



**Telesat**

**Comments for**

**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**

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## COMMENTS OF TELESAT

1 Telesat welcomes the opportunity to provide these Comments in response to the Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band, SLPB-002-20 (the “Consultation Document”)<sup>1</sup> issued by Innovation, Science and Economic Development Canada (“ISED or the Department”).

### **I. FAST TRACKING AFFORDABLE, CANADA-WIDE 5G AND UNIVERSAL CONNECTIVITY WITH 3800 MHz SPECTRUM**

2 Telesat strongly supports the policy objectives set out by ISED in the Consultation Document that will ensure all Canadians, businesses, and public institutions have access to world-class wireless telecommunications services as quickly as possible, at affordable prices.

3 For almost 50 years, Telesat has used, and continues to use, 3800 MHz spectrum to provide Fixed Satellite Services (FSS) to millions of Canadians from Coast-to-Coast-to-Coast, enabling core aspects of Canada’s broadcast distribution and communications infrastructure. Telesat has invested approximately C\$1.5 billion in facilities using the 3800 MHz spectrum to deliver critical, lifeline services to satellite-reliant and Indigenous communities (including telephony and broadband connectivity) as well as supporting essential public safety and other government services, including national security requirements across Canada. Telesat fully utilizes all 500 MHz of the 3800 MHz spectrum to deliver these vital services.

4 At the same time, Telesat recognizes that delivering affordable, world-class telecommunications to all Canadians in the era of 5G will require improved optimization of Canada’s scarce spectrum resources, including the important 3800 MHz spectrum band. Telesat believes that a portion of the 3800 MHz band could be repurposed for terrestrial flexible use, including 5G mobile wireless, to meet these critical policy objectives for Canadians. Such a change, however, would only be in the best interest of all Canadians if it is carried out in a

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<sup>1</sup> Published in the *Canada Gazette*, Part I, August 27, 2020 [*Consultation Document*].

coordinated, thoughtful way that protects and preserves the vitally important services that currently are supported on this spectrum.

5 The Consultation Document outlines two alternatives for industry comment. One that seeks to harmonize with the Federal Communications Commission (FCC) 3800 MHz band plan and seeks to adopt the FCC’s accelerated timeline of December 2023 but does not include, nor acknowledge, the essential elements of the FCC approach, namely making the satellite operators responsible for the transition and providing them full reimbursement of clearing costs and significant incentive payments to clear on this ambitious timeline (the “ISED Proposal”). The other proposal, put forward by Telesat (the “Telesat Proposal”), would meaningfully accelerate the deployment of affordable world class 5G and dramatically improve rural broadband connectivity across all of Canada and includes a commercially viable clearing mechanism that ensures the continuity of the vital services currently provided over 3800 MHz spectrum. Moreover, the Telesat proposal addresses the global competitive imbalance between Telesat and its already larger primary international competitors resulting from the FCC’s 3800 MHz process where Telesat’s two largest competitors will receive approximately C\$18 Billion to clear 25% less spectrum than Telesat proposes to clear in Canada.

6 Telesat recognizes the far-reaching and transformational benefits that making additional mid-band spectrum available for 5G on an accelerated timeline would bring to Canadians, specifically as it relates to broadband availability and wireless affordability. In recognition of these benefits, and in an effort to be a constructive industry partner, Telesat has developed a proposal, inspired by and consistent with ISED precedent<sup>2</sup>, where Telesat will clear 400 MHz of 3800 MHz spectrum, including 200 MHz to be cleared concurrently with the June 2021 3500 MHz auction process, doubling the amount of spectrum available for the initial deployment of

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<sup>2</sup> The Telesat Proposal is in line with a number of similar precedents from previous spectrum transitions. Most recently, in last year’s 3500 MHz Decision band incumbents Bell, Inukshuk, Rogers, TELUS and Xplornet retained 94%, 43%, 86%, 100% and 79% of their spectrum, respectively, on a population-weighted basis; with band incumbents retaining an average of 52% nationally, while converting these holdings from fixed wireless to more valuable flexible use licences. Previous transitions of 2500 MHz and AWS-4 spectrum have also added new, more valuable use rights onto existing licences held by incumbents. The Department has subsequently allowed those licensees to transfer those incremental rights to other eligible users through secondary market transactions. See, for example, the recent decision re: Subordination of spectrum licences held by TerreStar Solutions Inc. to TELUS Communications Inc., available online at <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11533.html>.

5G in Canada and enhancing sustained wireless carrier competition. The core principles of the Telesat Proposal will ensure Canada is in the best possible position to take full advantage of the immense promise of affordable 5G services. In particular, the Telesat Proposal ensures:

**A. 400 MHz of Critical 5G Spectrum Brought to Market Now**

7 The massive speed and capacity benefits of 5G are contingent upon the availability of the wide blocks of spectrum that 5G was designed to support – optimized for 100 MHz mid-band channels. The ISED Proposal would permanently compartmentalize rather than unify Canada’s scarce 5G spectrum resources. Specifically, ISED’s Proposal would not enable an auction of 3800 MHz<sup>3</sup> until well after the 3500 MHz auction and the spectrum would not be available for deployment until December 2023<sup>4</sup>.

8 This timeline would effectively require wireless carriers to acquire and deploy their 3500 MHz spectrum without knowing their 3800 MHz holdings. This would necessitate the carriers deploying equipment to launch on 3500 MHz spectrum (in 2021) and then be forced to duplicate that expensive process in order to launch on 3800 MHz spectrum (in 2024).

9 The high cost of duplicative infrastructure and the unnecessary strain on high-cost tower real estate will have a meaningful, direct and permanent negative impact on carriers’ network cost per Mbit. This approach is highly inefficient and costly. These increased costs to the carriers will almost certainly find their way into consumers’ bills. Telesat’s accelerated proposal avoids this problem by allowing wireless carriers to obtain 3800 MHz spectrum contemporaneously with the 3500 MHz auction<sup>5</sup> and **will meaningfully contribute towards the Government’s policy of wireless affordability and reducing wireless phone prices by 25%.**

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<sup>3</sup> <https://buyandsell.gc.ca/procurement-data/tender-notice/PW-20-00906604>

<sup>4</sup> Even then, achieving this date while maintaining the critical services provided on this spectrum is only achievable if someone is fully responsible, and provided with an appropriate commercially viable clearing mechanism, for clearing the spectrum.

<sup>5</sup> Given the significant supply and demand imbalance in the 3500 MHz spectrum auction slated for June 2021, coupled with the single, more coherent 5G infrastructure deployment plan outlined above, the most efficient spectrum roadmap would be for 3700-3900 MHz to be made available to the wireless carriers in advance of the 3500 MHz auction.

10 Furthermore, wireless carriers have a critical need to deploy 400 MHz of mid-band spectrum today. The Telesat Proposal provides an additional 200 MHz of spectrum that would be available for deployment on the same timeframe as the 3500 MHz spectrum band (*i.e.* Telesat has proposed that 3700 – 3900 MHz would be cleared and made available for 5G deployment on the same timeframe that ISED has already specified for the 3500 MHz spectrum band). Thus, the Telesat Proposal would double the amount of 5G spectrum available for carriers to use within the timeframe planned for the 3500 MHz deployment, supporting lower consumer costs, dramatically accelerating the speed and efficiency of Canadian 5G deployments, and positioning Canada as a global leader in affordable 5G worldwide.

**B. CRITICAL SERVICES PROVIDED TO CANADIANS ARE PROTECTED**

11 Today, Telesat is using all 500 MHz of 3800 MHz spectrum across three satellites providing critical services to Canadians in every province and territory. Ensuring critical services remain connected – both during the clearing process and thereafter – requires both a highly coordinated, costly, and technically challenging clearing process as well as alternate facilities, notably Telesat LEO, to which these services can transition. Such a transition will be complex and will require substantial investment and resources.

12 In the U.S., the FCC recognized the importance of this clearing process and established a transition plan that includes more than C\$18 Billion<sup>6</sup> in reimbursement of direct costs (including 13 new satellites for SES and Intelsat combined) and incentive payments to satellite operators using this spectrum in the U.S. These funds will almost entirely go to Telesat’s two largest competitors in the highly competitive, global satellite services market, companies that are already roughly four times larger than Telesat.<sup>7</sup>

13 In stark contrast to the FCC Decision, the ISED Proposal does not address at all how clearing this spectrum will occur and how critical services will be maintained during and after the clearing process.

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<sup>6</sup> In the FCC process, the satellite operators will receive US\$9.7 Billion in Accelerated Relocation Payments and US\$3.6 Billion in clearing costs, which include the full reimbursement of 13 new satellites to SES and Intelsat.

<sup>7</sup> See response to Q24, below, for additional details and references.

14 Furthermore, it is important to highlight that while the ISED Proposal protects the downlink of 3800 MHz in satellite dependent communities, it does not protect the downlink of the return links to the South. In fact, due to the complexity associated with clearing this spectrum, virtually all services require changes in order to maintain continuity, even under ISED's proposal<sup>8</sup>.

15 For the avoidance of doubt, unless there is a party that is both identified, and has the appropriate financial incentive, to do the work, then the steps necessary to protect vital services will not occur and when 5G launches in urban areas, vital services will go down across Canada.

16 Under the Telesat Proposal – as the sole C-band licensee – Telesat will take full financial and technical responsibility for the clearing process, ensuring that customers are protected and the spectrum is cleared on an accelerated timeline.

17 Specifically, Telesat has committed to investing all of the net proceeds from this process into new facilities and satellites, in particular Telesat's advanced Low Earth Orbit (LEO) satellite constellation Telesat LEO, which is a key component of Telesat's plan to clear 3800 MHz spectrum. Telesat LEO is the most ambitious and innovative project of Telesat's 50+ year history. Consisting of approximately 300 advanced satellites, Telesat LEO is a multi-billion dollar investment in a state-of-the-art, revolutionary LEO satellite constellation that will deliver affordable, fibre-like broadband connectivity and support the deployment of LTE and 5G everywhere on Earth, including to the entirety of Canada. Telesat LEO is a critical part of the

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<sup>8</sup> It is important to underscore that any assumption that the U.S. clearing process would facilitate a streamlined Canadian transition is false. As the RABC notes in their response to question Q9, the Canadian and U.S. usage of this spectrum is both fundamentally different and largely independent. Thus, the U.S. clearing process will simply not make it any easier to clear this spectrum in Canada. Moreover, because the U.S. has gone first, Canada cannot follow the U.S. approach to ensuring that critical services are maintained after the clearing. The U.S. approach is to use more satellites operating on less spectrum: SES and Intelsat are being reimbursed for the cost of 13 new satellites to do this. As a result, there are virtually no unoccupied satellite 3800 MHz orbital slots over North America. Therefore, Canada cannot maintain critical services by adding more satellites operating on less spectrum: there is simply nowhere to put them. Telesat would also note that in the RABC's response to Q9 it suggests that Canada could also follow this approach of having more satellites using less spectrum. While in theory this approach works - and in practice, it is what is being done in the U.S. - it is simply not practical for Canada to adopt this approach due to the lack of additional orbital locations at which to place 3800 MHz satellites. Telesat expands on this in its response to Q25.

plan to ensure that all services currently using 3800 MHz spectrum can continue to be provided during and after the transition.

**C. FACILITATES FUTURE AUCTION REVENUE FOR CANADA THROUGH CLEARING 3800 MHz SPECTRUM**

18 As Telesat noted above, it is using all 500 MHz of 3800 MHz spectrum today across three satellites providing essential services to Canadians. Given the importance of these services, it is inconceivable that this spectrum could be cleared and auctioned for 5G unless there is a clear path to seamlessly transition these users onto new facilities operating in different frequencies.

19 This is precisely the experience in the U.S. on clearing mid-band spectrum. Like in Canada, mid-band spectrum is already fully used for the delivery by satellite of important services, principally broadcast distribution. The FCC recognized that it was essential that these services be transitioned to alternative spectrum and facilities before the spectrum could be repurposed and auctioned for 5G and, moreover, that there must be financial compensation and incentives in place for that to occur. The FCC's Decision put those key financial mechanisms in place, ensuring the continuity of the critical services now using the band and clearing the way for the auction of substantial mid-band spectrum for 5G by year's end, which will result in significant proceeds for the U.S. Treasury.

20 ISED also will need to provide for the transition of current users before it can repurpose the mid-band spectrum for 5G and secure auction proceeds for the Canadian Treasury. The Telesat Proposal sets forth the only concrete, actionable path to transition and clear this spectrum in Canada, thereby enabling the Department to expeditiously provide much needed mid-band spectrum for 5G as well as the ability to auction a substantial portion of that spectrum in the future, resulting in what will be meaningful auction proceeds for the Canadian Treasury.

**D. SUPPORTS A QUICK, CONCLUSIVE DECISION FROM ISED, ACCELERATING AFFORDABLE WORLD CLASS 5G**

21 Telesat recognizes the complexity associated with defining the optimal path to repurpose the 3450-4200 MHz spectrum band and that the optimal path forward may involve incorporating elements of both proposals.



22 For Telesat, the essential aspects of its proposal are:

- a) 3700-3900 MHz being made available and cleared on an accelerated basis, contemporaneously with 3500 MHz, to provide 400 MHz of spectrum for the rollout of 5G on mid-band spectrum in Canada;
- b) Telesat's ability to monetize this spectrum and invest all of the net proceeds from this process into new facilities and satellites, including Telesat LEO; and
- c) Telesat ensuring that all customers receiving vital services over 3800 MHz spectrum today remain connected.

23 Outside of these three core aspects, Telesat is fully committed to working with all interested parties in a constructive, open, and effective way to identify and implement a solution that is in the best interests of all Canadians.

24 Accordingly, Telesat believes that the core elements of its proposal could be combined with certain elements of the ISED Proposal (*e.g.* addressing the future use of 3650-3700 MHz, ensuring mid-band spectrum (in addition to 3700 – 3900 MHz) is made available for affordable 5G, and fulfilling the core policy objectives as outlined in the Consultation Document) to produce a “best of both” decision in a timely and efficient manner, delivering and fast-tracking affordable, Canada-wide 5G and universal connectivity with the 3800 MHz spectrum band.

25 In addition to the manifold public policy objectives the Telesat Proposal advances, Telesat would also underscore that unlike other Canadian telecommunications and broadcasting undertakings that operate in a closed domestic market, Telesat operates in a fiercely competitive, global market where decisions made by foreign jurisdictions can have a significant impact on Telesat and the broader satellite industry at large. As noted above, in the case of 3800 MHz, the clearing plan adopted by the FCC will see the two largest global satellite operators receive ~C\$13 Billion (~US\$9.7 Billion) in clearing incentive payments in addition to an estimated ~C\$5 Billion (~US\$3.6 Billion) in clearing costs, which includes full cost recovery for the construction of 13 new satellites. Telesat competes with SES and Intelsat (each of which is already approximately four times larger than Telesat) in nearly every country in the world,

including in Canada<sup>9</sup>. It would be deeply prejudicial to Telesat's global competitive position if Telesat were required to clear 1/3 more spectrum in Canada than is being cleared in the U.S. – and on a more ambitious timeline – without an ability to receive meaningful economic value to offset the highly costly and technically challenging clearing process.

26 The long-term impact and realities of COVID-19 necessitate industry and governments coming together to find innovative and collaborative solutions to the challenges we face. The Government of Canada has long understood that universal connectivity is a necessity and COVID-19 has highlighted the criticality of affordable, high quality connectivity like never before. It is essential that Canada have access to universal, affordable world-class 5G technologies and high-speed Internet connectivity to position our citizens and our economy for success in the post-COVID global economy. Finally, the proliferation of 5G, coupled with the advent of Telesat LEO, will bring tremendous economic benefits and job creation to Canada at a time when stimulus has never been more important. For all of these reasons, accelerating the affordable deployment of 5G and positioning Canada at the forefront of the telecommunications and New Space sectors is, and must be, a top priority for the Government of Canada.

27 Given the significant benefits that launching affordable, world-class 5G and Telesat LEO will bring to Canada, Canadians, Canadian businesses and SMEs, it is imperative that the wireless industry and Telesat have clarity on the 5G spectrum roadmap as quickly as possible.

## **II. TELESAT'S COMMENTS ON SPECIFIC QUESTIONS POSED BY ISED**

28 In this section, Telesat will respond to a number of specific issues raised in the Consultation Document. Telesat has participated in the Radio Advisory Board of Canada's (RABC) development of common industry positions on many issues and Telesat endorses and adopts the positions set out in the RABC submissions, subject to the comments and exceptions set out below.

29 For convenience, the questions and issues set out in the Consultation Document are set out below, **highlighted in grey**, with Telesat's comments on each issue following.

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<sup>9</sup> See response to Q4, below, for additional details and references.

30 Where Telesat believes it does not have the technical or operational expertise to adequately address a question, it has simply noted “no response”.

**A. INTERNATIONAL CONTEXT**

**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

31 As demonstrated in the feedback from vendors described in the RABC submission, coupled with the release of Apple’s iPhone 12<sup>10</sup>, which will leverage sub 6 GHz spectrum, Telesat understands that there is a clear demand from carriers around the world for the development of an equipment ecosystem using 5G technologies in the 3800 MHz band. This reflects the strong demand, both in Canada and elsewhere, to use mid-band spectrum to deploy 5G services, which are poised to deliver tremendous improvements to wireless network performance. It is in fact this very market demand for affordable 5G services in Canada, combined with the reallocation of U.S. C-Band to 5G, that motivated and guided the development of Telesat’s proposal: the accelerated deployment of 5G nationally is a core purpose and fundamental advantage of the Telesat Proposal.

32 Furthermore, as outlined in the RABC submission, vendors have indicated that they fully intend and expect to respond to this demand in the required timelines. In particular, based on vendor feedback, Telesat expects that:

- a) both n77 (3300-4200 MHz) and n78 (3300-3800 MHz) equipment will be mature at the time of deployment of 3800 MHz in Canada; and

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<sup>10</sup><https://www.apple.com/iphone-12/specs/> and <https://www.apple.com/iphone-12-pro/specs/>

- b) base stations operating in the 3800 MHz band will likely be capable of handling multiple technologies and band classes at the same time on the same base station, offering flexibility to service providers.

**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

33 Telesat is not aware of any specific reason to conclude that a relatively small gap (for example, for the existing WBS band) would interfere with productive use of both bands for 5G technologies.

**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

34 No response.

**B. CHANGES TO THE SPECTRUM UTILIZATION FOR THE 3800 MHz BAND**

**Q4: ISED is seeking comments on the proposal to add a primary mobile service, except aeronautical mobile, allocation in the 3700-4000 MHz band to the CTFA and the specific changes shown in annex B.**

35 Although satellite operators in both the U.S. and Canada (including Telesat) are currently using the full 500 MHz of 3800 MHz spectrum from multiple orbital locations to deliver core broadcast, and mission critical voice and data connectivity services, Telesat recognizes that 5G represents one of the most promising technological and economic transformations in recent history. Mid-band spectrum, notably the 3800 MHz band, given its unique characteristics and properties, if made available in a timely manner, will be the foundation for ubiquitous, affordable 5G given its unique characteristics and properties.

36 For this reason, in principle, Telesat supports the Department's proposal to add a primary allocation for mobile service, except aeronautical mobile, in the 3700-4000 MHz band and to the Canadian Table of Frequency Allocations (CTFA) as given in Annex B of the Consultation. In fact, Telesat's proposal indicates that the mobile service could be extended by an additional 100 MHz, to the 3700-4100 MHz band.

37 However, it must be recognized that Telesat currently uses all of this spectrum to deliver vital services throughout Canada and it is impossible for satellite services to coexist with widespread terrestrial use of the band. The relatively weak satellite signals would be entirely overwhelmed by terrestrial emissions resulting in the loss of critical services to Canadians.

38 In order for services currently being delivered in the affected band to be preserved, they will have to be relocated to alternative spectrum. As described in paragraph 39 of the Telesat Proposal, this will require a multi-step process, including inter-dependent migration of services to new transponders on their existing satellite and/or moves to new satellites.

39 It is critical to note that, under the ISED Proposal, even services in satellite-dependent communities will be affected by the spectrum clearing process.

40 First, even if all of the 3800 MHz band is available for satellite services in the satellite reliant communities themselves, most of those services connect to areas where only 200 MHz (4000-4200 MHz) will be available for satellite services. In addition, there will be changes required even for those services that today use frequencies that under the ISED plan will

continue to be available for satellite. As Telesat engages in the highly complex plan to relocate services out of the cleared spectrum, it will need to optimize the use of the spectrum that remains available for satellite services. To do this, Telesat would have to change the spectrum used by virtually every customer and service.

41 This will be a highly complex and expensive undertaking. As noted in the Telesat Proposal, it is simply not commercially viable for Telesat to bear this cost, especially when its competitors are being compensated billions of dollars for the same type of costs as part of the 3800 MHz spectrum reallocation in the U.S. Nor should it be acceptable to prejudice the vital services provided to Canadians over this spectrum today.

42 As noted in the Executive Summary, Telesat operates in a fiercely competitive, global market. Decisions by regulators in other jurisdictions, such as the FCC, have a significant impact on Telesat and the satellite industry at large. In the case of 3800 MHz, the clearing plan adopted by the FCC will see the two largest global satellite operators receive ~C\$13 Billion (~US\$9.7 Billion) in clearing incentive payments in addition to an estimated ~C\$5 Billion (~US\$3.6 Billion) in clearing costs, which includes full cost recovery for the construction of 13 new satellites. Telesat competes with SES and Intelsat (each of which is already approximately four times larger than Telesat) in nearly every country in the world, including in Canada.

43 Since the March FCC Report and Order was released outlining the funds Intelsat and SES would be receiving, it should be noted that Intelsat – currently in bankruptcy – will be acquiring the Inflight Connectivity (IFC) provider GoGo for US\$400 Million in cash further integrating and growing Intelsat’s market share in the important aero connectivity sector. Similarly, SES has announced that it will be increasing the size of its Medium Earth Orbit (MEO) satellite constellation, mPower, by over 50%, which will increase the throughput of the entire mPower constellation by 90%.

44 It would be deeply prejudicial to Telesat's global competitive position if Telesat were required to relinquish the same amount of spectrum in Canada as in the U.S. – on an accelerated timeline – without an ability to receive meaningful economic value to offset the highly costly and technically challenging clearing process.

45 The Telesat Proposal has been carefully designed to create a win-win scenario in which Telesat can leverage capital funding from the terrestrial wireless industry and invest all of the net proceeds from this process into new facilities and satellites, particularly Telesat LEO. Telesat LEO will bring tremendous economic and social benefit to Canada helping to create and maintain approximately 1,000 jobs and bridging Canada's Digital Divide.

46 Moreover, the Telesat Proposal is the only actionable path forward for the Department to auction any part of the 3800 MHz spectrum band and realize any potential future auction proceeds to the Treasury without jeopardizing the vital services Canadians receive over this spectrum today.

47 For the avoidance of doubt, absent a commercially viable clearing mechanism, Telesat simply could not afford to facilitate the clearing of any meaningful amount of 3800 MHz spectrum and still maintain the vital services that it provides to millions of Canadians every day.

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

48 Telesat supports the Government's commitment to universal affordable access as a foundational element of establishing an innovative and inclusive digital economy. Furthermore, Telesat recognizes the Department's corresponding commitment that all Canadian consumers, businesses and public institutions have access to the latest wireless telecommunications services, at affordable prices. Finally, Telesat appreciates that facilitating the deployment and timely availability of these services to all Canadians, including those in rural, remote and Northern regions, is one of three key policy objectives underlying the Department's Consultation and clearly outlined in the Mandate Letters of multiple Ministers.

49 A flexible use licensing model would allow spectrum licensees to support both fixed and mobile wireless services in the 3650-4000 MHz band, in-line with market demand. As the FCC has noted, flexible use would allow markets to unlock enormous incremental economic value from the use of spectrum.<sup>11</sup> In regions where population density does not support economically

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<sup>11</sup> FCC, Report and Order and Order of Proposed Modification In the Matter of Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122, Adopted 28 February 2020, para. 20 ("The record in this proceeding makes

viable fibre-based high-speed broadband (*i.e.*, most of the Canadian landscape including millions of Canadians), telecommunications carriers could utilize 3800 MHz spectrum to substantially expand their high-speed fibre footprints through “last mile” delivery of broadband over fixed wireless. Flexible use licensing recognizes that while Canadians deserve both affordable and the best mobile 5G networks in the world, many Canadians still lack basic high speed broadband in their homes, schools and offices. A flexible use licensing model would help solve this important problem, enabling more Canadians to participate in the new, digital economy.

50 Telesat strongly supports the Government’s commitment to universal access and the Department’s commitment to facilitating service availability to all Canadians, and to that end supports a flexible use licensing model for the 3650-4000 MHz band, assuming that the band is reallocated to allow for both fixed and mobile terrestrial use. However, Telesat also wishes to underscore that “last mile” delivery of broadband over fixed wireless will not, in itself, enable universal access. Fibre-supplemented by fixed wireless requires a higher population density than can be economically supported across much of the Canadian landscape. Thus, affordable universal access – even within relatively populous regions in southern Canada – can only be achieved through the development of a range of technologies, including fibre, fixed and mobile wireless, and next generation satellite systems like Telesat LEO. In defining its plan for the allocation of the 3800 MHz band, Telesat encourages the Department to craft a solution that assures all Canadians have access to affordable high speed broadband, including Canadians that cannot be economically supported by fibre or fibre supplemented by fixed wireless.

**Q6: Given the proposal in section 7.2 on developing a flexible use licensing model for fixed and mobile services in the 3650-4000 MHz band, ISED is seeking comments on the proposal that no new FSS earth stations be authorized in the 3700-4000 MHz band in the future and that the authorization of new FSS earth station licences be limited to the 4000-4200 MHz band.**

51 Telesat does not believe that an absolute moratorium on new FSS earth station authorizations is either appropriate or necessary. In particular, to the extent that the Department

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clear that licensing mid-band spectrum for flexible use will lead to substantial economic gains, with some economists estimating billions of dollars in increases on spending, new jobs, and America’s economy.”)



determines that the full 500 MHz should continue to be available for FSS in some portions of the country, it would be both reasonable and beneficial to allow new earth stations in those areas.

52 There is also no reason to not allow new FSS earth stations to operate on a secondary basis. Allowing additional earth stations creates no risk of interference to terrestrial operations. Earth stations do not transmit in the 3800 MHz band and the received power levels of signals from FSS space stations are negligible by comparison to terrestrial transmissions and therefore do not create interference to terrestrial systems operating in this band. In fact, Telesat's satellites operating in the 3800 MHz band cover the whole of Canada. The amount of signal that will be received by a terrestrial base station is completely independent of the location of the receiving earth stations. Accordingly, as long as future earth stations are authorized on a secondary basis, they will have no impact on terrestrial use of the spectrum.

**Q7: ISED is seeking comments on the proposal to implement a 20 MHz guard band between 3980- 4000 MHz to protect FSS operations in 4000-4200 MHz band from proposed flexible use operations in the 3700-3980 MHz band.**

53 Continued FSS operations, whether in the 4000-4200 MHz band or 4100-4200 MHz band, would require protection from both out-of-band interference due to flexible use transmissions in the adjacent band. Telesat agrees that a 20 MHz guard band would be appropriate.

**Q8: ISED is seeking comments on the proposal to maintain a primary allocation to FSS in the entire 3700-4200 MHz band and the proposal that existing FSS earth stations in satellite-dependent areas remain licensed in the entire 3700-4200 MHz band.**

54 The Telesat Proposal supports the clearing of 400 MHz of 3800 MHz spectrum everywhere leaving 100 MHz (4100 - 4200 MHz) for FSS, except at two designated gateway sites where the full 500 MHz will continue to be required for FSS. A continuing co-primary allocation to FSS in the entire 3700-4200 MHz band will therefore be required.

55 Telesat also supports continued FSS use everywhere, on a secondary unprotected basis, across the full 500 MHz. In addition, since satellite-dependent areas are, in most cases, located in remote areas with low population densities where there may not be a business case for the provision of terrestrial flexible use services, conflicting demand and the potential for interference may be minimal. If ISED does not foresee the deployment of terrestrial flexible use services

across the 3800 MHz band in some or all of the satellite-dependent areas of the country, there would be no downside to allowing existing FSS earth stations in satellite-dependent areas to remain licensed in the entire 3700-4200 MHz band on a primary basis. This approach would allow for maximum flexibility and the most efficient use of spectrum.

56 In any case, it is essential that the entire 500 MHz of spectrum continue be available at two gateway locations so international communications continue to be received across the band, and so that satellite-dependent communities can be linked to Canada's backbone telecommunications networks. Gateway locations can be chosen to minimize the risk of interference. However, the sites require good connectivity to backbone networks and need to be accessible for skilled personnel. In addition, extensive investments have been made in existing facilities and it would be unrealistic and impractical to move those facilities simultaneous with a national clearing effort. Since a gateway may be located near more densely populated areas, frequency coordination and careful management of both the FSS and terrestrial flexible use locations and technical characteristics will be required.

**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

57 The trend towards use of higher frequencies for the provision of FSS services began in the 1980s with the introduction of commercial Ku-band services, and accelerated in the 2000s with the introduction of commercial Ka-band services. Telesat was the world leader in both cases. Today, Telesat offers commercial services to rural and remote areas of Canada at Ku-band on its Anik F1R, Anik F2 and Anik F3 and Nimiq satellites and at Ka-band on its Anik F2, Anik F3 and Telstar 19 VANTAGE high-throughput GEO satellites. Telesat's ambitious, next generation LEO satellite system, operating in Ka-band spectrum, will offer greatly increased broadband capacity and speeds with low latency worldwide, including in Canada's remote and currently underserved areas.

58 While Telesat believes some communities in rural and remote areas will transition to terrestrial communications over time, these instances will be relatively few in number. Given the transformational economics and capabilities of Telesat LEO, Telesat believes that the majority of remote communities will continue to be served by satellite communications for the foreseeable future and in most cases will move to a Telesat LEO solution.

59 Many of Telesat's broadcast and communications services that were originally carried on C-band have already transitioned to higher frequency bands. In addition, many of the broadcast signals originating from U.S. broadcasters are being distributed on fibre or Ku-band satellites to cable headends and IPTV service providers in Canada. At the macro level, we expect this trend of the development of new satellite alternatives to the use of C-band to continue.

60 Higher frequency bands have more spectrum available to FSS and enable more efficient frequency reuse and smaller earth station antennas. Commissioning of Telesat's LEO network, which is a key aspect of Telesat's clearing plan, will enable greatly improved services with higher throughput and lower latency than is currently achievable, and we anticipate further migration from C-band to Telesat LEO, in particular for satellite trunking/backhaul to rural and remote communities.

61 There are, however, some impediments to conversion. Significant investments have been made in C-band earth station infrastructure and there is substantial cost and logistical complexity involved in replacing it. This is particularly the case for earth stations located in remote areas, often accessible only by air and annual sealift. It is also important to recognize that, despite the transition to higher frequencies, there continues to be strong demand for C-band spectrum, in particular to deliver increasing amounts of broadband connectivity to remote and satellite reliant communities across Canada.

62 Telesat believes that with careful planning, adequate timeframes, and sufficient funding for the necessary costs, the majority of C-band services would be able to migrate, either to higher frequency bands on GEO, LEO and as outlined in the Telesat Proposal, into the top 100 MHz of C-band. If the Telesat Proposal is adopted without delay, Telesat believes this transition can be accomplished by the end of 2025.

**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.**

63 Satellite-dependent communities have low-population density and high costs to serve. The vast distance separating these Northern communities from the rest of Canada, the harsh terrain and frozen oceans makes the deployment and operations of typical terrestrial solutions extremely challenging and costly.

64 The only practical way to maintain current broadband connectivity in satellite-dependent communities while enabling flexible use of the same spectrum in other parts of the country is a carefully coordinated transition that will require substantial investment. For the avoidance of doubt, without the funding needed to invest in new facilities, Telesat would not be able to support these critical services without continuing to use the entire downlink bandwidth of the 3800 MHz band.

65 Furthermore, *maintaining* the current status quo would not be consistent with the Government of Canada's universal access policy goal. The status quo is, quite simply, failing to meet the needs of many Canadians.

66 Telesat believes that all Canadians deserve access to the highest quality broadband services at affordable rates. The COVID-19 pandemic has reinforced how essential such services are to the economy and to the well-being of Canadians. Canadians living in rural and remote areas are even more dependent on broadband communications for health care, education and their economic livelihood. It is essential that broadband services continue to be enhanced in satellite-dependent areas. The Telesat Proposal will achieve this, through the development and deployment of its advanced, next generation LEO constellation.

67 Telesat proposes to invest all net proceeds from this process into new facilities and satellites, including Telesat LEO, which as a core part of Telesat's plan to continue to provide services to all of its customers, will deliver an affordable, fibre-like broadband service across Canada, supporting the deployment of the most advanced broadband services to all of Canada. Telesat LEO, a state-of-the-art, innovative constellation, offering low latency broadband service, which supports the Government of Canada's universal broadband target of affordable 50/10 Mbps per household will be an essential component of the Government's policy of affordably

connecting all Canadians by 2030. In fact, Telesat LEO will be in-service well in advance of 2030 to meaningfully expand the availability of affordable broadband service that meets or exceeds 50/10 Mbps per household target.

**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.**

68 No response.

**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.**

69 No response.

#### **C. BLOCK SIZES IN THE 3650-4000 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**

70 Telesat notes that unpaired blocks of 10 MHz would align to the band plan adopted for the 3500 MHz band. All else being equal, consistency across both the 3500 MHz and 3800 MHz bands is likely to be advantageous.

#### **D. TREATMENT OF EXISTING USERS**

**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)

71 Telesat does not have a view on whether WBS licensees should be displaced or, if so, what alternative spectrum would be best suited as a substitute for the current WBS spectrum or

on the appropriate transition mechanisms. However, to the extent that ISED intends to enable continuity of existing services, it would be counter-productive to make it harder than necessary for incumbent service providers to secure rights to use the alternative spectrum allocated for the displacement.

**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.**

72 Telesat is not a WISP and has no specific insight into the costs that may be incurred by WISPs as a result of the proposed displacement. Telesat notes generally that the cost to replace or upgrade equipment in remote locations can be substantial.

**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.**

73 Telesat would not be involved in this proposed displacement and defers to those who would have direct knowledge. However, unlike the 3800 MHz band, there is no principal licensee who could be called upon to take responsibility for coordinating a transition of the WBS band. The WBS band is utilized by over 300 licensees, each with its own unique territory and network. It therefore seems unrealistic to expect a successful WBS transition on such an aggressive timeline.

**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.**

74 No response.

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

75 No response.

**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

76 As the Department recognizes in the Consultation, transitioning WBS licensees into the 3900-3980 MHz band raises interference concerns for fixed satellite services in satellite-dependent areas. Telesat therefore recommends that any future licensing process expressly provide for interference mitigation, and do so in a manner that is consistent with interference mitigation requirements in the 3700-3900 MHz band.

77 In particular, as Telesat notes elsewhere in this submission, protection of existing FSS services, including in satellite-dependent areas, will require protection of two designated gateway sites. This must include protection from interference from shared use in the 3900-3980 MHz band, if such use is allowed.

78 Furthermore, technical rules in the 3900-3980 MHz band must protect against any out-of-band emissions falling into the 4000-4200 MHz band, together with the proposed 20 MHz guard band, to protect on-going FSS use above 4000 MHz. As noted in response to Q7, Telesat is confident that this will be achievable.

**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.**

79 Telesat does not use this spectrum for FSS. In principle, Telesat has no objection to permitting existing FSS earth stations to continue to operate on a no-protection basis.

**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).**

80 Telesat believes that ISED's proposal to define satellite-dependent areas in which FSS would continue to be protected based on the Tier 4 service areas identified in annex E of the Consultation Document would be workable. However, it is important to recognize that protection of the 3700-4200 MHz band in satellite-dependent areas is not enough to avoid the need for substantial investment in the transition. It will still be necessary to reorganize traffic, particularly to ensure that return links that currently are received in teleports or directly at end-user locations in urban areas are relocated into the 4000-4200 MHz band (or are moved to a protected gateway site). This will require changes to ground equipment, which, in turn, will require site visits in a multitude of remote and difficult to reach locations. Thus, the ISED Proposal would not substantially reduce the costs and risks of clearing the 3800 MHz band for flexible use relative to the Telesat Proposal.

81 Importantly, the Telesat Proposal would go further than the ISED Proposal, clearing 400 MHz of spectrum rather than 300 MHz, with the transition in satellite-dependent communities being managed over time. Telesat continues to believe that its more ambitious clearing plan is achievable under the assumptions and conditions set out in that plan and delivers greater benefits to Canadians overall than supporting the status quo in satellite dependent areas where there is a tremendous demand for enhanced broadband services.

**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.**

82 Remote industry operations such as offshore drilling rely on the high availability and reliability of C-band satellite services for their communications. Safety of life of the crew working on remote drilling platforms located in harsh environments will depend on continuity of service. These users would reasonably expect assurance that these critical services would be protected from disruption due to interference from flexible use operations.

83 For the reasons noted above in the response to Q21 and elsewhere in this submission, the ISED Proposal, as described in the Consultation Document, will not be sufficient to protect existing services, even in the satellite-dependent areas. The Telesat Proposal represents the only



realistic, actionable path to ensure existing services to such remote operations can be sustained while also clearing a substantial portion of the 3800 MHz band for terrestrial flexible use. However, if ISED chooses to proceed with a modified proposal to protect FSS use of the full 3700-4200 MHz band in satellite-dependent areas, Telesat would support the inclusion of remote industry operations such as offshore drilling in the definition of 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 non 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.**

84 Setting aside questions about the scope and timing of the proposed clearing which are addressed in other portions of this submission, Telesat concurs with the proposal to make FSS use of the cleared spectrum secondary to flexible use. Since FSS presents no practical risk of harmful interference to terrestrial flexible use, there is no downside to permitting continued FSS operations on a no-interference, no-protection basis. This will allow the most flexibility in the event that there are delays or geographic variations in the roll-out of terrestrial services.

85 Telesat does not see any reason to alter the existing policy that FSS licence holders have a high expectation of renewal of licences for the portion of the band allocated to flexible use on a primary basis, provided a licensee is in compliance with the conditions of licence, including non-interference conditions. Since secondary use by FSS would continue to be permitted in these frequencies, a high expectation of renewal for use on a non-interference basis remains appropriate.

86 However, given that FSS operators would have no protection in the cleared spectrum, Telesat anticipates that licence fees would be proportionately reduced to reflect the reduced scope (and therefore economic value) of the licence.

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

87 Telesat is highly alarmed that ISED's proposal attempts to separate the date the U.S. established for the accelerated completion of the transition for the 3700-4200 MHz band from

the **substantial mechanisms adopted by the FCC** as the only way to realistically enable that outcome. Fundamentally, Telesat believes that achieving the proposed transition deadline without widespread loss of critical services will only be possible with substantial investment, which is best achieved under the Telesat Proposal. **The FCC has provided access to approximately C\$18 Billion in capital funding to facilitate this accelerated timeline.**

88 Specifically, in the U.S., the satellite operators (almost entirely SES and Intelsat) will be entitled to:

- a) approximately C\$13 Billion (US\$9.7 Billion) in Accelerated Relocation Payments if they meet the December 2023 target for accelerated clearing;<sup>12</sup> and
- b) an estimated C\$5 Billion (US\$3.6 Billion) in clearing costs, which include the full reimbursement for 13 new satellites required to continue services regardless of whether the December 2023 target date is met or not.<sup>13</sup>

89 The FCC rightfully understood that the only realistic path to avoiding loss of mission critical services was to work directly with the satellite operators (whose multi-billion dollar satellite investments were effectively being stranded to promote 5G). The FCC recognized that it would be unrealistic and untenable for the satellite operators to clear this spectrum without a financial structure that made it commercially viable. The FCC recognized that satellite carriers may need well over five years to coordinate this complex spectrum clearing process, with a final deadline of December 2025 (not 2023), even with full compensation for incurred costs.

90 Accordingly, the U.S. transition process approved by the FCC includes a mechanism that provides a commercial rationale for the satellite operators to undertake the very high cost and immense effort of the accelerated transition process, as does the Telesat Proposal.

91 The ISED Proposal does not.

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<sup>12</sup> The payments were divided as follows: Intelsat (US\$4.9 Billion, SES US\$4 Billion, Eutelsat US\$507 Million, Telesat US\$344 Million, and Star One US\$15 Million.

<sup>13</sup> Intelsat will receive reimbursement for 7 new satellites; and SES will receive reimbursement for 6 new satellites.

92 Currently, Telesat uses all 500 MHz of the 3700-4200 MHz band to deliver critical communications services across all of Canada, from relay broadcasting of live sporting events, to monitoring rural hydro-electric facilities in southern and northern Canada, to Canada-wide services provided to the Department of National Defence, to lifeline services provided to satellite-dependent communities. Importantly, these are two-way services – often connecting rural and urban installations, or northern and southern Canadians. Safeguarding satellite spectrum in satellite-dependent communities only goes part way in protecting these services – protecting the remote end of these services – and only for a fraction of Telesat’s services.

93 By the time a decision is issued in this proceeding, almost a year is likely to have elapsed since the FCC issued its order initiating the U.S. transition process, compressing the available time. Setting a mandatory deadline of December 2023 for the transition would be to ask Telesat to do in less than two years what the U.S. operators would have had up to five years to complete. Furthermore, any assumption that the U.S. clearing process would facilitate a more streamlined Canadian process is objectively false, as it will have virtually no impact on clearing 3800 MHz spectrum in Canada<sup>14</sup>.

94 It is manifestly unreasonable, and deeply prejudicial to Telesat for the Department to assume that Telesat would undertake the same costly and complex clearing process for which their foreign competitors will receive billions of dollars of funding, in a vastly shorter period of time, but without any mechanism to make it commercially viable for Telesat to do so.

95 Moving forward with such a proposal would significantly prejudice Telesat’s ability to compete in one of the most competitive and dynamic industries in the world.

96 For the avoidance of doubt, Telesat cannot and will not assume the responsibility to provide continuity of service for existing users of the 3800 MHz band except as outlined in the Telesat Proposal.

97 To be clear, however, this is not to say that preserving the vital services of current users is impossible. On the contrary, the Telesat Proposal sets out a mechanism by which it can

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<sup>14</sup> See footnote 8 and response to Q25 for additional details and references.

successfully transition these users and do so on an accelerated timeline. This offers a clear path to realizing the public benefit of accelerated deployment of terrestrial 5G service, while preserving the critical FSS services that Canadians rely on today and will continue to need in the future.

98 While clearing this spectrum and ensuring continuity of service is achievable, it is important to underscore that it is a highly costly and technically challenging process.

99 Today, Telesat operates three satellites with C-band payloads with full coverage of Canada, the U.S. and parts of the Caribbean. The C-band payloads on these satellites are fixed and cannot be modified in any way. Our Anik F1R at 107.3 WL, Anik F2 at 111.1 WL and Anik F3 at 118.7 WL have extremely high utilization.<sup>15</sup> The C-band capacity is used to support broadcasting distribution and contribution for television and radio services, backhaul trunking to remote and satellite reliant communities, services to the Department of National Defence and other Federal and Territorial government departments, and a number of enterprise-grade communications services supporting the resources and mining sectors, utilities and aeronautical safety.

100 ISED's 3800 MHz plan proposes clearing 300 MHz between 3700-4000 MHz and retaining 200 MHz between 4000-4200 MHz in non-satellite reliant areas; as well it proposes that a number of Tier 4 areas as defined in the consultation be identified as satellite dependent areas whereby FSS would be permitted to continue operation on a primary basis across all 500 MHz. Any transition plan, in particular one that allows for exemption areas, requires information on the exact number and location of all earth stations, licensed and exempt. This is information that Telesat does not readily have in order to develop a detailed transition plan based on ISED's proposal.

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<sup>15</sup> It is important to note that the three Telesat spacecraft have remaining fuel lives that would extend beyond 2025. Current estimates of when each satellite will be at the end-of-orbital maneuvers life for Anik F2 2026, Anik F3 2026 and Anik F1R in inclined operation 2026. Telesat notes this to clarify the following language found in par. 44 of the Consultation Document: "The expected end-of-life of each of Telesat's satellites varies with: Anik F2 ending in 2023, Anik F3 ending in 2024, and Anik G1 ending in 2032, however, the end dates may be extended".

101 Because of this lack of information, Telesat has not been able to develop a detailed implementation plan. That said, Telesat has analyzed its existing services and customers in depth and, therefore, can describe the considerations and process involved in clearing the spectrum. Fundamentally, transitioning existing users to clear meaningful portions of the 3800 MHz band will be a complex, lengthy and costly initiative requiring a number of iterations to adjust for limitations of earth station remote equipment, customer hub equipment and Telesat teleport facilities. Due to the current high utilization of the satellite resources, the steps to clearing must be done sequentially. Very little of the clearing work can be done in parallel because of the complex interdependencies in the sequencing of steps.

102 All the earth stations looking at the Anik satellites need to be identified and their locations confirmed (both to determine if they are in or not in satellite-dependent regions as defined in the Tier 4 Protected Regions list as well as so site visits can be planned), satellite visibility across the arc determined, and any other factors which may impact a required repointing or other change to the earth station, should the traffic plan require it. This process has started but, due to both the scope and complexities as well as the lack of information on earth stations to be included, it will take some time (after all information is available) to complete. In particular, television and radio receive-only earth stations numbers and locations are not readily available to Telesat; in fact, Telesat customers in certain instances must obtain this data from their respective customer(s).

103 Once sufficient earth station data is available, planning can start for repacking of signals that are (and will be) received in non-protected regions into the upper 200 MHz of the band. This would itself involve multiple steps, to consolidate and optimize the use of spectrum. Due to the high utilization on the satellites, the sequence of relocations must be planned carefully to avoid a “musical chairs” situation in which there is no available destination frequency to move a signal to.

104 Even if ISED chooses to preserve the full 500 MHz for FSS in satellite-dependent areas, the services link satellite-dependent areas to other regions of the country. Return carriers would need to relocate up in the band to be received at hubs, many of which are located in major urban centres.

105 Extensive site visits will be required, including in remote areas. For example, in cases where services need to move to other satellites, earth stations requiring repointing may not always have visibility to the new orbital positions. Site visits will be needed to survey the antennas and the surrounding area to ensure clear line of sight to the alternate satellite. This will determine whether the antenna can simply be repointed or whether it needs to be repositioned. Potential obstructions, such as trees, may need to be identified and removed. In other cases, the service may move to a different polarization on the same satellite. This would also require a site visit to ensure the antenna feed and inter-facility link or waveguide can be rotated to support the required move.

106 The plan will also include dual illumination for large multi-site networks, where antenna repointing, antenna repositioning, polarization rotation, and bandpass filter installation would be required to avoid disruption of service during the transition period. The length of the dual illumination period would depend on the size and complexity of the network requiring antenna modifications. Since vacant capacity is in short supply on the satellites, much of the dual illumination will need to be done in sequence rather than in parallel.

107 As detailed above, the process is complex. ISED's proposed clearing plan does not address who, how and when all of this work will be done to meet its 2023 deadline. Clearing of spectrum which is heavily used, requires sophisticated technical planning and program management, site surveys, additional or new hub and remote earth station equipment, numerous technicians and engineers to execute the work, cooperation of all satellite users and the financial capacity to pay for the moves. Absent a clear commercially viable approach, this complex clearing and reallocation of the 3800 MHz spectrum simply will not get done in Canada.

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

108 SES and Intelsat are the two satellites operators that are the most significantly impacted by the FCC decision to reallocate 300 MHz of the 3800 MHz band in the U.S. They hold, between them, the largest share of the U.S. FSS market and these two companies have a relatively small share of the business in Canada. Conversely, Telesat, has a small share of the U.S. FSS market but holds the largest share of the Canadian FSS market.

109 As outlined in the RABC submission, C-band spectrum is used for significantly different purposes and the C-band markets in the U.S. and Canada are largely independent of one another. In the U.S. C-band spectrum is used overwhelmingly for broadcast services, while in Canada, C-band spectrum is used for a multitude of services, largely focused on broadband trunking. As a result, Telesat does not see any impact on the continuity of FSS services in Canada due to the FCC process to reallocate 300 MHz of 3800 MHz spectrum for 5G use in the U.S.

110 Similarly, the U.S. clearing process does not facilitate a more streamlined Canadian process and will have virtually no impact on clearing 3800 MHz spectrum in Canada. The one impact the U.S. process will have on the Canadian process is that virtually all 3800 MHz orbital slots over Canada are utilized (*i.e.* there is nowhere to put additional 3800 MHz satellites)<sup>16</sup>. Considering the need for significant amounts of new satellite capacity to provide continuing services for the existing 3800 MHz users, coupled with the inability to add additional 3800 MHz capacity due to the lack of orbital slots over the Canadian arc, Telesat LEO will be a fundamental aspect of clearing this spectrum.

**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

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<sup>16</sup> See footnote 8 for additional details and references.

**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.**

111 Telesat refers the Department to the RABC response to Q24, which Telesat fully supports, as well as its own response above to Q24 above.

112 Telesat notes that the final FCC deadline for FSS transition is December 2025 and includes full reimbursement of costs incurred in the process. The accelerated date of December 2023 brings with it added difficulty and costs for the FSS industry, which the FCC addressed by providing massive financial incentives. Further, the process in the U.S. was decided in March 2020 and is now fully under way.

113 In contrast, ISED is still in the consultation phase and the details of the ISED decision and the date on which it will be communicated are unknown. The ISED consultation does not acknowledge the fact that the FCC has authorized reimbursement of costs and massive financial incentives in order to achieve the same clearing deadlines with an earlier start date. Nor does ISED include any commercially viable alternative mechanism to ensure that the transition occurs and service continuity is maintained. These conditions all create substantial barriers to a successful transition.

114 Although these barriers are not insurmountable, ISED must be cognizant and account for the criticality of the important services supported today in the 3800 MHz band as well as the tremendous complexity and expense that such a transition will require. The core aspects of the Telesat Proposal offer the only viable and actionable path to achieve an effective and timely transition of current users and clearing of the 3800 MHz spectrum.

**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)

115 Subject to its overriding concerns that the transition cannot be successful without a mechanism that makes it viable for Telesat, as the only Canadian licensed satellite operator, to manage the transition process and its comments on the transition date(s) and definition of satellite-dependent and non-satellite-dependent areas in response to Q21, Q22, Q24 and Q27 respectively, Telesat would support the proposals described in a), b) and d), including the proposed notification requirement for deployment of fixed or mobile stations.

116 As discussed in response to Q19, Q21 and Q30, Telesat would also support proposal c), subject to a carve-out for two designated gateway sites, which would need to continue to operate (and be protected from interference) over the entire 3700-4200 MHz band and that FSS earth stations be licensed to operate in 3700 – 4000 on a secondary basis in areas where flexible use is permitted in 3700 – 3980 MHz..

**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.**

117 Telesat is concerned that the draft footnote CZZ does not take into account the need to fully protect FSS services in satellite-dependent areas.<sup>17</sup> This requires protection from harmful interference of not only existing, but also new, earth stations operating across the 3700-4200 MHz band, provided that the earth stations are located within satellite-dependent areas. Telesat notes that within satellite dependent areas there is likely to be relatively little demand to establish flexible use networks. Further, co-primary status does not preclude establishment of such

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<sup>17</sup> See Consultation Document at paragraph 71.

networks; it simply requires that new flexible use networks or new earth stations must coordinate with prior-licensed networks in the other service.

118 Two designated gateway sites approved by the Department must also be protected, since it is only through the gateways that satellite-dependent areas may be connected to Canada's backbone telecommunications networks. These gateways will need to be carefully selected, as further addressed in Telesat's response to Q30.

119 Telesat proposes the following wording for footnote CZZ:

*As of [Transition deadline] FSS earth station operations in the band 3700-4000 MHz will operate on a no-protection basis, except for those earth stations in satellite-dependent areas and at approved gateway locations, as per [future decision paper], which will operate on a co-primary basis with the Fixed and Mobile flexible use services.*

**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

120 As noted in Telesat's response to Q19, Q21 and Q29, in order to maintain service in satellite-dependent areas, at least two gateways must also access the entire 3700-4200 MHz spectrum to avoid constraining the ability of satellite dependent areas to connect with Canada's telecommunications backbone.

121 Gateway locations need to be located carefully. To minimize the geography over which terrestrial flexible use may be constrained, gateway sites should be located in natural valleys in order to maximize terrain shielding. Gateways should also not be located in urban and suburban areas, where demand for flexible use services is likely to be the highest. On the other hand, in view of their importance, the gateways need to be located so that redundant connections to terrestrial broadband networks may be made and so that the gateways may be easily accessed by skilled maintenance staff.

122 Telesat proposes that the primary gateway location for Telesat services be Allan Park, Ontario. Allan Park meets the criteria listed in the above paragraph and has served as a major earth station and TT&C location since Telesat began operations in 1972. Telesat is also willing to make commercial arrangements with other satellite operators who wish to land their traffic in Allan Park. A second gateway site is required for increased flexibility and network resiliency.

**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.**

123 Telesat agrees that it will be important to collect information about existing and new licence-exempt earth stations in the 3700-4200 MHz band, to facilitate any transition and to allow future coordination. In principle, Telesat is not opposed to an interim authorization process as a means to accomplish this. However, Telesat has some concerns about some of the details of ISED's proposal on this point.

124 In particular, it is not entirely clear what would motivate an existing licence-exempt earth station operator to apply for such an interim licence. Under ISED's proposal, they would obtain some temporary protection from adjacent band interference from WBS in the 3650-3700 MHz, but these earth stations are currently operating (presumably satisfactorily) without such protection. In other respects, ISED appears to only be offering protection from interference from flexible use sources that should not be present under the ISED Proposal, in any event (*i.e.* in satellite-dependent areas or in other areas prior to the transition dates).

125 Furthermore, while ISED has indicated that no fees would apply initially, it has left open the possibility that fees might be assessed in the future. This would pose a disincentive for potential applicants, particularly if they do not see any compelling benefit from the licence.

126 The Telesat Proposal contemplated relying on the existing registration model, rather than voluntary licensing. Under the Telesat Proposal, unregistered and unlicensed earth stations would not be part of Telesat's transition plans for the simple reason that if an earth station was unregistered or unlicensed, Telesat would have no practical way to know where it is and how to incorporate it into the transition plan. This model provides a clear incentive to unlicensed earth station operators to register their earth stations, without adding any unnecessary licensing overhead.

127 Telesat suggests that an extended deadline for registration of licence-exempt earth stations may be a simpler and more attractive alternative to ISED's proposed interim licensing model.

**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.**

128 Under the Telesat Proposal, a registration deadline for unlicensed earth stations in the 3700-4200 MHz would be appropriate to provide certainty for the scope of the transition process that Telesat would be responsible for. At some point, the list of earth stations eligible to be included in the transition must become fixed, for planning and logistics purposes.

129 It is not clear whether ISED's proposed 90-day deadline serves the same purpose under the ISED Proposal since ISED's proposal does not explain how the interim authorization would affect responsibility for transition arrangements.

**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.**

130 Telesat agrees that licence-exempt receive-only earth stations should continue to be entitled to operate on a no-protection basis if they are not eligible for, or choose not to apply for, an interim authorization (should ISED choose to offer such an option).

**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.**

131 Telesat supports this proposal, since it would treat interim licensees on par with other existing FSS earth station licensees. Telesat sees no obvious reason to do otherwise. The same rationale would apply to Q35 and Q36.

**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.**

132 See Telesat's responses to Q28 and Q34. If ISED chooses to grant such interim authorizations for receive-only earth stations, Telesat supports treating such licensees on par with other existing FSS earth station licensees.

**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.**

133 See Telesat's response to Q6, Q28 and Q33. If ISED chooses to grant such interim authorizations for receive-only earth stations, Telesat supports treating such licensees on par with other existing FSS earth station licensees.

**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.**

134 In general, Telesat believes that it should continue to be possible to license new FSS earth stations in the band(s) in which FSS operations will continue after the transition. As noted in its response to Q34, Telesat also believes that interim authorizations for receive-only earth stations should generally be treated on par with other FSS earth station licences. It follows that Telesat would support making the interim authorization process available to new receive-only FSS earth stations, if ISED chooses to offer them to existing license-exempt users.

**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.**

135 As noted above in response to Q31, Telesat questions whether fees should apply to an interim authorization, particularly where there is little obvious benefit to the putative licensee compared to continuing to operate on a licence-exempt basis.

136 Telesat believes that new earth stations in satellite-dependent areas should not be limited to operation only in the 4000-4200 MHz band if FSS operations would be permitted in such areas over the entire 3700-4200 MHz band.

137 Conversely, Telesat does not understand why adjacent band protection should be granted to new earth stations operating in 4000-4200 MHz but not to existing earth stations operating in the same band. In this respect, draft condition G5 does not appear to be consistent with paragraph 146 of the Consultation Document. This should be clarified.

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

138 Telesat is unclear on ISED's rationale for treating stations that are part of existing enterprise networks differently from those used by individuals to directly receive satellite broadcast signals intended for the general public. While enterprise operators may be better-placed to understand and assess the trade-offs of ISED's proposal, individuals receiving direct broadcast signals will also be affected by the transition. Telesat does not understand how ISED's proposal addresses the needs of these users.

**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.**

139 Telesat agrees that there is no obvious need to issue new fixed service licences for fixed point-to-point applications in the 3700-4000 MHz band. Such applications could be authorized under flexible use licences, if there is demand for such deployments.

**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.**

140 Given: a) the limited current demand for fixed point-to-point applications in the 3700-4200 MHz band; and b) the challenges FSS operators will incur in trying to sustain existing services with substantially less available bandwidth, it would be appropriate to reserve the 4000-4200 MHz band for FSS use in the future. There is likely no compelling need to issue new fixed service licences in the 4000-4200 MHz band at all.

141 At a minimum, Telesat would ask that any new fixed service licensees should be required to coordinate with existing FSS licensees.

**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.**

142 No response.

#### **E. TECHNICAL CONSIDERATIONS**

**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.**

143 No response.

**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.**

144 No response.

**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?

145 Telesat takes no specific position on what technical measures should be adopted, if any, but generally endorses the principle that incumbent WBS licensees should be protected from interference from new flexible use stations until any applicable displacement deadline, subject to voluntary agreements that may be reached between the relevant parties. This is consistent with the Department's prior practice in similar displacements.

## Adjacent band

**Q46: Until the transition deadline, in all areas for flexible use in the 3650-3700 MHz band: ISED is seeking comments on the proposal that until the transition deadline, those flexible use licensees deploying stations in 3650-3700 MHz within 25 km of a licensed FSS earth station (not including interim FSS authorization) in the 3700-4200 MHz band will be required to coordinate with the operators in these earth stations.**

146 The coordination requirements to protect FSS operations in the 3700-4200 MHz until the transition deadline from flexible use in the 3650-3700 MHz band should be consistent with the technical requirements to protect FSS operations in the 4000-4200 MHz band from Flexible use operations in the 3700-4000 MHz band after the transition. The PFD limits imposed on flexible use base stations and OOB limits into FSS earth stations are required. Until bandpass filters can be deployed on all earth stations, a coordination distance will assist in the protection of FSS services during the transition. Telesat does not endorse the 25 km at this stage, but rather recommends that the appropriate coordination distance be studied as part of the development of an SRSP. Refer to Q49 of the RABC and Telesat responses.

**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.**

147 Telesat participated in the development of, and fully supports, the response of the RABC to this question.

148 Telesat stresses the importance of maintaining the current SRSP-520 coexistence requirements for flexible use operations in the 3450-3650 MHz band when and where satellite operations will continue and continue to be protected throughout the 3700-4200 MHz band, *i.e.*:

- in satellite-dependent areas, if applicable;
- within a coordinated distance from any gateway[s]; and
- during the transition period.

**Q48: For FSS earth stations licensed in the 4000-4200 MHz band and flexible use in the 3800 MHz band, in all areas: ISED is seeking comments on adjacent band coexistence measures, taking into account the coexistence measures adopted by the EU (*i.e.* a stringent OOB limit) and the U.S. (*i.e.* a combination of guard band, a typical OOB limit, pfd**



**limits, and baseline minimum filter specifications for earth station operations) and the current Canadian requirements (i.e. a typical OOB limit and coordination distance):**

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

149 Telesat endorses the response of the RABC to this question.

**Q49: ISED is seeking comments on what technical requirements should be imposed to ensure cochannel 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<sup>2</sup>/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?

150 Telesat endorses the response of the RABC to this question, and in particular the recommendation for further study of appropriate coordination triggers as part of the SRSP development.

### **Earth station technical parameters**

**Q50: ISED is seeking comments on whether the assumptions made by the FCC about earth stations, including baseline minimum filter specifications for earth station operations as stated above, are applicable to Canadian operations. Is there any additional information that ISED should consider in the development of appropriate technical rules to enable coexistence both cochannel and in adjacent bands?**

In providing comments to Q46-Q49, respondents are requested to consider the coordination burdens such coexistence and protection measures could impose on either flexible use services or FSS earth stations.

151 Telesat endorses the response of the RABC to this question.

152 Telesat stresses that the measures adopted in the U.S. to control interference are well-understood and equitable between the FSS and flexible use. Telesat has been in discussion with filter vendors and has determined that filters that meet the U.S. specification are available from multiple vendors.

**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?**

153 Telesat generally supports the comments of the RABC in response to this question. Specifically, Telesat supports the Department's proposal to implement a frequency separation between the bands for flexible use and those allocated on a primary basis to aeronautical radio-navigation and aeronautical mobile (route) service in 4200-4400 MHz. This is the approach the FCC is taking to protect radio altimeters onboard airplanes and helicopters, as well as the operation of Wireless Avionics Intra-Communications (WAIC) systems onboard aircraft.

154 Further work is required to fully assess the potential for interference, if any, to radio-navigation operations in the 4200-4400 MHz band, and appropriate mitigation techniques, if required. While the U.S. analysis is focused on flexible use up to 3980 MHz, it may be possible to extend the results to support flexible use services to operate up to 4080 MHz. Telesat urges the Department to closely monitor developments concerning flexible use/radionavigation compatibility in the U.S., and to engage with both the flexible use and aviation communities in Canada to determine what, if any, additional technical measures or implementation schedule changes might be necessary to operate up to 4080 MHz which would reduce the separation to 120 MHz.

#### **F. LICENSING PROCESS FOR THE NEW FLEXIBLE USE LICENCES**

**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.**

155 For the reasons articulated elsewhere in this submission, and in the Telesat Proposal, Telesat strongly believes that the clearing of 3800 MHz spectrum in Canada can only be achieved with substantial investment.

156 To be clear, Telesat is not in a position to fund this investment.

157 The Telesat Proposal sets out a mechanism by which industry can fund the needed investments without any need to draw on the public purse, through secondary market transactions that will be conducted through an open and fair process contemporaneously with the 3500 MHz auction so that wireless carriers can effectively plan their mid-band deployments. Telesat continues to believe this is the best path to achieve a successful outcome.

158 Moreover, the Telesat Proposal is the only practical way forward for the Department to auction any part of the 3700-4200 MHz spectrum band and realize any potential future auction proceeds to the Treasury without jeopardizing the vital services Canadians receive over this spectrum today.

#### **G. PROPOSED ACCELERATED SPECTRUM CLEARING APPROACH**

**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.**

159 As articulated in the Telesat Proposal, Telesat strongly believes its proposal is in the best interest of Canadians and fully embodies and furthers the Government of Canada's policy objectives and priorities as laid out in the Innovation and Skills Plan as well as the Spectrum Policy Framework for Canada. Specifically, Telesat believes the Telesat Proposal will:

- a) meaningfully contribute to Canada's objective of wireless affordability, including the reduction of wireless prices by 25% through lower 5G spectrum and infrastructure costs and enhanced sustainable wireless carrier competition;

- b) build on Canada's global LTE leadership position by expediting innovation, investments and the adoption of world-leading 5G technologies;
- c) accelerate and facilitate the deployment and availability of universal connectivity across the country, notably in rural, remote, Northern and Indigenous communities;
- d) protect and maintain continuity of the mission critical services being delivered over the 3800 MHz band to existing users of fixed satellite services (FSS) nationally; and
- e) position Canada at the forefront of the strategic, high-growth telecommunications and new space sectors, creating thousands of new sustainable, high-quality STEM jobs across Canada, developing valuable Intellectual Property, and accelerating the development of next generation technologies such as Artificial Intelligence, machine learning and advanced manufacturing, positioning Canadian industry and Canadians for long-term global success.

160 The Telesat Proposal and the ISED Proposal are largely aligned on the objective of making more mid-band spectrum available for 5G services. The fundamental difference between the two proposals in addition to the accelerated timeline is that the Telesat Proposal directly addresses the means by which existing services can be protected in the transition, by providing for mechanisms that both make it commercially viable for Telesat to underwrite the costs and provide accountability for planning, coordination, and implementation of the complex sequence of steps required, as described in more detail in Telesat's response to Q24.

161 To be clear, without a commercial rationale for the necessary investments, the ISED Proposal will result in the loss of critical services that Canadians rely on today, including in the satellite-dependent areas that the ISED Proposal acknowledges and seeks to protect. The services provided in satellite-dependent areas currently depend on transmission links in other parts of the country to connect to backbone networks. Under the ISED Proposal, Telesat would be required to clear the spectrum used for those links, cutting off the services the satellite-dependent areas rely on, without any means to fund the significant investment required to replace or modify them. Similar dynamics would disrupt other critical services currently provided throughout the country.

**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**

162 Telesat believes its proposal brings tremendous benefits to Canadians and strongly supports the public policy objectives ISED has articulated.

163 As the Government of Canada has rightly stated numerous times, access to affordable high-speed broadband and wireless services is no longer a luxury but a necessity. The Telesat Proposal accelerates the timelines for rural/remote connectivity in two important ways. First, the Telesat Proposal recognizes that in many communities (even communities containing a large population centre) incremental mid-band spectrum is necessary for last mile delivery of high speed broadband connectivity to homes, businesses and schools. The Telesat Proposal substantially advances the timeline for availability of 200 MHz of 3800 MHz spectrum, bringing it to market on the same timeline as the 3500 MHz spectrum band, accelerating not only 5G wireless services, but also next generation fixed wireless broadband in communities all across the country. Second, Telesat will be investing all of its net proceeds from 3800 MHz spectrum into new facilities and satellites, including Telesat LEO, which will deliver an affordable, fibre-like broadband service ubiquitously across Canada, conclusively resolving the Digital Divide for all Canadians from Coast-to-Coast-to-Coast.

164 Furthermore, Telesat's proposal would advance competition in mobile services, which can only be delivered if sufficient carriers have access to an adequate pool of wireless spectrum to launch competitive wireless offerings.

165 Wireless carriers cannot deploy competitive 5G services without access to mid-band 5G spectrum, which combines the beneficial penetration and propagation (coverage) characteristics of low-band spectrum with the speed and capacity benefits of high-band spectrum. However, the Department's mid-band 3500 MHz auction – scheduled for June 2021 – will release just ~110 MHz of mid-band spectrum (on a population-weighted basis), of which only ~65 MHz will be made available to national wireless carriers. In contrast, the benefits of 5G can only be achieved with wide blocks of spectrum, ideally 100 MHz blocks. Wireless carriers require immediate access to more mid-band 5G spectrum. The Telesat Proposal would make an incremental 400 MHz of spectrum available for 5G services, 200 MHz of which would be cleared on a

significantly accelerated timeline relative to the Department's spectrum clearing proposal; and all of which would be cleared by Telesat at no cost to users and in such a manner as to avoid any risk of loss of service. Importantly, the Telesat Proposal would not only accelerate the availability of this critical 5G spectrum, it would coordinate spectrum assignment with the 3500 MHz auction, giving carriers the visibility into 5G spectrum assignment they require to conclude their 5G network deployment plans.

**Q55: ISED is seeking comments on what elements from sections 7 to 10 of this consultation would still apply or need to change if ISED were to implement the Telesat proposal, in particular:**

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

166 Telesat supports the ISED proposal to maintain a primary allocation to FSS in the entire 3700-4200 MHz band.

167 It is essential that the entire 500 MHz of spectrum be available, at least at two gateway locations to enable TT&C operations to ensure continued reception of signals received from satellites that may still be operating across the full 500 MHz of spectrum. This will ensure that satellite operators and customers alike have access to the commensurate spectrum to support their two-way communications needs, *i.e.*, the forward links to the North but equally the required spectrum for the satellite return links to the South. In addition, as noted in the Telesat Proposal, and consistent with previous spectrum reallocations, the Department has adopted a "where and when necessary" principle. Generally incumbent licences who do not transition to alternative spectrum are permitted to continue operating where such operations do not prevent deployment by new licensees. This may apply to certain remote locations across Canada where 5G is not anticipated to deploy in the near-term.

168 Telesat understands and agrees entirely with the basic imperative to preserve the vital services that satellite-dependent areas rely upon. Ensuring continuity of services is a basic premise of the Telesat Proposal. On that basis, Telesat would not oppose defining satellite-dependent areas or applying different protections within those areas. (As noted in the answer to Q8, if ISED does not foresee the deployment of terrestrial flexible use services across the 3800 MHz band in some or all of the satellite-dependent areas of the country, there would be no downside to allowing FSS to continue in the entire 3700-4200 MHz band in those areas.) However, as noted in response to Q10, Telesat does not believe that satellite-dependent areas should be restricted to an unsatisfactory status quo. The Department's goal is (as it should be) to ensure that all Canadians have access to and benefit from the latest wireless telecommunications services. The Telesat Proposal aims to achieve this in three ways:

1. first, by ensuring that residents in satellite-dependent areas are not asked to sacrifice the services they rely on today;
2. second, by preparing for and enabling the eventual roll-out of enhanced terrestrial wireless services, including 5G services, in those areas, in coexistence with vital, existing FSS services; and
3. third, through Telesat's commitment to invest all of the net proceeds from this process into new facilities and satellites, including Telesat LEO, which will deliver an affordable, fibre-like broadband service across Canada, supporting the deployment of broadband, LTE and 5G to all of Canada and fulfilling the Government of Canada's universal broadband targets available to all Canadians, including in satellite-dependent areas.

169 Telesat also recognizes that migrating WBS licensees above 3900 MHz creates the potential for 450 MHz of contiguous spectrum dedicated to 5G, and wishes to highlight to the Department that there is nothing inconsistent between the Department's proposal in respect of the WBS spectrum and the Telesat Proposal. Assuming Telesat receives a license for 200 MHz flexible use license on conversion of its 400 MHz of C-band spectrum to 5G spectrum, the Department could allocate the 3900 MHz to 4100 MHz spectrum to maximize the spectrum's use for all Canadians, including allocating a portion of this spectrum to transferred WBS licensees.

170 Telesat does, however, note that – unlike the 3800 MHz spectrum, of which Telesat is the only Canadian satellite licensee and thus uniquely positioned to efficiently manage the costly and complex clearing process for this spectrum – the WBS band is utilized by over 300 licensees, each with its own unique territory and network. In all practicality, it is unlikely that migration of the WBS licensees could be accelerated beyond the Department’s already aggressive timelines for transitioning WBS licenses out of the band. Therefore, while transitioning of the WBS spectrum to 5G can certainly be accommodated within the Telesat Proposal, it likely cannot be accommodated on the same accelerated timeline as Telesat proposes for the clearing of 3700-3900 MHz. Thus any process for the licensing of the WBS band to wireless carriers should remain independent of the process for the disposition of the 3700-3900 MHz band to wireless carriers in order to avoid unnecessary delay to the availability of mid-band spectrum for terrestrial wireless services.

171 Similarly, the Department’s proposal to grant interim authorizations for certain existing licence-exempt earth stations in the 3700-4200 MHz band is also entirely compatible with the Telesat Proposal. However, as noted in response to Q31-Q37, Telesat is not entirely certain that such an interim authorization model is either necessary or entirely helpful. A registration model may be simpler and ultimately more successful if ISED’s primary goal is to address the need to identify the existing licence-exempt earth stations so that they can be included in the transition process.

172 Technical considerations for co-existence are discussed in the RABC responses to Q49 and Q50. The same considerations apply whether flexible use is permitted up to 3980 MHz, as the Department has suggested, or up to 4080 MHz, consistent with the Telesat Proposal.

173 In its discussions with vendors of earth station filters, Telesat has been assured that the filter designs that exist to comply with the FCC filter mask requirements can be adapted to adjust the lower limit of the pass band from 3980 MHz to 4080 MHz. Accordingly, Telesat is confident that filters will be available regardless of the ultimate disposition of the 4000-4100 MHz band.

174 Finally, given the concerns voiced by the aviation stakeholders with respect to a 220 MHz separation between flexible use and aviation systems Telesat recommends that further study is required to understand the potential for harmful interference if flexible use was to be



authorized to operate up to 4080 MHz. The recommendations for mitigation strategies that will result from the MSG TWG-3 in the U.S. (as described in the response to Q51, above) will inform the studies in Canada, although the reduced guard band will need to be taken into account.

**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

175 As set out in the Telesat Proposal, Telesat believes that conditions of licence for flexible use in the 3800 MHz band should align as much as possible to the 3500 MHz band. From a user perspective, the two bands are very similar and are likely to be used together and interchangeably.

176 Neither the Consultation Document nor the Telesat Proposal identify or suggest any band-specific issues or alternative conditions of licence, other than conditions required for protection of FSS services in satellite-dependent areas and at gateway sites, to the extent applicable. Further delay in determining the applicable conditions of licence would undermine the goal of enabling accelerated roll-out of 5G services. Whatever conditions of licence ISED intends to impose would need to be identified and included in ISED's Decision.

177 Telesat proposed a single Tier 1 flexible use licence largely for convenience, on the assumption that it would subsequently be subdivided through secondary market transactions approved by the Minister. Telesat is largely indifferent to the structure of the initial flexible use licence(s), so long as Telesat receives flexible use rights on a national basis (reflecting the national scope of its current spectrum rights that it would be giving up) that it can make available through the secondary market.

**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

178 Telesat has no additional comments on this issue at this time other than to reiterate the point that whatever conditions of licence ISED intends to impose would need to be identified and included in ISED's Decision.

**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.**

179 Telesat's proposal fully addresses the transition of FSS earth stations and all costs associated with the proposed spectrum reallocation. Telesat's priority is to ensure that C-band customers continue to receive the equivalent high-quality service with no interruptions during and after the 3800 MHz clearing process.

180 Should the proposal be approved by the Department, Telesat will provide a detailed transition plan which addresses the transition of FSS earth stations that are licensed and registered. Telesat will also work directly with each and every one of its customers (including the Government of Canada) to collaboratively assess options for moving up/down in the band or transition to other geostationary bands or Telesat LEO. In this process, Telesat will cover all transition costs (*i.e.* filters, repointing of antennas, or new equipment if necessary) to maintain the continuity of existing services with Telesat. In many cases, this will include migrating certain Telesat services onto the Telesat LEO constellation or other alternative satellites.

181 Telesat will work with the other Satellite Operators (SES and Intelsat) and will take full responsibility for managing and coordinating (and, to the extent necessary, implementing) any service and equipment changes necessary to protect service continuity for Eligible Earth Stations (as defined below) that would be affected by the proposed spectrum reallocation.

182 In order to facilitate the transitional arrangements for these unlicensed stations, and ensure no one is missed, the Satellite Operators must know where they are and how to contact their owners and/or operators. The Department's licence database will contain this information for licensed earth stations. However, as has been noted in previous proceedings, there is a large (and uncertain) number of receive-only earth stations that have been deployed on an unlicensed basis. ISED recently concluded a process to gather earth station information from unregistered or unlicensed operators as outlined in the Spectrum Advisory Bulletin, SAB-001-19 — Request for Information on Fixed Satellite Service (FSS) Earth Stations Operating in the 3700-4200 MHz Band (RFI). The information requested in the RFI includes contact information for the respondent, information about the satellite used, the location of the earth station, information about its typical usage, and certain technical parameters about the earth station.

183 Under the Telesat Proposal, this transition process would apply to all licensed earth stations authorized to use the 3700-3900 MHz and 3900-4100 MHz bands in Canada, including those authorized to use foreign satellites in accordance with CPC-2-6-01, as well as all unlicensed earth stations using this spectrum in Canada that were identified through responses to the RFI (each, an "Eligible Earth Station"), provided in each case that the relevant Satellite Operator receives sufficient contact information and operator cooperation prior to a cut-off date to be determined.

184 ISED has proposed an interim licensing mechanism. As discussed in Telesat's answer to Q31, an extended deadline for registration of licence-exempt earth stations may be a simpler and more attractive alternative to ISED's proposed interim licensing model. If ISED adopts either its proposed interim licensing mechanism or Telesat's suggested approach, it would be appropriate to limit the transition support to licensed earth stations.

185 In either case, Telesat is not proposing to limit this transition support to its own customers. Telesat will coordinate with the other Satellite Operators to provide the same transitional support to their Canadian customers and end-users or, if necessary, procure or provide comparable alternative services and facilities for the Eligible Earth Station operators.

186 Telesat's proposal is the only path to protect our customers' services (and other FSS customers' services in Canada), and do so without the customers incurring costs.

**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

187 Telesat proposed to include the additional flexible use spectrum because it believes, based on discussions with industry, that it would be possible for terrestrial operators to deploy and use it. In particular, based on information received from vendors, Telesat understands that 5G equipment and FSS filters would be available. Please see the RABC response to this question and Telesat's response to Q55 for additional details.

188 It is true that reducing the residual FSS primary allocation from 200 MHz to 100 MHz will make the transition marginally more challenging. However, Telesat is confident that the entire 3700-4100 MHz band can be successfully cleared with no loss of service to existing FSS users, provided that the process is carefully managed and financial incentives exist so that that sufficient investment may be made in new facilities, notably Telesat LEO. The key is to ensure adequate funding to enable the process.

189 The 100 MHz difference in cleared spectrum along the Canada and U.S. border should have no material impact on U.S. FSS earth stations operating close to the border. The FCC's International Bureau Application Filing and Reporting System database indicates that there is a relatively small number of licensed C-band earth stations in close proximity to the U.S. border that could be impacted by the flexible use signals. Moreover, because the U.S. FSS earth station antennas are pointed at satellites operating in the geostationary arc, and are generally south facing and oriented away from the Canadian border in the majority of cases, the discrimination between the base station transmitted signal and the boresight of the earth station antenna is high, further reducing the likelihood of interference.

190 Telesat is indifferent to whether the 4000-4080 MHz band is allocated for flexible use, or for some other purpose. There may be more suitable uses for that spectrum; that is ultimately a decision for the Department to make. The Telesat Proposal assumes that a future consultation may be necessary on that point.

191 What the Department must understand, for the purposes of this consultation, is that the clearing exercise is fundamentally the same, whether 300 MHz is to be cleared or 400 MHz. The cost and complexity will be substantial in either case, and neither could be successful without an appropriate commercially viable clearing mechanism.

### **III. CONCLUSION**

192 In view of the foregoing, Telesat respectfully submits that the Department should:

1. enable flexible use in the 3800 MHz band;
2. issue one or more flexible use licenses in the 3700-3900 MHz band to Telesat;  
and
3. adopt the core elements of the Telesat Proposal by which Telesat will:
  1. take responsibility for an accelerated clearing of the 3700-4100 MHz band;
  2. fund the substantial investment necessary to clear that spectrum without disruption to the critical FSS services that Canadians rely on every day, and without cost to end users, through secondary market transactions; and
  3. invest all of the net proceeds from this process into new facilities and satellites, including Telesat LEO, which will deliver an affordable, fibre-like broadband service across Canada, supporting the deployment of broadband, LTE and 5G to all of Canada and fulfilling the Government of

Canada's universal broadband commitment to all Canadians, including those in satellite-dependent areas.

All of which is respectfully submitted on behalf of TELESAT

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