



**Fast tracking affordable, Canada-wide 5G and universal
connectivity with 3800 MHz spectrum**

Proposal Submitted by Telesat Canada to
Innovation, Science and Economic Development Canada

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TABLE OF CONTENTS

	Page
I. EXECUTIVE SUMMARY	1
II. INTRODUCTION	12
A. Telesat's Experience.....	12
B. Background and Context.....	13
C. Recent Developments in the 3800 MHz Band.....	14
D. The Opportunity for Canada	16
III. FLEXIBLE USE IN THE 3800 MHZ BAND	16
IV. TRANSITION PLAN FOR INCUMBENTS IN THE 3800 MHZ BAND	17
A. Fixed Satellite Service (FSS).....	17
B. Release Process	20
C. Earth Stations	23
D. Gateway Protection.....	24
E. Other Licensees.....	25
V. SPECTRUM POLICY CONSIDERATIONS	26
A. Band Plan and Allocation	26
B. Cross-Border Issues	26
C. Conditions of Licence	27
D. Moratorium in the 3800 MHz band	28
VI. CONCLUSION.....	29

I. EXECUTIVE SUMMARY

1 Following Innovation, Science and Economic Development Canada's (ISED or the Department) recent preliminary repurposing consultation on the 3800 MHz spectrum band¹ – and the broad-based support expressed by Industry for clearing significant additional mid-band spectrum for 5G deployment – Telesat has developed the following proposal enabling an accelerated repurposing and licensing of the 3800 MHz band for the Department's and Industry's consideration while continuing to provide uninterrupted services to the existing users of this spectrum.

2 Telesat strongly believes the following proposal 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 this proposal will:

- I. 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;
- II. Build on Canada's global LTE leadership position by expediting innovation, investments and the adoption of world-leading 5G technologies;
- III. Accelerate and facilitate the deployment and availability of universal connectivity across the country, notably in rural, remote and Indigenous communities;

¹ SLPB-004-18, Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band

- IV. 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
- V. Position Canada at the forefront of the strategic, high-growth telecommunications and new space sectors, creating thousands of new STEM jobs across Canada, developing valuable Intellectual Property, and accelerating the development of next generation technologies such as Artificial Intelligence and advanced manufacturing, positioning Canadian industry and Canadians for long-term success.

3 5G represents one of the most promising technological and economic transformations in recent history and mid-band spectrum, notably the 3500 MHz and 3800 MHz bands, have emerged as a critical foundation for ubiquitous, affordable 5G given their unique characteristics and properties. Specifically, these bands are low enough in the radio frequency table to enable meaningful propagation (and hence coverage) but high enough in the radio frequency table to support the wide 100 MHz channels required to deliver affordable, optimum 5G. In Canada, this perspective is widely supported within the wireless 5G ecosystem, as demonstrated in ISED's extensive 2018 *Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band* and in ISED's *Spectrum Outlook 2018 to 2022*.

4 Globally, regulators are working to make mid-band spectrum in the 3500 MHz and 3800 MHz bands available for 5G use on an accelerated timeline. Notably, the United States Federal Communications Commission (FCC) recently adopted a plan to rapidly accelerate the clearance of 3800 MHz spectrum resulting in 280 MHz of spectrum (3700-3980 MHz) being repurposed from FSS to 5G with an auction slated for December of this year. In recognition of the

tremendous economic value to be gained by the United States through an acceleration of 5G deployment, the criticality of maintaining continuity of services to customers using this spectrum today, and the significant investments made in existing FSS infrastructure by satellite operators to date, the FCC has incentivized the five FSS satellite operators supplying services to the U.S., including Telesat, Intelsat and SES, with US\$9.7 Billion in incentive payments for clearing this spectrum. In addition, in recognition of the immense cost and complexity of transitioning existing satellite services into a smaller spectrum footprint, satellite operators will recover all costs associated with clearing this spectrum. The satellite operators, in filings with the FCC, estimated their reimbursable clearing costs at ~US\$3.6 Billion.

5 It is important to recognize that satellite operators in both the United States and Canada are currently using the full 500 MHz of 3800 MHz spectrum from multiple different orbital locations to deliver core broadcast and mission critical voice and data connectivity services. As noted below, in Canada, Telesat serves hundreds of thousands of Canadians over this spectrum, including as the single source of communications infrastructure throughout much of the Canadian land mass. The only way to transition these critical communications services into a smaller amount of spectrum is through highly costly investments in new satellite infrastructure. For example, in the United States, to clear just 75% of the spectrum Telesat is proposing to be cleared in Canada will require an investment in new satellite infrastructure estimated at U.S.\$3.6B, including 14 new satellites.²

² Intelsat is forecasting seven new satellites, SES is forecasting six new satellites, and Eutelsat is forecasting one new satellite in the FCC process.

6 It is also important to underscore that Telesat operates in a fiercely competitive, global market and, unlike other Canadian telecommunications and broadcasting undertakings that operate in a closed domestic market, decisions made by foreign jurisdictions can have a significant impact on Telesat and the broader 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 US\$8.9 Billion in clearing incentive payments in addition to ~US\$3.4 Billion in clearing costs, which includes 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. 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 United States – and on a more aggressive timeline – without an ability to receive meaningful economic value to offset the highly costly and technically challenging clearing process. For the avoidance of doubt, in the absence of such economic value, 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 hundreds of thousands of Canadians every day.

7 And yet, accelerating the availability of 3800 MHz is critically important to Canada. To date, the Department has laid out a spectrum roadmap that will make 200 MHz of 3500 MHz spectrum available for 5G deployment in June of 2021. However, spectrum band incumbents (notably Bell, Rogers, and Xplornet) will retain nearly half of this spectrum, with another 50 MHz of spectrum being set aside for regional operators to facilitate wireless competition and foster wireless affordability. Allocating only 200 MHz of spectrum across three national carriers and one regional carrier per region means that each carrier will have access to, on average, just 50 MHz of spectrum. But 50 MHz per carrier is not enough spectrum. Unleashing the full

benefits of affordable, optimum 5G requires 100 MHz channels.³ As several operators and equipment manufacturers highlighted in the previous consultations on mid-band spectrum, the massive speed and capacity gains enabled by 5G are primarily achieved through the enablement of larger spectrum channels (*i.e.*, "larger pipes"). Whereas LTE efficiency is optimized across 20 MHz channels, 5G is able to support contiguous channel sizes 5x greater – requiring 100 MHz channel sizes for optimum efficiency. For example, the GSMA noted in its recent 5G Spectrum Public Policy Position that reducing mid-band spectrum channel sizes from 100 MHz to 40 MHz reduces peak data rates by 60%; while even 60 MHz channel sizes would require a 64% increase in the number of cell sites relative to the recommended optimum channel size of 100 MHz.

8 To enable multiple carriers to have access to adequate spectrum and compete to provide affordable, optimum 5G, Canada requires 400 MHz, not 200 MHz, of mid-band spectrum. Furthermore, without adding 3800 MHz spectrum to the 3500 MHz spectrum being auctioned next year, the auction will have a significant supply/demand imbalance at that auction with the likely outcome being that all carriers will pay more for their spectrum than they would in a scenario where there is better balance between supply and demand. This will not promote affordable, optimum 5G wireless services across Canada.⁴ And Canadians will not get the full benefits that 5G can provide.

³ This consensus was clearly demonstrated in the Carriers' response to SLPB-004-18, Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band, SLPB-006-17 Consultation on the Spectrum Outlook 2018 to 2022, and SLPB-002-19 Consultation on a Policy and Licensing Framework for Spectrum in the 3500 MHz Band; and was recently reiterated in the GSMA's 2020 position paper on 5G spectrum, [5G Spectrum, GSMA Public Policy Position](#), March 2020.

⁴ As Rogers noted in their response to the SLPB-002-19: Consultation on a Policy and Licensing Framework for Spectrum in the 3500 MHz Band "While spectrum is undeniably a valuable public resource, it must be recognized that high spectrum prices are bad for the Canadian economy, the wireless industry and for consumers and businesses, who ultimately pay for them"

9 As Telesat noted in the previous consultation on 3800 MHz, Telesat is currently using all 500 MHz of 3800 MHz spectrum (3700-4200), at three different orbital locations, to provide critical services from Coast to Coast to Coast. Today, Telesat serves hundreds of thousands of end users on its 3800 MHz network bringing critical, lifeline services to satellite-reliant and Indigenous communities such as telephony, broadband, public safety, government services and broadcasting. Telesat also provides mission critical services to major Government of Canada departments including Crown-Indigenous Relations and Northern Development Canada, the Department of National Defence, the Royal Canadian Mounted Police, Health Canada, Natural Resources Canada, Fisheries and Oceans as well as the Canadian Coast Guard. Furthermore, Telesat's 3800 MHz spectrum plays an important role in the energy sector, providing connectivity and critical monitoring services across Canada. Lastly, Telesat provides the essential connectivity for the North Warning System over its 3800 MHz network. Telesat has invested a total of approximately CDN \$1.5 Billion in infrastructure, both on the ground and in space, to provide essential services over 3800 MHz.

10 Telesat recognizes the manifold benefits that making additional mid-band spectrum available for 5G 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, where Telesat will clear 200 MHz of 3800 MHz spectrum concurrently with the June

As Bell noted in their response to the SLPB-002-19: Consultation on a Policy and Licensing Framework for Spectrum in the 3500 MHz Band "When spectrum costs are driven up, consumers end up paying more."

In TELUS' response to the SLPB-002-19: Consultation on a Policy and Licensing Framework for Spectrum in the 3500 MHz Band, they reference a report by NERA Economics stating that there is "a link between high spectrum costs, and lower investments and higher consumer prices."

2021 3500 MHz process, facilitating multiple 100 MHz contiguous channels and enhancing sustained wireless carrier competition. Specifically, Telesat proposes that:

- I. As the lone 3800 MHz satellite licensee, Telesat is uniquely positioned to lead this process and will clear 200 MHz of spectrum (3700 – 3900 MHz)⁵ on the same timeline as the 3500 MHz clearing process set out in the Department's 2019 Decision on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Decisions on Changes to the 3800 MHz Band.
- II. Telesat would be granted a flexible use license for the 200 MHz of spectrum and would make this spectrum available in the secondary market to be used by the wireless carriers.
- III. Telesat will then clear an additional 200 MHz of the 3800 MHz spectrum from 3900 – 4100 MHz by December 5, 2025. Consistent with past ISED spectrum repurposing decisions where a portion of the converted spectrum band was returned to ISED, Telesat would return this 200 MHz to ISED which could in turn auction it at its discretion. Unlike the 3700 – 3900 MHz spectrum, which would be addressed in a consultation on this proposal, this incremental spectrum would likely require a further licensing consultation.
- IV. In order to free up spectrum while protecting continuity of service to current users, who are currently being served by the use of all 500 MHz of 3800 MHz on multiple satellites today, Telesat will invest in new facilities and satellites (particularly Telesat's state-of-the-art Low Earth Orbit satellite constellation (Telesat LEO),

⁵ In addition to clearing 3700-3900 MHz, Telesat will clear a 20 MHz guard band from 3900-3920 MHz.

which is a core part of Telesat's plan to continue to provide services to all of its customers) in an amount equal to its net proceeds (*i.e.* after deducting expenditures related to clear the spectrum) from the sale of the 3700-3900 MHz spectrum rights. For the avoidance of doubt, without the funding needed to invest in these 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.

- V. The residual 100 MHz of 3800 MHz spectrum, from 4100-4200 MHz, will remain for satellite use.

11 As noted directly above, Telesat LEO is a key part of Telesat's plan to clear 3800 MHz spectrum and 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 Low Earth Orbit 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.

12 Not only will Telesat LEO help affordably bridge the digital divide well in advance of the Government's 2030 objective,⁶ it represents billions of dollars in economic value to Canada, bringing tremendous Industrial benefits and growth opportunities to the domestic space and telecommunications ecosystems. With its Canadian partners, Telesat LEO will help create and maintain approximately 1,000 high-skilled STEM jobs, as well as position the Canadian space

⁶ In 2019, Telesat and the Government of Canada signed an MOU leveraging Telesat's state-of-the-art LEO constellation to provide affordable broadband services across Canada in an effort to reach universal connectivity. <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11543.html>

ecosystem for long-term sustainable success in the highly strategic and export driven space sector.

13 Telesat believes this proposal brings tremendous benefits to Canadians as it meets Canada's public policy objectives and priorities as laid out in the Innovation and Skills Plan, facilitating the rapid deployment of affordable, optimum 5G across Canada.

- I. **Affordability:** This proposal will contribute towards the Government's policy of wireless affordability and reducing wireless phone prices by 25%. This will be achieved by providing the wireless carriers certainty they will have access to significant incremental mid-band spectrum capacity in the near term, allowing them to invest in a more efficient deployment of optimum 5G infrastructure. In addition, increasing the supply of mid-band spectrum by an incremental 200 MHz of spectrum concurrent with the 3500 MHz auction better balances spectrum supply with carrier demand, leading to lower spectrum acquisition costs.
- II. **Global 5G leadership:** Under the current spectrum roadmap, wireless carriers will not have access to 100 MHz of spectrum but instead will have, on average, access to only half that much spectrum. Access to 400 MHz of mid-band spectrum on an accelerated schedule provides the bandwidth needed to deliver affordable, optimum 5G on a timeline and at speeds and capacity that will position Canada at the forefront of 5G deployments worldwide.
- III. **Universal connectivity:** 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. This proposal will accelerate the timelines for universal connectivity in two important ways. First, wireless carriers will have the

opportunity to acquire adequate spectrum to provide affordable optimum 5G, making better broadband and other 5G-enabled services more widely available to Canadians. Second, Telesat will be investing all of its 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.

IV. Maintaining critical services: Lastly, Telesat will be fully responsible for ensuring the 3800 MHz band is cleared on schedule, while safeguarding all 3800 MHz customers' services as they are cleared and transitioned onto the remaining spectrum, Telesat LEO or other satellites, as required. Clearing this spectrum is a highly costly and technically challenging undertaking and one that only satellite operators would be able to undertake: it is simply not possible to clear 3800 MHz spectrum quickly and still maintain services to existing users unless the satellite operators manage the process. As noted above, the services provided over 3800 MHz are absolutely critical, whether it be the provision of the sole source of connectivity for a remote Indigenous community, the enablement of monitoring & control for our provincial hydro infrastructure, the delivery of broadcast content across Canada, or the day-to-day support of Canada's national security.

14 Telesat strongly believes a focused and concise Industry consultation is warranted given the extensive consultation on this spectrum to date, coupled with the broad consensus across the industry as it relates to this band and the demand for the timely deployment of the new services that the proposal would enable. Furthermore, the affordable deployment of 5G across Canada requires significant planning and a timely decision on how ISED intends to move forward with

this spectrum will provide the industry with the certainty and stability necessary to plan accordingly.

15 The long-term impact and realities of COVID-19 are just beginning to be understood and, now more than ever, industry and governments need to come 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. Such connectivity is essential for universal healthcare and universal education, while Canada's 5G networks will supply the mission critical infrastructure required to enable all Canadians to actively participate in today's digital economy. Furthermore, while Canada's wireless carriers have admirably risen to the challenge of COVID-19, the difficulty of maintaining network availability in the face of a massive surge in remote usage is abundantly clear. Now more than ever, it is essential that Canada have access to universal, affordable world-class 5G technologies 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.

16 Telesat would like to thank ISED for its consideration of the following proposal for the reallocation of the 3700-4100 MHz band for terrestrial flexible use and would welcome the opportunity to participate in an expedited and focused Industry consultation.

II. INTRODUCTION

A. TELESAT'S EXPERIENCE

17 Since its creation through an Act of Parliament in 1969, Telesat has met the Canadian government's original policy objective for the company: to connect all of Canada, including its most remote and rural areas, with innovative, affordable and highly reliable satellite communications services. In addition, Telesat has reached far beyond that original objective and today is one of the largest and most successful satellite operators in the world.

18 Telesat launched the world's first domestic commercial geostationary orbit (GSO) satellite in 1972, providing Hockey Night in Canada and telephony services from Coast to Coast to Coast. During the almost 50 years since then, it has evolved into a diversified, global satellite services company, with an unparalleled reputation for innovation, technical and operational expertise and customer service.

19 In 2007, Telesat acquired the business of Loral Skynet, a U.S. company with a strong technical background tied to the achievements of AT&T Skynet, Bell Labs and the Telstar programs. As a result, Telesat greatly expanded its coverage and transitioned into a truly global operator with ties to four licensing administrations: Canada, the U.S., Brazil and the United Kingdom. Telesat's world-class technical, operational, research & development, and commercial teams have developed and grown its business in numerous international markets.

20 Today, Telesat is one of the world's most successful satellite operators, providing reliable and secure satellite-delivered communications solutions worldwide to broadcast, telecom, corporate and government customers, including the Government of Canada. From its headquarters in Ottawa, Telesat conducts all of its advanced engineering, R&D, and the tracking,

telemetry and control of its fleet of 16 state-of-the-art satellites. Telesat's satellites serve millions of Canadians, delivering high quality video content as well as voice, Internet and wireless LTE connectivity to rural and remote parts of Canada that are beyond the reach of cable and fibre.

21 As noted above, Telesat's state-of-the-art, revolutionary LEO satellite constellation will deliver affordable, fibre-like broadband connectivity supporting the deployment of broadband, LTE and 5G everywhere on Earth, including to the entirety of Canada. The Telesat LEO constellation is an advanced, space-based broadband infrastructure that leverages the most state-of-the-art technologies, including advanced manufacturing, on-board data processing, active digital antennas, optical laser links between satellites, machine learning and Artificial Intelligence. Telesat and its partners are leveraging these advanced technologies in a highly innovative manner in order to revolutionize the performance and economics of broadband connectivity throughout the world.

B. BACKGROUND AND CONTEXT

22 In June 2018, ISED released the Spectrum Outlook 2018 to 2022 (the Spectrum Outlook), which allocated the 3800 MHz band as Priority 2 for development, meaning that ISED expected to begin work on policy development for the band. Priority 2 bands were potentially to be released between 2018 and 2022, subject to international developments such as WRC-19 and equipment availability.

23 In June 2018, ISED also issued SLPB-004-18, Consultation on Revisions to the 3500 MHz Band to Accommodate Flexible Use and Preliminary Consultation on Changes to the 3800 MHz Band, in part to assess the prospects for the 3800 MHz band (2018 Consultation). In the subsequent SLPB-001-19, Decision on Revisions to the 3500 MHz Band to Accommodate

Flexible Use and Preliminary Decisions on Changes to the 3800 MHz Band (2019 Decision) released on June 5, 2019, ISED announced an intention to launch a future consultation on changes to the Canadian Table of Frequency Allocations (CTFA), spectrum utilization policy, band plan, as well as the potential for implementing a Spectrum Access System (SAS) or similar database and technical and policy considerations to optimize the use of the 3700-4200 MHz band. ISED targeted a planned release for this spectrum in 2022 and advised new licence applicants of the high potential for changes in the band. This decision was motivated, in significant part, by a conclusion that more work was necessary to identify a suitable transition plan that would adequately protect the interests of existing FSS users.

24 ISED subsequently released SLPB-001-20, Policy and Licensing Framework for Spectrum in the 3500 MHz Band (the 3500 MHz Framework), including a provisional timeline for an auction process for the 3500 MHz band, with bidding to begin on December 15, 2020. This has since been delayed six months, to June 15, 2021, as a result of COVID-19.

C. RECENT DEVELOPMENTS IN THE 3800 MHz BAND

25 On February 28, 2020, the Federal Communications Commission (FCC) in the United States adopted rules for an auction of 280 MHz of spectrum in the 3800 MHz band (specifically, 3700-3980 MHz, with a guard band of 20 MHz from 3980-4000 MHz) for flexible use. Under the FCC Report and Order and Order of Proposed Modification, FSS operators will be eligible to receive reimbursement for clearing costs forecasted (by the satellite operators) at approximately US\$3.6 Billion plus an additional US\$9.7 Billion in direct incentive payments from new licensees, if they meet certain milestones for transitioning existing services on an accelerated schedule. The two largest operators, Intelsat and SES, will receive US\$4.9 Billion and US\$4.0 Billion (respectively) in incentive payments as well as an estimated approximately US\$3.4

Billion in total expense reimbursements, including the cost of 13 new satellites, based on public filings with the FCC. The incentive payments were based on the FCC's evaluation of the tremendous public benefits created by making spectrum available for 5G on an accelerated basis,⁷ while recognizing the criticality of preserving the continued operation of existing satellite services during and after the transition.

26 The U.S. spectrum will be cleared in two phases. The first phase targets clearing the lowest 100 MHz (3700-3800 MHz), plus a 20 MHz guard band, by December 5, 2021 in most major metropolitan areas. The second phase would clear the 3800-3980 MHz, plus a 20 MHz guard band, repacking existing FSS services into the 4000-4200 MHz band, by December 5, 2023. To be eligible to receive the transition payments, satellite operators must take all steps necessary to allow incumbent earth station operators communicating with the satellite operators' networks to continue to receive substantially the same service during and after the relocation that they were able to receive before the transition. If satellite operators fail to achieve the timeline required for the incentive payments, they will nonetheless have to clear the entire 3700-4000 MHz band no later than December 5, 2025.

27 The FCC process has forced satellite operators with a North American footprint, including Telesat, to consider in detail the highly complex logistics of clearing the 3800 MHz spectrum. The operators have since submitted their clearing plans to the FCC. Furthermore, the U.S. commitment to re-purpose the spectrum for terrestrial use ensures that there will be an

⁷ 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. 215 ("We start by examining the value to the American public of an accelerated transition.")

ecosystem for 5G equipment and services within that band. This presents an opportunity for Canada.

D. THE OPPORTUNITY FOR CANADA

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

III. FLEXIBLE USE IN THE 3800 MHZ BAND

29 The consensus is clear: the Department should enable terrestrial flexible use in the 3800 MHz band. The real and pressing question is how this can be accomplished.

30 The Department has recognized this potential in the Spectrum Outlook and the 2019 Decision. This issue has been addressed at length in multiple rounds of consultation and the only significant barrier to moving ahead has been the challenge of addressing the needs of existing FSS users. Telesat's proposal (discussed in more detail below) solves that problem, clearing the way to proceed with flexible use.

IV. TRANSITION PLAN FOR INCUMBENTS IN THE 3800 MHZ BAND**A. FIXED SATELLITE SERVICE (FSS)**

31 3800 MHz FSS services continue to be in high demand. 3800 MHz FSS provides critical services to rural, remote and Indigenous communities across Canada and is an integral part of the energy, broadcast distribution and national security infrastructure throughout Canada, including as described in the submissions to the 2018 Consultation and the 2019 Decision. The release of the 3800 MHz band for terrestrial use cannot come at the expense of existing users of 3800 MHz FSS services. These services are absolutely vital to Canadians and to Canada. Any reallocation of the 3800 MHz band must be predicated on protecting the continuity of these important services.

32 In previous transitions, such as the AWS-4, 600 MHz, 700 MHz, and 2500 MHz bands, and most recently in 3500 MHz, ISED provided incumbents with alternative spectrum rights and transitional periods, to mitigate the impact of the reallocations on providers and users. By policy, the users generally bear the costs of any equipment changes, either directly or indirectly.

33 Telesat is the only space station spectrum licensee in the 3700-4200 MHz band providing commercial FSS services. Telesat currently uses the entire 500 MHz downlink band for commercial service throughout Canada from satellites in multiple orbital locations. Two non-Canadian operators of space stations on the list of foreign satellites approved to provide FSS in Canada (SES and Intelsat; together with Telesat, the Satellite Operators) also currently provide services in Canada in the band.

34 Based on initial technical studies and development of preliminary transition plans relying in part on the availability of Telesat LEO, Telesat believes that it would be technically possible

to clear a substantial portion of Canadian 3800 MHz usage, on a timeline similar to the U.S. and consistent with the Canadian 3500 MHz process. In fact, Telesat believes that it would be possible to go farther, and faster than the U.S. process.

35 Telesat proposes a two-stage transition. The first stage can release the lowest 200 MHz of the 3800 MHz band (*i.e.* 3700-3900 MHz), rather than only 100 MHz as has been designated in the U.S. Taken together with the 3500 MHz band that has been designated for auction, this would make 400 MHz of nearly-contiguous spectrum (in two contiguous 200 MHz blocks) available for 5G deployment by Canadian licensees compared with 280 MHz in the U.S.

36 The second phase, which Telesat believes could be completed by December 5, 2025, would clear the 3900-4100 MHz (3900 MHz) band (which would include a 20 MHz guard band), leaving only the 4100-4200 MHz (4100 MHz) band available for long-term FSS use.

37 Furthermore, Telesat believes that – provided investment is made in new facilities, principally Telesat LEO – this can be accomplished with no loss of service to existing end users. This would be accomplished through a combination of re-packing existing use within the remaining 3800 MHz spectrum and migrating Telesat users to Telesat LEO and, potentially, other satellites.

38 While Telesat believes this transition timing is achievable throughout Canada, Telesat anticipates that the Minister would retain the discretion to delay either or both stages of the transition in designated geographic areas if necessary to maintain continuity of existing services, particularly in satellite-dependent communities in the North. Telesat understands that accountability is important and will report to the Minister during the transition period on the

progress of transitional arrangements, as the Minister may direct, and will inform the Minister if it becomes aware of any risk to the continuity of existing services to FSS users.

39 However, this transition would require a substantial investment. Under the FCC process in the U.S., incumbent licensees will be compensated for these costs (in addition to the US\$9.7 Billion early clearing incentive payments). For the avoidance of doubt, clearing a portion of the 3800 MHz spectrum for reallocation without substantial loss of service to existing users will be a highly complex and costly undertaking. It 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. Recent filings with the FCC in connection with the U.S. transition process demonstrate this complexity, with dozens of pages devoted to detailed descriptions of facilities updates and replacements, including the construction and launch of 14 new satellites, and a total estimated cost of at least US\$3.6 Billion.⁸

40 The transition process in Canada will be equally complex. Only Telesat, as Canada's sole FSS satellite licensee in the 3800 MHz band, has the ability to successfully lead and execute this transition. Other than a satellite operator-led clearing, there is simply no other practical way to release any portion of the 3800 MHz spectrum for terrestrial use without widespread loss of critical services to current FSS users. And the sooner this transition is executed, the more value created by the earlier roll-out of affordable, optimum 5G, (recognizing that hastening the speed of transition correspondingly increases the cost and the complexity of the clearing). Given this

⁸ FCC, GN Docket No. 20-173: Transition plan filed by SES (June 19, 2020) available at <https://ecfsapi.fcc.gov/file/106190371922160/SES%20Americom%2C%20Inc.%20Accelerated%20C-Band%20Transition%20Implementation%20Plan.pdf>; Transition plan filed by Intelsat (June 19, 2020) available at <https://ecfsapi.fcc.gov/file/106190607411191/Transition%20Plan%20-%20Intelsat%206-19-2020.pdf>.

economic reality, the transition can only be accomplished on the proposed highly accelerated timeline if, as in the U.S., satellite operators receive value in exchange for their critical role in the process and the substantial costs they will incur in managing the migration of existing users to new satellite facilities, facilities required to ensure continuity of these users' critical services.

B. RELEASE PROCESS

41 Freeing up 400 MHz for terrestrial use, including for 5G, will create enormous value for Canada and for the wireless providers. Consistent with ISED policy that the costs of a spectrum reallocation are to be borne by the spectrum users, Telesat is proposing a mechanism by which the Canadian telecommunications industry can fund the extensive investments in alternative facilities needed to unlock this value. Specifically, Telesat proposes that releasing a portion of the cleared spectrum through the secondary market will allow for an economically efficient private allocation of the costs and benefits of the transition. The Department has previously approved similar arrangements for the 2500 MHz and AWS-4 bands.⁹

42 Telesat proposes that the first block of spectrum, being the 3700-3900 MHz band, should be licensed for terrestrial flexible use, through an initial Tier 1 flexible use licence issued to Telesat. Telesat would make that spectrum available in the secondary market, through licence subdivisions and transfers or subordinations in accordance with the Department's existing policies for commercial mobile spectrum. Telesat would then use the proceeds of such secondary market transactions to cover all the costs of the transition, including by investing in Telesat LEO,

⁹ 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>.

which is currently in development, and which is a core part of Telesat's plan for providing continuity of service.

43 The Department's existing policies, including CPC 2-1-23, Licensing Procedure for Spectrum Licences for Terrestrial Services and the Framework Relating to Transfers, Divisions and Subordinate Licensing of Spectrum Licences for Commercial Mobile Spectrum provide for case-by-case approval of such transactions, with consideration given to market concentration and other policy concerns. This provides a ready mechanism for the Minister and the Department to ensure that the secondary market transactions do not distort the competitive landscape. In any case, the substantial increase in available mid-band spectrum would be inherently pro-competitive, since it would allow more competitors to each have access to sufficient mid-band spectrum to deploy 100 MHz channels throughout the country.

44 Telesat takes no position as to whether additional, incremental pro-competitive measures would be necessary for the 3800 MHz band, given the existing discretionary authority of the Minister to approve or reject any transfer, subdivision or subordination of the spectrum rights. However, Telesat considers it essential that such measures (if any are to be imposed) must be:

- fully addressed in the Department's consultation and decision relating to this proposal, and not be deferred to a future consultation process, in order to avoid unnecessary delays;
- practically capable of being implemented in the context of the secondary market transactions contemplated by this proposal; and

- not substantially undermine Telesat's ability to recoup enough value through the secondary market to underwrite the extensive investments required for a successful transition.

45 Similarly, Telesat takes no position on whether a spectrum cap would be necessary or appropriate in the 3800 MHz band. Telesat notes that the Department concluded that a spectrum cap would be ineffective and would be likely to have negative consequences in the 3500 MHz band.¹⁰ If the Department chooses to impose a set-aside in the 3800 MHz band, Telesat suggests that, for the same reasons and for consistency between the bands, no spectrum cap should be applied.

46 One possible model that could be considered would be to designate a portion of the band – hypothetically, the 50 MHz from 3850-3900 MHz – to be offered at first instance to a class of eligible bidders to be defined by the Department, subject to a time limit for bids and a reserve price to be defined on a \$/MHz-Pop basis by Telesat (in consultation with the Department). Telesat would accept bids from eligible bidders for one or more 10 MHz blocks within any Tier 4 service area and, provided the reserve price was met, would transfer or subordinate the spectrum to the high eligible bidder in each case (subject to the Minister's approval in accordance with existing regulatory policies) on commercial terms to be negotiated between the parties. If any block transaction failed to close for any reason, Telesat would proceed to the next-highest eligible bidder for that block until all bids that met the reserve price were exhausted. Blocks for which the reserve price was not met by the bid deadline, or for which no transaction with an

¹⁰ Policy and Licensing Framework for Spectrum in the 3500 MHz Band, SLPB-001-20, para. 42.

eligible bidder could be concluded (if any), would subsequently be available to the broader market with no further limitations beyond Ministerial approval.

47 The 3900-4100 MHz band would be returned to the Department, and could be allocated through public auction or otherwise at the Department's discretion. Telesat anticipates that an additional consultation would be appropriate to establish the licensing model for 3900-4100 MHz.

C. EARTH STATIONS

48 Telesat, working with the other Satellite Operators, would take 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. In many cases, this will include migrating the Telesat services onto the Telesat LEO constellation or other alternative satellites. The Satellite Operators will provide or procure comparable facilities and services, and would cover reasonable, direct, out-of-pocket expenses incurred by the Eligible Earth Station operators as a result of the transition, provided that they receive reasonable cooperation in the process, including access to technical information and facilities.

49 In order to facilitate the transitional arrangements for these earth 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.

50 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.

51 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.

D. GATEWAY PROTECTION

52 In order to maintain continuity of services, Telesat and the other Satellite Operators would need to retain the use of the full 3700-4200 MHz band at two existing TT&C/gateway sites. Telesat therefore proposes that exclusion zones should be established for these sites, on an exceptional basis. Technical parameters for such an exclusion should be defined to be consistent with 3500 MHz. The existing sites are located outside of large urban areas where such exclusion

zones should have a limited impact on terrestrial services. Telesat does not anticipate that any new TT&C/gateway sites will be required in order to maintain existing services.

E. OTHER LICENSEES

53 Apart from FSS, there are currently a small number of fixed point-to-point links in operation in the 3700–4200 MHz band in Canada, which are mainly used for backhaul.

54 In previous spectrum reallocations, the Department has adopted a "where and when necessary" principle. Generally, incumbent licensees who do not voluntarily transition to alternative spectrum are permitted to continue operating where such operations do not prevent deployment by new licensees. Telesat believes this principle should apply to the handful of incumbent point-to-point licensees in the 3800 MHz band.

55 Specifically, ISED should extend the transition measures, including the protection and notification periods, set out for the 3500 MHz band in the 2019 Decision to the 3700-3900 MHz band. As set out in with the 2019 Decision, Telesat proposes that:

- existing licensees be protected from having to transition for a minimum period of time spanning six months for licensees in large urban centres (including a 10 km buffer zone), two years for licensees in tiers with a population centre of 30,000 people or more, or three years for licensees in tiers without a population centre of at least 30,000 people); and
- existing licensees in large urban population centres and in the 10 km buffer zone surrounding those centres be provided with a minimum notification period of 6

months; and that those in all other areas be provided with a minimum notification period of one year.

V. SPECTRUM POLICY CONSIDERATIONS

A. BAND PLAN AND ALLOCATION

56 In the 2019 Decision, ISED implemented a 3500 MHz band plan composed of 20 unpaired blocks of 10 MHz, providing a channel spacing size supported by both 4G Long Term Evolution (LTE) and 5G New Radio (NR) equipment. For the same reasons, Telesat recommends that a similar band plan composed of unpaired 10 MHz blocks be adopted for the 3700-4100 MHz band. These blocks could be aggregated into contiguous sets to facilitate large bandwidth channels, which are optimal for 5G technologies.

57 Conforming updates would also be needed to the Canadian Table of Frequency Allocations and the Spectrum Utilization Policies to add a primary allocation for the Mobile service in the 3700-4100 MHz band. These are relatively straightforward, but Telesat notes that they would need to be included in the scope of the Department's consultation and decision relating to this proposal, in order to avoid any unnecessary delay.

B. CROSS-BORDER ISSUES

58 Telesat has proposed that Canada could clear the 3800 MHz band faster than the U.S. would under the FCC's transition plan. As a result, there would be a period during which Canadian terrestrial licensees in the 3800-3900 MHz range may temporarily need to accept cross-border signals from continuing FSS service in the U.S. Interference from FSS downlink signals will not, however, impose any significant difficulty for Canadian terrestrial operators as

the downlink signals are far too weak to cause harmful interference to terrestrial fixed or mobile services.

59 However, U.S. FSS earth stations near the Canadian border may seek protection from interference from Canadian terrestrial fixed and mobile operators. Any such arrangement will presumably only be necessary until the Phase 2 transition in the U.S. or, in the worst case, the FCC's proposed 2025 sunset date for U.S. FSS operations in the band. Given the limited number of U.S. earth stations near the Canadian border, Telesat does not anticipate that this will impose material restrictions on terrestrial fixed or mobile services in 3700 – 3900 MHz.

60 As set out in the 2019 Decision, ISED intends to work with the FCC on a new cross-border arrangement that would protect new Canadian and U.S. flexible use services in the 3500 MHz band in the areas near the Canada–U.S. border. Telesat suggests that ISED could include the 3800 MHz band in those discussions.

C. CONDITIONS OF LICENCE

61 Telesat proposes that conditions of licence for FSS in the 3800 MHz band remain unchanged, except that new conditions be added to make FSS use secondary to terrestrial use, after the transition periods described above. In order to promote maximum flexibility, FSS use should continue to be authorized on a no-interference, no-protection basis in the 3700-4100 MHz band, and on a primary basis in the 4100-4200 MHz band.

62 From a terrestrial perspective, the 3800 MHz band is substantially the same as the 3500 MHz band. In particular, for 5G, the primary competitive benefit of the accelerated release of the 3800 MHz band is that it will allow more operators to deploy more bandwidth. This, in turn, assumes that operators will be able to use 3500 MHz and 3800 MHz spectrum interchangeably.

63 This suggests that the licence conditions for flexible use in 3800 MHz should generally align with the conditions that ISED has defined for 3500 MHz. In particular, the licence terms should be co-terminus to facilitate coordinated treatment of the extended band in the future.

64 Similarly, deployment requirements for terrestrial operators should be harmonized across the bands for consistency, including the distinction established for 3500 MHz between LTE mobile operators and other licensees. Given that the two bands will be used by wireless providers to provide the same service, to the same population, wireless service providers using 3500 MHz, 3800 MHz, or portions of both bands together for mobile services, should be subject to the same deployment requirements. None of these deployment scenarios should be either privileged or disadvantaged relative to the others. Therefore, Telesat recommends that population served using 3500 MHz or 3800 MHz, or both, should be treated interchangeably for the purpose of any deployment requirement. These deployment requirements would commence on the date of Ministerial approval of any transfer or subordination by Telesat.

D. MORATORIUM IN THE 3800 MHz BAND

65 The 3800 MHz band has been available on a first-come, first-served basis for fixed and fixed satellite service licences. In order to enable the potential changes raised in this proposal, Telesat recommends that ISED place a moratorium on new applications for fixed service licences in the 3800 MHz band that would start on the date of the 3800 MHz Consultation. Telesat suggests that ISED would retain the discretion to issue new fixed satellite service licences if necessary in order to enable the transition and continued delivery of existing services. Any such new licence should be subject to the same (or substantially the same) conditions of licence described in paragraph 61, above. Furthermore, ISED should clarify that new licensees

(if any) would not be eligible to receive a flexible use licence through the transition process described in this proposal.

VI. CONCLUSION

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

- enable flexible use of the 3800 MHz band;
- grant Telesat a Tier 1 terrestrial flexible use licence in the 3700-3900 MHz band, which Telesat would be free to exploit, transfer, or subordinate in accordance with existing regulatory policies for commercial mobile spectrum; and
- provide Telesat with all available information about licensed and unlicensed earth stations that currently use the 3700-4100 MHz band.

67 In return, Telesat would take responsibility for:

- clearing the 3700-3900 MHz and 3900-4100 MHz bands, on the timelines set out above; and
- managing transitional arrangements – including investing in new satellite facilities, including Telesat LEO – to avoid loss of or disruption to existing services to eligible users in Canada.

All of which is respectfully submitted on behalf of TELESAT CANADA

/s/ _____

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