive antenna be used as the trigger for coordination.

157. Rogers has already noted that an excessive coordination distance would result in unnecessary coordination between flexible use and WBS operators, unduly delaying the deployment of 5G services to Canadians. Using a scientifically refined approach, such as pfd limits, would ensure that coordination is focused on real interference cases, rather than imposing an administrative burden on all parties. As such, the Department should fully reject BC Broadband Association's proposal to impose a simplistic distance coordination trigger.[100]

158. The Department should reject all proposals to introduce dynamic spectrum management as, particularly in this situation, it would introduce significant cost burdens to all parties for coordination challenges that will cease to exist following the relocation of WBS. It is completely bewildering that one could suggest that the way to manage potential, temporary coordination challenges between services for 2-5 years is that all these services (fixed, mobile, WBS, FSS) should upgrade all their current network and CPE equipment and adopt a completely unproven spectrum access and network management regime. Such a proposal would simply be a massive drain of capital, engineering and other labour resources, and time to introduce a temporary measure. It introduces a massive and wholly unnecessary drag on the deployment of advanced new 5G services in this crucial band.

159. Mobilexchange and Toronto Police Services state that current WBS systems in major metropolitan areas represent a barrier to 5G deployment in 3650-3700 MHz and suggests the need for an earlier displacement deadline than December 2023.[101] We fully support all efforts to expedite WBS displacement, particularly in urban areas, as proprietary WBS systems that cannot synchronize with modern TDD systems may also unduly delay 3500 MHz deployments at the top of the band.

[100] BC Broadband Association Comments, para 56.
[101] Mobilexchange Comments, pg 21; Toronto Police Services Comments, pg 26.

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.

160. There is broad, cross industry support for the Department's proposal that until the transition deadline, operators deploying flexible use stations in 3650-3700 MHz band within 25 km of a licensed FSS earth station (not including interim FSS authorization) in the 3700-4200 MHz band be required to coordinate. While some parties suggest it could be smaller (Ecotel) or larger/studied (Corus, North American Broadcasters Association, Telesat),[102] 25 km appears to be the general consensus view and should be the adopted distance.

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.

161. The Department should reject the request by some satellite operators to maintain coexistence requirements for flexible use operations in the 3450-3650 MHz band after the transition deadline. Requiring flexible use systems in the 3450-3650 MHz band to coordinate with FSS earth stations operating in the band 3700-4200 MHz band would unduly constrain the deployment of 3500 MHz flexible use systems to the detriment of Canadian consumers and businesses. Further, in most of Canada, FSS operations will be displaced to 4000 MHz – providing at least 350 MHz of separation between FSS and 3500 MHz flexible use operators. Satellite operators provide no evidence to justify the placing of an undue burden on flexible use licensees after the transition.

162. Inmarsat notes that their concern is regarding in-band, not adjacent band, protection.[103] Rogers again highlights that based on Inmarsat's own stated satellite

[102] Ecotel Comments, pg 120; Corus Comments, pg 13; North American Broadcasters Association Comments, pg 10; Telesat Comments, para 146.
[103] Inmarsat Comments, pg 7.

replacement schedule, that they should also be able to transition into the 4000-4200 MHz band (or another band) on the same schedule as the 3700-4200 MHz FSS displacement, to the benefit of all Canadians living in the metro Montreal area.

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):

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)?

163. There is broad, cross industry support for adopting the U.S. model, including amongst flexible use operators (Bell, SaskTel, Shaw, Telus), WBS operators (Ecotel, TekSavvy, Xplornet, CanWISP), numerous satellite operators (Eutelsat, SES, Telesat), and other commenters (Mobilexchange, Nokia, Department of National Defence, Toronto Police Services, PSBN Innovation Alliance, RABC). Even CBC/Radio-Canada highlights that the U.S. system is more equitable, as it places the technical burden on both transmitting and receiving,[104] i.e., both flexible use and FSS, not just one service.

164. The Department should strongly reject any proposals, like Corus, to add a distance trigger. As we highlight in our comments, the U.S. approach to

[104] CBC/Radio-Canada Comments, pg 16.

coexistence is preferable due to the certainty the engineering guidelines provide over the simplicity of a distance-based approach. The Department should be careful not to adopt unduly restrictive protection measures on flexible use deployments, which could slow the rollout of advanced 5G connectivity, especially in more rural areas adjacent to satellite-dependent areas.

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/m^2/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?

165. Again, there is broad, cross industry support for adopting the U.S. value, including amongst flexible use operators (Bell, Shaw, Telus), several satellite operators (Eutelsat, Telesat), and other commenters (Mobilexchange, Department of National Defence, Toronto Police Services). Rogers continues to support the adoption of the U.S. approach, as this methodology sets clear, maximum pfd limits for flexible use operators.

166. We agree with Iristel, that a little extra effort in coordination that avoids unnecessary restrictions on flexible use deployments is preferable to a very simple coordination process that will prevent deployments that should not be prevented.[105] Separation distance as a coordination trigger, while simplistic in approach, would result in an undue constraint on flexible use deployments and an unnecessary administrative burden for both FSS earth stations and flexible use operators. SES and the PSBN Innovation Alliance's proposal for adoption of a distance trigger, as well as TekSavvy and CanWISP's support for a hybrid approach (pfd and separation distances), should be strongly rejected.[106]

167. Rogers has consistently supported that, at least in the short-term, Canada's Far North may have different FSS C-band demands. However, the Department should reject Intelsat's proposal for a pfd limit of -134 dBW/MHz/m^2 due to differences in

[105] Iristel Comments, para 114.
[106] SES Comments, pg 30.

Canadian earth station antenna angles as being unfairly and overly constraining on flexible use deployment. While the specific values could be determined as part of a future process at the RABC, we believe that, in satellite-dependant areas, a sliding scale pfd limit could be used based on the elevation angle, whereby earth station operators would disclose their elevation angle in the SMS database. This proposal would also address CBC/Radio-Canada's concerns to compensate for the reception gain of FSS antennas on the horizon at latitudes above 60° N.[107]

Table 1. Example values of sliding scale pfd limits, in satellite-dependent areas north of 60° N

Elevation Angle	dBW/MHz/m^2
$\geq 19^o$	-124
$\geq 15^o$	-127
$\geq 11^o$	-130
$\geq 9^o$	-131.5
$\geq 6^o$	-134

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?

168. Rogers fully supports Bell's proposal that ISED adopt FCC limits where earth stations have installed filters; however, as also endorsed by the FCC, where an FSS earth station has not installed filters and a flexible use licensee can demonstrate that it satisfies the blocking pfd limits, the earth station operator must accept any interference.[108] While new flexible use operators must be good spectral neighbours, legacy FSS earth station operators must also contribute to fair coexistence. Otherwise, there was broad, cross industry support for using the FCC assumptions, including Eutelsat, Intelsat, SES, and Telesat.[109]

[107] CBC/Radio-Canada Comments, pg 19.
[108] Bell Comments, para 103.
[109] Eutelsat Comment, para A50; Intelsat Comments, pg 35; SES Comments, pg 31-32; Telesat Comments, para 151.

169. The Department should reject Corus and the North American Broadcasters Association proposal to apply more constraints on flexible use, as their proposals rely on recommendations made to and subsequently rejected by the FCC.[110] As they offer no new arguments or evidence, and would obstruct crucial new flexible use deployments, they make little sense for Canada to adopt.

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?

170. Nearly all commenters on this question fully support the Department's 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. Only two radionavigation stakeholders suggest that additional measures may be needed beyond the 220 MHz separation based on a recent study (of worst-case scenarios) conducted by the radionavigation industry.[111]

171. As we highlight in our comments, there is no consensus between stakeholder industries on the report produced by the radionavigation community – and no additional support is provided in the comments. Further, our understanding is that some degree of non-consensus exists between radionavigation stakeholders. While we continue to conduct our own review of the recently released study, we believe that studies with more realistic scenarios would be required to support investigating whether additional technical requirements may be needed to manage coexistence between systems with 220 MHz separation at 4 GHz.

[110] Corus Comments, pg 16; North American Broadcasters Association Comments, pg 12.
[111] Boeing Company, Air Line Pilots Association, International (ALPA), Canadian Business Aviation Association (CBAA), Bombardier Aerospace, MHI RJ Aviation Group (MHIRJ), Air Canada Pilots Association (ACPA), Collins Aerospace, and the International Air Transport Association (IATA) Comments, pg 1-2; Transport Canada Civil Aviation Comments, pg 3.

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.

172. There is a lack of evidence or convincing arguments put forward in response to Q52 that would alter the view that the best overall outcome for competition policy in the Canadian mobile industry will require efforts to minimize fragmentation and the use of spectrum caps, not set-asides, to ensure that all networks have the opportunity to acquire large, contiguous blocks of spectrum. Robust facilities-based competition at the national level will continue to drive the quick and wide adoption of advanced communication technologies for the benefit of all Canadians, including those in rural Canada. Spectrum caps applied at the network level will also ensure ongoing vigorous competition between the national networks, the Rogers and the Bell-Telus ("Belus") joint network.

173. Spectrum caps will also ensure that regional competition is maintained without providing unintentional benefits to the Belus network. Avoiding the taxpayer financial subsidization of well-capitalized telecommunications conglomerates that set-asides provide will also remove the pernicious incentives for regional operators to drive up spectrum costs for national carriers, resulting in less capital for deployments (especially in rural areas) and ultimately higher costs for the majority of Canadians. For clarity, set-asides are not helping rural Canadians get enhanced coverage and improved network quality, rather, they are resulting in less spectrum and capital for the national network operators, the ones most likely to provide additional coverage and capacity in rural Canada.

174. It is telling that even companies like TekSavvy, who does support set-asides, suggests (incorrectly) that they are required to ensure WISPs' "access to **affordable**, secure spectrum"[112] (emphasis added). Well designed spectrum caps would ensure access to spectrum for large national operators and both small regional and rural WISPs, while also ensuring fair and affordable spectrum prices for all operators.

175. Since 2008's AWS-1 auction, auction rules have been put into place to help regional carriers, even with the evidence of growing harms to national operators and the mobile consumers they serve. Regional carriers continue to propose larger and larger set-asides paired with lower and lower opening prices, with the sole goal

[112] TekSavvy Comments, para a52.

to ensure they are able to secure spectrum at the lowest possible cost while still being able to price drive national operators. The bidding behaviour of Shaw and Quebecor in the 600 MHz auction resulted in significant and unnecessary pricing penalties for national operators – especially Telus, with no resulting gains for rural customers in areas like British Columbia or Alberta. Thus, it is unsurprising to see both regional carriers again effectively request that ISED guarantee themselves low-cost spectrum with the ability to price drive national operators (and, to some extent, Shaw to price drive Quebecor).

176. It is, however, somewhat surprising that Shaw has again tried to use regional carriers' spectrum holdings weighted on a national basis as evidence of a mid-band spectrum imbalance. This baseless argument was thoroughly debunked in the 3500 MHz auction consultation. As we have previously stated, Shaw provides limited coverage in just three provinces, while Rogers provides national network coverage from coast to coast. Thus, any meaningful assessment of spectrum holdings needs to be done at a regional level, as shown below in Table 2.

177. The best example of this is SaskTel, who Shaw states has just 0.5% of national mid-band spectrum. However, SaskTel hold's 30% of mid-band spectrum in Saskatchewan. Far from being spectrum poor, SaskTel is tied for the highest percentage of mid-band spectrum of any mobile network in their area of operation.[113] SaskTel is a Crown Corporation in the province of Saskatchewan – Saskatchewan is literally in their company name – and yet Shaw believes it is important to highlight that SaskTel does not have significant (any) spectrum assets in Vancouver or Montreal or Yellowknife, i.e., nationally. If this is the strength of Shaw's "evidence" for yet another set-aside for their shareholders financial benefit, Shaw seems to have instead fully proven that the 600 MHz set-aside was the last auction with any scrap of potential justification for the use of set-asides. The use of a set-aside in the 3500 MHz auction will again result in the same price driving behaviour we have seen documented in previous auctions' bidding data and must be the last set-aside to benefit regional carriers (shareholders) at the unfair and undue costs to national networks and the majority of Canadian mobile consumers. The Department has all of the evidence it requires to justify a rejection of the continued use of set-asides.

[113] While Canada's largest mobile operator, Rogers, holds 30% in some operating areas, we hold less than 30% across our entire operating area. As such, SaskTel has the most concentrated mid-band spectrum holdings in Canada when weighted for operating areas.

Table 2. Comparison of Regional Mid-Band Spectrum Holdings (Weighted MHz/Pop)

Tier #	Name	Rogers	Bell	Telus	SaskTel	Videotron	Eastlink	Shaw	Xplornet	Other
2-001	NFLD	23%	25%	21%			15%		16%	
2-002	NS	23%	23%	22%			15%		16%	
2-003	NB	24%	24%	20%			15%		16%	
2-004	EQ	25%	18%	31%		18%			5%	3%
2-005	SQ	26%	17%	33%		18%			2%	4%
2-006	EO	26%	17%	32%		12%		4%	5%	4%
2-007	NQ	16%	23%	18%		21%			14%	4%
2-008	SO	30%	25%	23%				12%	2%	8%
2-009	NO	24%	23%	24%			10%		14%	5%
2-010	MB	23%	21%	34%					18%	2%
2-011	SK	23%	4%	28%	30%				17%	
2-012	AL	27%	18%	28%			0%	14%	9%	3%
2-013	BC	30%	20%	28%				13%	4%	4%

Notes: PCS, AWS-1, AWS-3, AWS-4, WCS, BRS included. Orion WCS spectrum split 50/50 between Rogers and Bell. AWS-4 subordinate licences are included with Telus and Xplornet holdings. Other includes Tbaytel, Cogeco, and other smaller regional operators. Licences held on a smaller tier than Tier 2 are population weighted to Tier 2 region.

178. BC Broadband Association, similar to Rogers, calls for a spectrum cap to apply across the greater 3450-4200 MHz band.[114] Rogers does not support their proposed cap level, nor the use of future set-asides, but is otherwise directionally aligned. Again, it is important that the spectrum cap be applied at the network-level and be used to screen spectrum subordination requests to prevent separate companies acquiring spectrum to the cap at auction and then immediately circumventing it within a joint network.

179. Such a spectrum cap applied at the network level is critical, as even Telus is calling for a spectrum cap to be applied against the entire 3450-3900 MHz exclusively licensed band (as proposed by ISED). We agree with their view that a spectrum cap will result in an "effective set-aside" of various levels, depending on the ultimate cap size, and that spectrum caps can moderate prices, which will support affordability and investment.[115] However, Telus' proposed spectrum cap is structured in such a way that its intent is to guarantee the Belus network will have access to double the spectrum as any other network and they, along with their network partner Bell, will be able to create a permanent structural advantage for

[114] BC Broadband Association Comments, para 60.
[115] Telus Comments, para 204-205.

themselves to the determinant of long-term mobile competition in Canada, hurting Canadians and the Canadian economy.

180. Thus, the Department must strongly reject Telus' proposal for a "one-size-fits-all mid-band TDD aggregation limit to ensure four operators in each region have access to a meaningful amount of this spectrum to promote 5G competition."[116] While Rogers could support a "one-size-fits-all" spectrum cap applied at the network level (including to screen for spectrum subordination requests meant to circumvent auction caps), a far superior spectrum cap would provide differential spectrum caps applied to individual operators and joint networks. This would still allow joint network operators (i.e., Bell and Telus) to combine more spectrum than each would be individually entitled to but not double the amount of spectrum available to single network operators.

181. As a clear example, Telus suggests an appropriate cap might be all the available spectrum equally divided between 4 carriers. Under such a scenario, they believe that in a hypothetical division of spectrum in Tier 4-77 Toronto that it would be appropriate for Belus network = 225 MHz; Rogers network = 112.5 MHz; Shaw/Freedom network = 112.5 MHz. According to the CRTC 2019 Monitoring Report, Rogers had a 46% market share versus Belus' combined 52% market share.[117] For clarity, Telus proposes to give their Belus joint network a 100% advantage in spectrum assignment over the Rogers network to accommodate just 6% more mobile customers. It is clearly an unwarranted and anti-competitive proposal.

182. The Department should contrast Telus' effective 3300-4200 MHz proposal to Rogers' proposal in the 3500 MHz auction consultation, where with 200 MHz of spectrum available we proposed that ISED should apply a 60 MHz spectrum cap on individual operators and an 80 MHz spectrum cap on joint networks where multiple carriers combine their spectrum into one network. A hypothetical division of 3500 MHz spectrum in Tier 4-77 Toronto would be: Belus network = 80 MHz; Rogers network = 60 MHz; and, Shaw/Freedom network = 60 MHz. Under this hypothetical outcome, Telus and Bell would be able to still have a combined 33% more spectrum than Rogers, providing a more than equitable (though not equal) spectrum assignment. Rogers' spectrum cap is clearly the pro-competitive option and provides the Department with an appropriate model for the 3800 MHz licensing consultation.

[116] Telus Comments, para 203.
[117] CRTC, *Communications Monitoring Report – 2019*; https://crtc.gc.ca/eng/publications/reports/policymonitoring/2019/cmr10.htm#a2.

183. Telus provides Rogers' 600 MHz auction results as a reason that an operator-applied spectrum cap is needed. However, this is a red herring argument that the Department can easily see through. First, we proposed a spectrum cap for the 600 MHz auction to prevent the Belus network from foreclosing the open 600 MHz spectrum. Second, while Rogers is extremely pleased with the outcome, we have previously noted that it might not be the best overall policy outcome for Canada, but one that the Department explicitly chose to allow. Third, the 600 MHz auction outcome is the result of Bell and Telus' bidding strategies and actions, coupled with irrational bidding behaviour by regional carriers that appeared aimed at increasing prices for national players, rather than winning spectrum. Rogers conducted a consistent, straightforward bid strategy and secured the spectrum available to us within the competition framework set by ISED. This is not to say that Rogers believes that ISED's framework with no caps was appropriate.

184. The Department should not make an overly simplistic policy (over-) correction that would result in a greater future policy failure. The Department should strongly reject Telus' proposed spectrum cap that is designed to benefit the Belus network at the expense of all other facilities-based competitors, and specifically disadvantages the Rogers' network, which serves the most Canadian mobile consumers of any single operator. It would undermine competition in the provision of 5G services in Canada and would harm consumers.

185. For clarity, again, Rogers does not suggest that two network operators cannot share spectrum in a joint network – especially in rural locations with challenging economics where sharing can be quite beneficial – simply that there needs to be the application of a spectrum cap at the network-level to prevent individual bidders circumventing auction caps.

186. As stated above and in our comments, fragmentation of the greater 3300-4200 MHz flexible use band is also of great concern and excessive fragmentation would have extremely negative consequences for the ability of Canadians to achieve high-quality 5G services, as well as raising the costs of any 5G services. We support Telus' proposal for the Department to hold an assignment stage with guaranteed contiguity across 3450-3900 MHz, and that the best policy option is for ISED to incorporate the 3650-3900 MHz (or 3650-3980 MHz, should ISED move WBS to 3400-3450 MHz) into the 3500 MHz auction.[118] Such policy actions will enable a single joint assignment stage that will create contiguous blocks from 3450-3980 MHz and, when coupled with an effective network-level spectrum cap,

[118] Telus Comments, para 191-192.

set Canada up for the same network success in the 5G era as we have had in the 4G LTE era.

187. We also support Telus' proposal, similar to Rogers, that if auctioning the entire 3800 MHz band (e.g., 3650-3980 MHz) as part of the 3500 MHz auction in June 2021 is unachievable, then ISED should auction the second, complete tranche of spectrum subject to a common assignment stage. Further, Rogers continues to support that if a common assignment stage is not adopted by the Department, then one of the proposals we put forward to support maximizing contiguity and assignment within expected IBWs (i.e., 200-300 MHz) should be adopted, which in our view have no downside relative to running two separate and uncoordinated frequency assignment bidding stages for the two auctions. Further, to ensure all auction participants are able to finalize auction and future deployment strategies, Telus echoes Rogers view that the Department must provide clarity to auction participants before the 3500 MHz auction regarding how the various tranches of the 3800 MHz spectrum will be released, assigned and transitioned.[119] Spectrum clarity, as early as possible, is critical for network operators to make appropriate investment decisions now, in order to not unduly delay network deployments.

188. The Department should strongly reject Cogeco's proposal to have a set-aside and a cap within the set-aside.[120] As Rogers has proven repeatedly, the goal of the Department should be to reduce spectral fragmentation, not find ways to increase it even more in order to benefit those who continually show minimal actual progress in mobile network deployments and instead prioritize proposals to maximize regulatory arbitrage.

189. The Department also should strongly reject the proposal by Toronto Police Services and PSBN Innovation Alliance to have a set-aside or "priority use" allocation for public safety organizations. As highlighted above, emergency first responders already have the ability to get priority access to commercial mobile networks from Rogers and other carriers. Taking spectrum away from commercial mobile networks would only strand the spectrum and hurt the access and network capabilities available to public safety organizations.

190. Finally, as supported by regional mobile operators, all satellite operators (excepting Telesat), broadcasters, and numerous rural network operators the Department should not adopt the Telesat proposal to manage the spectrum transition and sale processes. The limited benefits, however, include showing that

[119] Telus Comments, para 201.
[120] Cogeco Comments, para 77.

in the mid- to long-term, clearing FSS up to 4100 MHz (or completely out of the C-band) and an accelerated clearing schedule is possible. The Department should instead move forward with an ISED-led process of the fundamental reallocation of spectrum from satellite services to terrestrial flexible use.

Q53: ISED is seeking general comments on the proposal submitted by Telesat found in annex H, including whether such an approach would be in the best interest of Canadians and more specifically, whether it would result in the faster deployment of 5G services in the affected frequencies; more efficient use of spectrum and what the implications of this repurposing plan would be for other users of the band.

191. The Telesat proposal in annex H of the Consultation is opposed by a broad, cross industry consensus with opposition from regional mobile carriers, satellite operators, broadcasters who currently use C-band FSS services, and rural network operators,[121] a position that Rogers fully supports. In fact, only a very limited number of respondents' voice support for the proposal, including Bell, some public safety-related entities, and TekSavvy. Further, for certainty, no satellite operator, excepting Telesat, supports the proposal. No evidence is offered, nor convincing arguments made, showing that such an approach would not ultimately only be in the best interests of Telesat, nor counter its potentially negative impacts on the interests of Canadians in the short and long term.

192. As stated above, Rogers supports Telesat's core proposal regarding gaining access to proceeds from the 3800 MHz auction (on this occasion, to support the satellite industry in Canada), on the basis that that ISED will manage all aspects of the Policy, Framework, and processes with regard to the sale of spectrum 3800 MHz band, and subject to the following specific conditions:

- It is ISED's sole decision as to whether and how the satellite operators (Telesat and all other satellite operators in Canada) are compensated;
- Any such compensation should be a one-time event;

[121] Eastlink Comments, para 15; Cogeco Comments, para 96; Corus Comments, pg 18; CBC/Radio-Canada Comments, pg 20; Ecotel Comments, para 130; Eutelsat Comments, para A53.1; Hunter Communications Comments, pg 2; Intelsat Comments, pg 36; Iristel Comments, para 121; SES Comments, pg 32-33; Shaw Comments, para 125; SSi Micro Comments, para 79; Xplornet Comments, para 77; North American Broadcasters Association Comments, pg 15; CanWISP Comments, pg 28; BC Broadband Association Comments, para 64; SaskTel Comments, pg 40; Quebecor Comments, para 92-93.

- ISED should be fully responsible for all aspects of the auction Framework (auction design, rules, eligibility etc.) for the release of the C-band spectrum between 3700-3980 MHz and the remainder of the C-band from 4000-4200 MHz;
- ISED should be fully responsible for all aspects of auction Policy (set-asides, caps, clearing, timing, licence conditions, WBS band (re)allocation, etc.);
- The U.S. C-band Clearing Schedule and allocations be adopted;
- ISED adopts an accelerated auction timeline for the 3700-3980 MHz allocation (in the form of one or two sequential auctions), such that the satellite operators (Telesat and all other satellite operators in Canada) can be compensated and that there is certainty for the mobile industry with regard to frequency assignment; and,
- ISED provides clarity as to the WBS allocation at 3650-3700 MHz.

193. Numerous commenters, including Eastlink, Ecotel, Iristel, Quebecor, SaskTel, and Xplornet echo Rogers' concerns that Telesat's proposal amounts to a very substantial shift in the fundamental basis of allocating spectrum in Canada and would create a precedent of the Department relinquishing responsibility for spectrum management to a private company.

194. The comments do show that there is some disagreement that the Telesat proposal would ultimately result in the faster deployment of 5G services, nor that it is a more efficient use of spectrum.[122] No evidence is provided that supports the claim that Telesat could successfully repack and clear the band faster than the U.S. operators, even in major urban markets of non-satellite-dependent areas. Further, no comments address the issue that private sales/transfers completed in sequential order would violate the spirit of Department's "no head start" rule applied to 3500 MHz FWA licensees eligible for 3500 MHz flexible use licences. If ISED simply withheld consent for all transfers until all proposed transactions in all service areas were completed, it could result in the timeline being extended near indefinitely.

195. As Rogers highlights in our comments, the Telesat proposal also seems likely to result in maximum fragmentation with no clear path to rationalizing the greater 3300-4200 MHz flexible use band. Telus, who appears neutral on the proposal, also highlights that Telesat's proposal would see three separate auctions for 3500 MHz and 3800 MHz spectrum, "resulting in operators holding licences for slivers of spectrum throughout the band".[123] Even if ultimately "only" three auctions, it would

[122] Cogeco Comments, para 95; Iristel Comments, para 120; Shaw Comments, para 125.
[123] Telus Comments, para 211.

still result in (at least) four flexible use sub-bands for the greater 3300-4200 MHz band: 3500 MHz band (3450-3650 MHz); Displaced WBS band (3650-3700 MHz); Telesat Private Auction band (3700-3900 MHz); and, Telesat-ISED Auction band (3900-4000 MHz), plus Relocated WBS band (4000-4080 MHz). Such actions will lead to fragmented and massively inefficient spectrum assignments. Even should the Department attempt to rationalize the spectrum, it will result in a very disruptive iterative process (re-assigning after each auction) or significant delays in investment and deployment as operators are uncertain what spectrum frequencies will ultimately be assigned at the end of the process. Neither of these outcomes will be good for Canadians or the Canadian economy.

196. In the event that the Telesat proposal were to be adopted, regional carriers and rural operators stress the need for competition measures. Preferred policy options do not materially differ from those proposed under an ISED-led process. However, no proposal or evidence is offered that allays our concerns that competition measures imposed by the Department and enacted by Telesat may directly contribute to increased fragmentation or highly asymmetric holdings in the band. Bell and Telus recommend either no competition measures or ones that effectively favour the joint Belus network. Regional carriers and rural operators advocate for set-asides of varying sizes in order to guarantee themselves low cost spectrum, often proposing that they would receive 100 MHz (or more) of contiguous spectrum for their much sparser customer densities even if that means the national networks that service the majority of Canadians would not be able to obtain similar amounts of spectrum. Neither of these results are good for long term mobile competition in Canada.

197. Whether ISED-led or the Telesat proposal, Rogers continues to be the only party to propose competition measures meant to ensure an equitable, though not necessarily equal, distribution of spectrum for both national networks and regional operators. A differentiated in-band spectrum cap applied against both individual operators and joint networks ensures fair treatment for all competitors. While we recognize that this is a good policy option for Rogers, it does not unduly penalize any facilities-based competition, recognizing that joint national networks (i.e., Belus) may acquire additional spectrum when competing against single-network national operators (i.e., Rogers), while also ensuring sufficient spectrum is available for regional carriers and rural operators but eliminating their incentives for price driving national operators. Setting caps at the right levels will also ensure that auction competition is preserved, thus protecting government revenues, while also ensuring all network operators have sufficient capital resources to continue investing in Canada’s world-class facilities-based networks.

198. It is telling that no other satellite operator or FSS C-band customer endorses the Telesat proposal, particularly on the technical side. Neither Corus nor the North American Broadcasters Association believes that 100 MHz is sufficient for programming needs, nor does the proposal deal with how 200 MHz of U.S. FSS broadcasting signals will be coordinated in 100 MHz of Canadian earth stations.[124] CBC/Radio-Canada highlights the Telesat proposal is not a contract and is also concerned that the proposal would not account for the already in-progress CBC/Radio-Canada move to 4000-4100 MHz.[125] Eutelsat opposes the idea that only Telesat can facilitate the FSS displacement. Intelsat states their concerns with "the role that Telesat appropriates for itself in the migration of all C-band users, including customers of competing C-band providers."[126] SES states that, "proper accelerated clearing of the 3700-4000 MHz band requires the concerted effort of multiple FSS operators, each orchestrating the move with their own customers, and cannot be left to Telesat alone."[127]

199. The few supporters of the Telesat proposal also offer no counter to these very legitimate technical concerns, simply saying Telesat should figure it out. Telesat itself offers no evidence or counter argument to any of these positions. The Department should not relegate Canadian spectrum policy to such an ad hoc approach, the potential uncertainty could create significant drag on the mobile wireless competition and deployment for several additional years.

200. The one main consensus amongst satellite operators is that they should all be recipients of any transition funding, and they object to Telesat to be the only FSS operator to receive compensation. With such an asymmetric approach to transition funding and potential compensation, the Telesat proposal could suffer from protracted domestic and international legal actions, again unduly delaying flexible use in 3800 MHz. For certainty, Rogers continues to support all FSS operators to receive funding for appropriate and valid transition costs in order to match the U.S. clearing schedule and making the spectrum available to flexible use operators in a timely manner.

201. In summary, Rogers sees no new evidence or arguments that suggest Telesat's proposal is optimal for Canadian wireless competition policy. We continue to recommend that Department not proceed with Telesat managing the spectrum

[124] Corus Comments, pg 18; North American Broadcasters Association Comments, pg 15.
[125] CBC/Radio-Canada Comments, pg 20.
[126] Intelsat Comments, pg 36.
[127] SES Comments, pg 33.

transition and sale process, though we fully support that satellite operators receive transition funding.

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

202. As to be expected, whether a commenter believes that the Telesat proposal would support rural/remote connectivity, promote competition in mobile services, or make more mid-band spectrum available to support 5G services largely depends on whether they support the Telesat proposal. As such, the greater majority do not believe that Telesat proposal meets ISED's policy objectives, nor that it is in the best interest of Canada.

203. PSBN Innovation Alliance believes competition would be the outcome of numerous auctions and private sales, coupled with multiple set-asides for "new entrants" as well as municipalities and public safety.[128] Rogers has highlighted throughout our comments and reply comments the negative impact that fragmentation will have on mobile competition, with rural/remote communities most penalized. This proposal would result in hyper-excessive fragmentation and should be firmly rejected. Similarly, Telus also highlights that the Telesat proposal falls short by ignoring the displacement of WBS to achieve contiguity across the 3500 MHz and 3800 MHz bands, as well proposing three auctions,[129] which could potentially be as much more (e.g., 3500 MHz; ISED 3650-3700 MHz; Telesat 3700-3900 MHz; ISED 3900-4000 MHz).

204. No new evidence or convincing arguments are put forward suggesting that Telesat's proposal will meet ISED's policy objectives outlined in section 3. They will, in fact, hurt the goals of supporting rural/remote connectivity and promoting competition in mobile services, while effectively making no more mid-band spectrum available to support 5G services.

[128] PSBN Innovation Alliance Comments, para 160.
[129] Telus Comments, para 212.

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

205. Most respondents take the opportunity to reinforce the negative elements of the Telesat proposal they identified in responding to above questions. Shaw further highlights that seeking comments on the consultation issues that would have to change if the Department were to adopt the Telesat proposal, “illustrates the impracticability of the Clearing Proposal and its sequencing with the current proceeding” and that "nearly every element in sections 7 through 10 would need to be adjusted if Telesat’s proposal were to be adopted”.[130] We concur that there would be numerous impacts, and believe most of them to be negative.

206. However, it should again be noted that the Telesat proposal provides some evidence that only 4100-4200 MHz is actually required in the long-term for FSS in the C-band. As such, there should be little issue in quickly repacking all current FSS operations Canada-wide into 4000-4200 MHz.

207. The radionavigation stakeholders both highlight that the Telesat proposal would further reduce separation and could increase the potential for impacts to aviation operations in Canada.[131] While Rogers still supports the long-term movement of

[130] Shaw Comments, para 126.
[131] Boeing, et all Comments, pg 3.

flexible use upwards in the band, we also support further studies to full understand any potential impacts and required mitigation strategies, as supported by RABC.[132]

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

208. Most commenters broadly support that the Department should adopt similar conditions of licence as with the 3500 MHz Framework, subject to various minor variations. Rogers continues to support the modifications we proposed in the 3500 MHz Licensing Consultation, with deployment timelines and levels being adjusted based on any potential restraints on flexible use deployment resulting from misalignment of Canadian and U.S. FSS clearing timelines. While we believe that the timelines and coverage requirements should be harmonized between the 3500 MHz and 3800 MHz bands, Rogers agrees with SaskTel's clarification that the actual deadlines should not be harmonized and deployment requirements must be based on the initial issuance date (to the flexible use operator).[133]

209. Telus recommends that under the Telesat proposal all approved transfers should have a Condition of Licence that frequency assignment will change in an upcoming process, which should include an overall assignment stage covering 3450-3900

[132] RABC Comments, para 110.
[133] SaskTel Comments, pg 50.

MHz using Tier 4 areas.[134] Rogers continues to support the Department taking steps to ensure the broader 3300-4200 MHz band, whatever the final flexible use range, is rationalized in order to minimize fragmentation.

210. The Department should reject requests to issue primary Tier 5 licences in the 3800 MHz band, whether through an ISED or Telesat auction process. We continue to generally believe Tier 5 service areas are best suited to frequencies above 6 GHz, and likely mmWave bands and above, until better coordination tools and advancements in technology make interference mitigation technically and economically feasible in low and mid-band spectrum. Should rural providers be looking to access spectrum, they should continue to seek commercially negotiated subordination, particularly from regional carriers that generally have limited deployments outside of large and medium urban population centres and have been the beneficiaries of significant previous set-asides.

[134] Telus Comments, para 227.

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

211. Commenters largely adopt the same positions under a hypothetical Telesat-led private sale/auction as they do under the ISED proposal. Bell suggests no competition measures and the regional carriers and rural network operators suggest measures to give themselves significant contiguous, low-cost spectrum at the expense of all others. These proposals, with no acknowledgment of the impact on wider industry competition, would have such negative short and long-term impacts that they can and should be completely dismissed by the Department.

212. CanWISP and Telus again propose a spectrum cap applied across the entire 3450-4200 MHz flexible use band. Rogers continues to view an in-band spectrum cap for the entire flexible use band (i.e., all 3500 MHz and 3800 MHz flexible use spectrum) as the best pro-competition option to achieve all of ISED and the Government of Canada's goals. However, that spectrum cap needs to be carefully designed to ensure that it does not unintentionally favour one bidder or network over another, perhaps maintaining auction competition but sacrificing long-term market competition. Thus, the spectrum cap must be applied at the network level and be used as a screen against any and all spectrum transfer and subordination requests.

213. The exact amount of a cap will ultimately depend on the amount of flexible use spectrum available as a result of this consultation and any technical constraints imposed on parts of the flexible use spectrum for coexistence with adjacent services. However, without the use of a well-designed spectrum cap applied to all

holdings in 3300-4200 MHz, it is unlikely that Canada will be able to obtain the Department's desired outcome of intense competition between multiple networks with large, contiguous holdings that are equitable, but not necessarily equal. Such a cap is even more critical in the 3500 and 3800 MHz bands, as these will be the first mid-band ranges that will support contiguous 100 MHz carriers.

214. Competition measures also cannot be haphazardly applied to portions of the band (e.g. 3450-3650 MHz, 3650-3700 MHz, 3700-3900 MHz, 3900-4100 MHz), as this will only exacerbate fragmentation, inefficient auction outcomes, and distortion to mobile competition. Excessive fragmentation risks a vicious cycle that would increase the short term and long term harms to the mobile industry and 5G, and ultimately to all Canadian consumers and businesses. Rogers also supports Telus' recommendation to have a final assignment across the entire flexible use range, including a guarantee of auto-contiguity, potentially as a Condition of Licence indicating that the frequency assignment will change in an upcoming process.[135]

215. As above, the Department should continue to reject all requests by public safety organizations for set-asides specifically for their operations. Emergency first responders already can receive priority mobile wireless services today and, in the case of municipal public sector needs, can continue to access WBS or other licence-exempt or lightly licensed bands. We again highlight that during this consultation, the Department has launched the 6 GHz Consultation, which could make even more licence-exempt or lightly licensed spectrum available.

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.

216. It is telling that the most common response to Q58 is that with such limited details provided that it is hard to comment – a view shared by those against Telesat's proposal (CBC/Radio-Canada, Iristel, Shaw, SSi Micro) and even some supporters (Bell, Department of National Defence). Further, there is absolutely no support from Intelsat, Eutelsat, or SES to allow Telesat to manage the transition process,[136] which continues to raise significant concerns over potential regulatory and legal actions that could significantly impact the timelines and availability of spectrum for flexible use licensees and remaining FSS customers.

[135] Telus Comments, para 234.

[136] Intelsat Comments, pg 40; Eutelsat Comments, para A58.2; SES Comments, pg 34.

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

217. CBC/Radio-Canada suggests that while filters could be built, they would be more expensive; SES highlights that there will be reduced economies of scale for FSS filters, as there would be different filters required in Canada versus US and Europe.[137] This seems to be supported by Intelsat's view that bandpass filters for 4100-4200 MHz with sharp roll off on either side can pose a significant technical challenge to be assessed.[138] Thus, while equipment may be possible, the Telesat proposal will increase transition costs to the Canadian satellite industry.

218. Huawei believes that building a single radio to cover the 3700-4100 MHz is a technical possibility, however, it will depend on the OOBE band plan and power and filtering requirements, with further technical study being required.[139] SaskTel raises concerns that a mobile ecosystem may not develop, as in their view the North American device ecosystem will be based on the U.S. band plan, which only extends up to 3980 MHz at this time.

219. Rogers does believe the ecosystem will eventually develop, though is still uncertain whether the trade-offs of extra costs and potential cross-border coordination issues would be a net-net benefit for Canada, at least in the short term. As such, we are aligned with Iristel and Shaw's view that the proposed

[137] CBC/Radio-Canada Comments, pg 24; SES Comments, pg 35.
[138] Intelsat Comments, pg 41.
[139] Huawei Comments, pg 6.

additional 100 MHz is not enough to counterbalance risks associated with implementing Telesat's proposal as is and that the purported benefits of the proposal are overstated.[140]

220. Rogers thanks the Department for the opportunity to share its views and participate in this consultation process.

[140] Shaw Comments, para 130; Iristel Comments, para 130.