



REPLY COMMENTS OF TELESAT CANADA

In response to:

Canada Gazette, Part I, June 17, 2017, Consultation on Releasing Millimetre Wave Spectrum to Support 5G, SLPB-001-17

TELESAT CANADA

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REPLY COMMENTS OF TELESAT CANADA

1 Telesat is pleased to offer these reply comments on the *Consultation on Releasing Millimetre Wave Spectrum to Support 5G*, SPLB-001-17 (the “**Consultation Document**”)¹ issued by Innovation, Science and Economic Development Canada (“**ISED**” or the “**Department**”).

I. INTRODUCTION

2 The comments filed in response to the Consultation Document identify a number of common themes, including support for ISED’s over-arching objectives of promoting innovation, investment and evolution of wireless 5G networks and facilitating deployment and availability of services across Canada. As Telesat and other commentators have also underscored, 5G is expected to comprise a heterogeneous network of networks supporting a variety of evolving use cases and requirements, in which satellite services will play a critical role. The deployment of terrestrial 5G services is also expected to be focused in dense urban/suburban centres and high traffic hotspots. Fixed satellite services (FSS) will play an essential role in extending 5G services to the many Canadians who live and work outside these areas, and may also support and complement terrestrial 5G in areas where it is deployed. It is essential, therefore, that sharing principles and methodologies be carefully considered, to ensure appropriate coexistence of terrestrial and satellite infrastructure in the 28 GHz and 37-40 GHz bands.

3 Consistent with these principles, the Radio Advisory Board of Canada (the “**RABC**”), Telesat, and many other commentators have proposed that ISED initiate studies to establish appropriate sharing rules, including suitable geographic limitations on the siting of earth stations.

¹ Published in the *Canada Gazette*, Part I, June 5, 2017.

However, several commentators have proposed blanket earth station siting restrictions that are not tailored to Canadian geography, demographics or requirements, expected 5G deployment or multilateral study. Even with limited scrutiny, it is apparent that these proposals are unnecessarily restrictive and imprecise.

4 In an attempt to support aggressive geographic limitations on earth station siting, TELUS suggests that satellite operators seeking more flexibility in earth station deployment can use other spectrum. This proposition is misguided. Large contiguous bandwidth is required for satellite provision of high capacity broadband and 5G services – services which satellite will be the only feasible means of delivering in many parts of Canada. There is insufficient bandwidth for satellite provision of these services at C-band and Ku-band and use of higher frequency bands (e.g. 71-76 GHz and 81-86 GHz) is beyond current technological capability. This leaves only the Ka and V/Q bands with sufficient bandwidth and technological capability to support satellite broadband and 5G services. Within these bands, satellite providers need both dedicated spectrum for unrestricted user terminal use, and feeder link spectrum which can be shared with terrestrial flexible use. The 28 and 37-40 GHz bands that are the subject of the Consultation Document are required by satellite operators for feeder links supporting satellite broadband and 5G services.

5 For these reasons and as discussed more fully below, Telesat urges ISED to reject the earth station siting restrictions proposed by the large wireless carriers and calls to rubber-stamp rules established by the Federal Communications Commission (the “FCC”) in the United States, and requests the Department to adopt the recommendation of the RABC, Telesat, and many

others to initiate a study or studies to determine coordination and sharing mechanisms, including suitable siting restrictions, consistent with Canadian objectives, geography and demographics.

II. REPLY COMMENTS

6 As with Telesat’s comments, questions and issues identified in the Consultation Document are set out below, highlighted in grey, with Telesat’s reply comments on each issue following.

B. BACKGROUND AND CONTEXT

Question 4-1: Given the disruptive nature of 5G, will new business models and network applications develop that may require policy and regulatory consideration from ISED? Please describe potential new business models and network applications as well as their benefits to Canadians.

Spectrum policy should support satellite as an integral component of the evolving 5G ecosystem

7 The RABC and satellite operators uniformly note that satellite will play a key role in the 5G ecosystem.² In this regard, the RABC states:

6. b. A new facet of 5G is that it is envisioned to comprise a heterogeneous network of networks. 3GPPP is studying the inclusion of satellite within 5G. Satellite systems provide geographic coverage of all of Canada, including territorial waters. Where terrestrial networks are not economic or are temporarily affected by natural disaster, innovative new satellite systems could

² RABC Comments, SLPB-001-17, 15 September 2017 (“RABC Comments”), para. 6.b; Telesat Comments, SLPB-001-17, 15 September 2017 (“Telesat Comments”), paras. 9-12; Broadband Satellite Operators Comments, SLPB-001-17, 15 September 2017 (“BSO Comments”), para. 15; Xplornet Comments, SLPB-001-17, 15 September 2017 (“Xplornet Comments”), page 3; Viasat Comments, SLPB-001-17, 15 September 2017 (“Viasat Comments”), page 4; Ciel Comments, SLPB-001-17, 15 September 2017 (“Ciel Comments”), para. 3; Intelsat Comments, SLPB-001-17, 15 September 2017 (“Intelsat Comments”), page 1.

provide backhaul/transport connectivity and capacity for 5G as well as 5G compatible mobile satellite service/IOT. To this end, the RABC recommends that the Department support, through future policy and regulatory measures in-line with 3GPP developments, the introduction of satellite systems to support and extend 5G networks.³

8 Other key themes in the comments are:

- 5G use cases are varied and require differing capabilities;⁴
- Standards development is ongoing and there remains uncertainty about how and when 5G will be deployed, the business models and applications;⁵
- It will not be economic to deploy 5G across an entire terrestrial network;⁶ and
- Terrestrial deployment of 5G will focus on areas of high traffic demand or specific locations requiring very high capacity⁷ and practical terrestrial deployment “will be restricted to urban/suburban centres, major highway corridors, rural community hotspots/gathering places and last mile roadside fixed service”.⁸

9 It is imperative that ISED adopt policies and a framework for shared use of the 28 GHz and 37-40 GHz frequency bands by terrestrial and satellite networks that are consistent with these themes and thereby enable 5G capabilities that benefit all Canadians.

³ RABC Comments, para. 6.b. See also Intel Comments, SLPB-001-17, 15 September 2017 (“Intel Comments”) at p. 2, describing 5G as a heterogeneous network of networks.

⁴ Bell Mobility Comments, SLPB-001-17, 15 September 2017 (“Bell Comments”), paras.10-12; TELUS Comments, SLPB-001-17, 15 September 2017 (“TELUS Comments”), para. 10; Rogers Comments, 15 September 2017 (“Rogers Comments”), para.10.

⁵ SaskTel Comments, SLPB-001-17, 15 September 2017 (“SaskTel Comments”), para. 28; TELUS Comments, para. 11; Rogers Comments, paras. 10 and 38; Intel Comments, p. 2.

⁶ RABC Comments, para. 6.a.

⁷ Bell Comments, para. 13, citing Ofcom, *Update on 5G Spectrum in the UK*, 8 February 2017.

⁸ Bell Comments, para. 39. See also Samsung Comments, SLPB-001-17, 15 September 2017 (“Samsung Comments”), at p. 10 stating that 5G deployment is expected in major venues of urban and suburban areas.

C. CANADIAN APPROACH AND TIMING

Question 5-1: ISED is seeking comments on developing a flexible use licensing model for fixed and mobile services in the 28 GHz and 37-40 GHz frequency bands, and allowing licence-exempt use of the 64-71 GHz frequency band ahead of WRC-19 and before 5G technology standards are finalized.

There is broad acceptance of development of a flexible use licensing model in the 28 and 37-40 GHz bands, provided an appropriate approach to coexistence is established

10 Aside from the comments seeking further investigation of potential health effects of wireless services, there is broad support for, or non-opposition to, the proposal to develop a flexible use licensing model for fixed and mobile services in the 28 GHz and 37-40 GHz bands, provided satellite requirements are accommodated and Canada continues to work closely with the international community on development of allocations and standards for these bands. This broad agreement reflects a common understanding that coexistence of FSS and flexible terrestrial use is possible within a suitable sharing framework. In this regard, and as Telesat noted in its comments, Telesat does not seek to use the 28 GHz and 37-40 GHz bands for ubiquitous deployment of earth stations, but the spectrum in these bands is absolutely critical for the provision of feeder links to and from individually-licensed earth stations.

D. CHANGES TO SPECTRUM UTILIZATION POLICIES – 28 GHz

Question 6-1: ISED is seeking comments on the changes proposed above to introduce flexible use licensing in the 28 GHz band, including consequential changes to the CFTA domestic footnotes and the policy on this band contained in SP 3-30 GHz,

The comments support consequential changes to the CFTA footnotes consistent with continued soft partitioning of the 28 GHz band

11 There is support for consequential changes to footnotes to the Canadian Table for Frequency Allocations (“**CFTA**”) to permit development of flexible use licensing of the 28 GHz band, while maintaining soft partitioning of the band with FSS.

12 Consistent with this objective, Telesat supports the recommendation of the Broadband Satellite Operators (the “**BSO**”) that the word “large” (in reference to earth station antenna) be deleted from footnotes C47A and C47C.⁹ Alternatively and as proposed by Telesat in its comments, a precise definition of “large” antenna, such as an antenna with a diameter of 100 wavelengths or more, should be adopted.¹⁰ Telesat also supports the proposal of the RABC and the BSO, that the footnotes identify the requirement for individual licensing of earth stations.¹¹

13 Conversely, Telesat opposes the inclusion of numeric caps in the footnotes. Such caps are unnecessary and could preclude earth station deployment that will have no material impact on terrestrial 5G services.

14 It is also premature to consider HAPS use of this band, given the lack of an international allocation to HAPS.¹² HAPS will introduce additional sharing issues for both FSS and terrestrial flexible use and could therefore limit the deployment of these services.

⁹ BSO Comments, para. 22.

¹⁰ Telesat Comments, para. 33 and fn. 11.

¹¹ BSO Comments, para. 22; RABC Comments, paras. 17-18.

¹² Facebook Comments, SLPB-001-17, 15 September 2017, pp. 2-3.

E. BAND SHARING WITH OTHER SERVICES – 28 GHz

Question 6-4:

A. ISED seeks comments on its proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the 28 GHz band when a pre-determined trigger threshold is exceeded.

B. If site-by-site coordination is proposed, what coordination trigger and value would be the most appropriate (e.g. PFD or distance threshold)?

C. ISED is also inviting proposals for specific technical rules on proposed flexible use stations and FSS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.

The comments support site-by-site coordination based on a PFD trigger, to be determined through a study initiated by ISED

15 There is broad-based support for site-by-site coordination of earth stations and flexible use 5G terrestrial stations,¹³ use of a PFD coordination trigger,¹⁴ and initiation of a study to determine the appropriate value for this trigger.¹⁵ In addition, there is general recognition that while site shielding and other measures may facilitate sharing, specific measures should not be

¹³ Global mobile Suppliers Association Comments, SLPB-001-17, 15 September 2017 (“GSA Comments”), p. 4; Ericsson Comments, SLPB-001-17, 15 September 2017 (“Ericsson Comments”), p.15; SaskTel Comments, paras. 43-44; Rogers Comments, para. 36; BSO Comments, para. 26; Samsung Comments, p. 9; TELUS Comments, para. 26; Xplornet Comments, SLPB-001-17, 15 September 2017 (“Xplornet Comments”), p. 4; Bell Comments, para. 32; RABC Comments, para. 27; British Columbia Broadband Association Comments, SLPB-001-17, 15 September 2017 (“BCBA Comments”), para. 26.

¹⁴ GSA Comments, p. 4; Ericsson Comments, p. 15; SaskTel Comments, paras. 45-46; TELUS Comments, para. 26; Intelsat Comments, p. 3; Viasat Comments, p. 5; Bell Comments, para. 35; RABC Comments, para. 29; Samsung Comments, p.9; Nokia Comments, SLPB-001-17, 15 September 2017 (“Nokia Comments”), p.4; Rogers Comments, para. 37; BSO Comments, para. 29; Intel Comments, pp. 5-7.

¹⁵ Bell Comments, para. 36; RABC Comments, para. 31; BSO Comments, para. 30; Rogers Comments, paras. 38-39; SaskTel Comments, para. 47.

mandated. Rather, station operators should be permitted to choose and implement the measures that are most cost-effective.¹⁶

16 Several commentators propose use of the PFD coordination trigger adopted by the FCC in its Spectrum Frontiers Report and Order.¹⁷ In contrast to these suggestions, Rogers states that it is premature to conclusively determine a PFD value at this time, as 5G technology is being developed and goes on to support the RABC proposal that a study should be initiated to address this issue.¹⁸

17 The trigger adopted by the FCC has been used for coordination between adjacent terrestrial licensees. This trigger value is not based on any technical sharing studies involving FSS, and is opposed by satellite interests. Furthermore, while 3GPP studies may provide useful input to the study that Telesat has urged the Department to initiate and lead, 3GPP results should not be rubber-stamped *a priori*.¹⁹

18 As stated by the RABC, existing and future earth stations should be permitted to continue to operate in accordance with their conditions of licence.²⁰ This approach provides certainty to

¹⁶ Bell Comments, para. 38; RABC Comments, para. 32; BSO Comments, para. 31; TELUS Comments, para. 30; Ericsson Comments, page 16; SaskTel Comments, para. 48.

¹⁷ TELUS Comments, paras. 28-29; GSA Comments, p. 4; Nokia Comments, p. 4; *Report and Order and Further Notice of Proposed Rulemaking*, FCC-16-89 (14 July 2016). Ericsson suggests use of the FCC value unless further study indicates otherwise. (Ericsson Comments, p. 15)

¹⁸ Rogers Comments, paras. 38-39.

¹⁹ While Bell states that the Department should adopt 3GPP studies, Bell also acknowledges that satellite operators may disagree with the conclusions of the coexistence studies conducted by 3GPP and proposes that the Department initiate a study to determine an appropriate PFD coordination trigger. (Bell Comments, paras. 34 and 36)

²⁰ RABC Comments, para. 26.

licensees that is critical to the investment they make in licensed infrastructure. Moreover, and as previously noted, Telesat does not seek to use the 28 GHz band for ubiquitous deployment of earth stations. There are only a limited number of grandfathered earth stations, and future-licensed earth stations that have satisfied suitable siting criteria should not be subject to additional constraints and uncertainty as a result of subsequent deployment of terrestrial flexible use stations.

19 TELUS suggests that licensed earth station contours be made publicly available.²¹ If flexible use area licences are awarded, the flexible use and earth station operators in an area will be known or easily ascertainable. While it makes sense for these entities to exchange contour information in the coordination process, general publication of satellite contours to those with no coordination interest will only serve to disclose commercially and competitively sensitive information to satellite competitors and should be rejected.

20 Telesat also opposes a numeric cap on earth stations licensed to use the 28 GHz band. Any such cap would be inherently arbitrary and unnecessary. If earth stations are located in accordance with appropriately defined siting restrictions, there is no reason to limit earth station numbers.

21 Therefore, Telesat reiterates its request that ISED: initiate and lead a study to determine an appropriate coordination trigger; not mandate site shielding; require coordination of new FSS earth stations only where the terrestrial station has been previously licensed, an application has

²¹ TELUS Comments, para. 28.

previously been made to the Department to license the terrestrial stations or where they must be built because of a terrestrial build-out requirement previously imposed by the Department; and confirm that newly licensed earth stations which have completed coordination will not thereafter be subject to additional constraints as a result of future deployment of terrestrial flexible use stations.

F. GEOGRAPHIC RESTRICTIONS ON THE DEPLOYMENT OF FIXED-SATELLITE SERVICES EARTH STATIONS – 28 GHZ

Question 6-5:

A. ISED is seeking comments on whether there should be restrictions on the geographic areas in which new FSS earth stations can be deployed in the 28 GHz band.

B. If geographic restrictions on FSS earth stations are proposed, ISED is inviting detailed proposals on how they could be implemented, and what areas should be targeted.

Determination of appropriate earth station siting rules requires careful study

22 While some geographic restrictions on new earth stations using the 28 GHz band may be appropriate, there is recognition that any such restrictions must be based on informed study of Canadian geography and demographics, the deployment of 5G and appropriate interference level contours, and must respect the objective of supporting both satellite and terrestrial provision of 5G and the extension of service to all Canadians, regardless of their location.²²

23 However, TELUS and Rogers have proposed geographic restrictions that are (in whole or in part) modelled on, and are more restrictive than, those established by the FCC in its initial

²² See for example, Bell Comments, para. 40; RABC Comments, paras. 33-34; BSO Comments, para. 33; Ericsson Comments, p. 16.

Spectrum Frontiers Report and Order.²³ These proposals, like the FCC rules, include unnecessary and imprecise limits on earth station siting that, if applied, would severely restrict and possibly prohibit earth station deployment.

24 As ISED noted in the Consultation Document, the FCC’s approach to limiting deployment of earth stations is not appropriate in Canada, given the deployment of existing gateway earth stations that are near fibre links and close to urban boundaries, and the likely efficiencies arising from using these sites for feeder links in the 28 GHz band.²⁴ Moreover, as RABC and others recognize, terrestrial 5G will not be deployed across terrestrial networks or widely even in many urban and suburban areas.²⁵ Thus blanket prohibitions on earth station deployment in or near Census Metropolitan Areas (“**CMAs**”), Census Areas, or all existing terrestrial networks are unnecessarily prohibitive of satellite deployment. Contrary to Rogers’ suggestion otherwise,²⁶ even in the 28 GHz band, five of the licensed earth stations are located in CMAs based on Annex A of the Consultation Document. Many other licensed earth stations, which as the Consultation Document notes could potentially be used for the efficient provisioning of 28 GHz feeder links consistent with reasonable siting restrictions to protect

²³ Rogers Comments, para. 46; TELUS Comments, paras. 36-40. Since the submission of comments in this process, the FCC has released a draft Second Spectrum Frontiers Report and Order on reconsideration that relaxes some of the geographic restrictions initially established by the FCC.

²⁴ Consultation Document, para. 35.

²⁵ RABC Comments, para. 6.a.; Bell Comments, paras. 13 and 39; Samsung Comments, p. 10.

²⁶ Rogers Comments, para. 47.

terrestrial flexible use, are also located in CMAs, including those operated at Telesat's headquarters in Ottawa.

25 Any restrictions relating to mass transient population areas must also be carefully and clearly defined. They must be sufficiently flexible that they do not bar earth stations that are unlikely to have any material impact on terrestrial 5G deployment, and they must be clearly defined so as to avoid confusion. The use of imprecise terms (e.g. "major event venue" or "major highway or roadway") can only lead to confrontation and difficulties for operators and ISED in the future.

26 Furthermore, the application of a cap on earth stations in a "region" – however that might be defined - is likely to drive perverse and inefficient results, including forcing earth station deployment into more populated areas. If satellite earth station proponents are willing to establish multiple earth stations in less populated areas that satisfy suitable sharing criteria established by ISED, there is no reason to limit earth station numbers.

27 More generally, the diversity of proposals suggested in the comments (many of which suffer from a lack of precision), confirms that careful study led by the Department is required to determine suitable siting restrictions.

G. COEXISTENCE BETWEEN FLEXIBLE USE TERRESTRIAL STATIONS AND SPACE STATIONS IN THE FIXED-SATELLITE SERVICES (EARTH-TO-SPACE) – 28 GHz

Question 6-6: ISED is seeking comments on whether it should impose any limits on the aggregate emissions of the terrestrial services. If limits are proposed, ISED is inviting detailed proposals on why they should be implemented, and what the limits should be.

Aggregate interference to satellite receivers needs to be assessed

28 If aggregate interference to satellite receivers becomes serious, the entire satellite network will be affected and Canadians in remote areas could lose service. Furthermore, should aggregate interference become a problem, virtually nothing can be done short of imposing draconian measures such as turning down terrestrial 5G base stations, freezing terrestrial 5G deployment or turning down satellite links. These are obviously measures no one wants to see. In the circumstances, it is critical to conduct a multilateral study of the potential for aggregate interference to satellite receivers.

29 Unlike in the U.S., FSS is not secondary in the 28 GHz band in Canada. It is also notable that the mobile industry relies on theoretical antenna patterns that, to Telesat's knowledge, have not been implemented to support their assertions that aggregate interference to satellite receivers is unlikely. Moreover, the very factors that terrestrial proponents have identified as making aggregate interference to satellite receivers unlikely, such as use of high gain and down-tilted antennas,²⁷ should make it easy for terrestrial operators to comply with an EIRP mask. A mask would limit interference to satellite orbits and may not involve a reduction in power in the desired direction if more directive antennas are used. In other words, throttling would not be required.

30 Accordingly, Telesat urges the Department to initiate and lead a study to assess appropriate limitations on skyward transmissions from terrestrial base stations that transmit in

²⁷ Bell Comments, para. 42; TELUS Comments, para. 41; Rogers Comments, para. 48; Shaw Comments, para. 50; Samsung Comments, p. 11.

the 28 GHz band to prevent excessive interference to satellite receivers resulting from aggregate terrestrial emissions.

H. TREATMENT OF EXISTING USERS – 28 GHZ

Question 6-7: ISED proposes that all existing FSS earth stations and those in applications pending approval for operation would be permitted to continue to operate under the current conditions of licence as described above. Comments are sought on this proposal.

Existing earth stations and those pending approval should be grandfathered

31 While there is general support for ISED's grandfathering proposal,²⁸ TELUS suggests that the Department should make existing earth station licences conditional on new requirements to protect terrestrial services and that pending applications be assessed for compliance with restrictive new siting conditions.²⁹ These comments ignore the significant investments that have been made in existing satellite infrastructure, and the importance of this infrastructure to achievement of Canada's economic and communications objectives. ISED's grandfathering proposal strikes an appropriate balance in light of these investments and the limited number of earth stations that will qualify for grandfathering.

32 Telesat understands that grandfathering would extend to gateway earth stations associated with satellites and satellite constellations that currently are licensed to use the 28 GHz band. The

²⁸ Bell Comments, para. 45; RABC Comments, para. 42; BSO Comments, para. 37; Intel Comments, p. 8.

²⁹ TELUS Comments, paras. 46 and 49.

RABC has, in fact, proposed an extension of this approach, to include earth stations required for a satellite application that was pending when the Consultation Document was issued.³⁰

33 Furthermore, as Telesat noted in its comments and contrary to TELUS' proposal that any change to an existing earth station should trigger application of new geographic siting restrictions,³¹ modifications to an existing earth station that do not materially affect its PFD contour should not affect the station's grandfathered status. An immaterial change will have no additional impact on terrestrial facilities and therefore should not trigger the application of new geographic siting restrictions.

34 For the reasons discussed above, Telesat reiterates its objection to TELUS' proposal that earth station licensees should be required to publish PFD contours for licensed earth stations.³²

I. CHANGES TO SPECTRUM UTILIZATION POLICIES – 40 GHz

Question 7-1: ISED is seeking comments on the proposal to implement flexible use licensing in the frequency band 37-40 GHz, including the consequential changes to CFTA footnote C51, while continuing to allow for fixed-satellite service (space-to-Earth) in the band.

The comments support consequential changes to the CFTA footnote consistent with continued soft partitioning of the 37-40 GHz band

35 Comments in relation to ISED's proposal to introduce flexible use licensing in the 37-40 GHz band are largely consistent with the views expressed in relation to the introduction of

³⁰ RABC Comments, para. 44.

³¹ TELUS Comments, para. 28.

³² TELUS Comments, para. 47.

flexible use licensing in the 28 GHz band. Accordingly, Telesat’s reply comments in Section D above in response to question 6-1 apply, *mutatis mutandis*, to the 37-40 GHz band. As stated in its initial comments, Telesat suggests that the words “large” and “feeder links” be removed from footnote C51.

J. BAND SHARING WITH OTHER SERVICES – 40 GHZ

Question 7-4:

A. ISED seeks comments on the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and FSS earth stations in the frequency band 37.5-40 GHz when a pre-determined trigger threshold is exceeded.

B. If site-by-site coordination is proposed, what coordination trigger and value would be the most appropriate (e.g. PFD or distance threshold)?

C. ISED is also inviting proposals for specific additional technical rules on flexible use stations and FSS earth stations (e.g. site shielding) that could facilitate more efficient sharing between terrestrial and earth stations.

The comments support site-by-site coordination based on a trigger to be determined through further study

36 As for the 28 GHz band, there is general support for site-by-site coordination³³ based on a coordination trigger,³⁴ to be determined through further study.³⁵ Earth stations must also be protected from interference through coordination and protection zones. In particular, licensed

³³ BSO Comments, para. 46; RABC Comments, para. 50; GSA Comments, p. 6; TELUS Comments, para. 59; Rogers Comments, para. 63; Samsung Comments, p. 16; Viasat Comments, p.8; Ericsson Comments, p. 19; SaskTel Comments, para. 64; Xplornet Comments, p.7; Intel Comments, p. 8; BCBA Comments, para. 36.

³⁴ RABC Comments, para. 51; Bell Comments, para. 58; SaskTel Comments, para. 65; TELUS Comments, para. 59; Rogers Comments, para. 64; GSA Comments, p. 6; Ericsson Comments, p. 19; Samsung Comments, p. 16; Xplornet Comments, p. 7.

³⁵ Bell Comments, para. 59; RABC Comments, para. 52; BSO Comments, para. 48; Rogers Comments, para. 65; SaskTel Comments, para. 66.

earth stations must be protected from interference by future terrestrial stations within a protection zone. Without this protection, satellite use will be effectively barred in the 37-40 GHz band.

37 As indicated at the outset of these reply comments, access to 28 and 37-40 GHz spectrum is required for satellite provision of broadband and 5G services. Satellite providers do not have access to other bandwidth that will support delivery of these services using current technologies.³⁶ For these reasons, Telesat urges the Department to disregard TELUS' proposition that satellite providers can use other spectrum,³⁷ as well as Bell's position that FSS should effectively have secondary status in the band.³⁸ TELUS' further proposition that satellite operators should bid on 37-40 GHz auction spectrum if they wish more flexibility in locating earth stations is also unpalatable³⁹; satellite operators do not require an area licence to support a gateway earth station. Moreover, the grant of such a licence to a satellite operator would preclude terrestrial flexible use in that area.

38 An appropriate framework for coexistence of satellite and flexible use services in the 37-40 GHz band is therefore essential. Furthermore, under this framework, every licensed earth station in the 37-40 GHz band that complies with applicable siting restrictions should be entitled

³⁶ TELUS asserts baldly that satellite services have access to 25 times more spectrum than terrestrial carriers. This assertion appears to be based on a simple addition of spectrum allocations – an approach that was proposed and refuted in proceedings before the FCC. It ignores the fact that some spectrum that is allocated to FSS is severely restricted (e.g. by footnotes C20, C3, C49) or is beyond current technological capability (e.g. 71-76GHz and 81-86 GHz). (TELUS Comments, para. 4)

³⁷ TELUS Comments, para. 65.

³⁸ Bell Comments, para. 55.

³⁹ TELUS Comments, para. 65.

to protection. In this regard, TELUS' suggestions that coordination would apply only to the consideration of new deployments of FSS earth stations in "proximity" to existing flexible earth stations, and that coordination would be limited to flexible use stations in "proximity" to an earth station protection zone, are unacceptable.⁴⁰ Once an acceptable interfering PFD is mutually agreed or established, a terrestrial licensee will need to accept base station siting restrictions consistent with this limit and engage in coordination to protect all licensed earth stations within their protection zones.

39 As previously indicated, the determination of an appropriate coordination trigger is a matter that requires study initiated and led by ISED. As discussed above, 3GPP studies should not be accepted *a priori* in the establishment of coexistence requirements for FSS and flexible use terrestrial stations. Rather, and as proponents of 3GPP studies such as Bell appear to agree, a multilateral study to determine an appropriate coordination trigger is necessary.⁴¹

⁴⁰ TELUS Comments, paras. 60 and 64.

⁴¹ See footnote 17 above. For the same reasons as discussed above in response to 6-4, Telesat also opposes TELUS' repeated request for publication of earth station contours. (TELUS Comments, para. 61)

K. GEOGRAPHIC RESTRICTIONS ON THE DEPLOYMENT OF EARTH STATIONS – 40 GHz

Question 7-5:

A. ISED is seeking comments on whether there should be restrictions on the geographic areas in which new FSS earth stations can be deployed in the frequency band 37.5-40 GHz.

B. If geographic restrictions on FSS earth stations are proposed, ISED is inviting detailed proposals on how they could be implemented, and what areas should be targeted?

Determination of appropriate earth station siting rules requires careful study

40 For the reasons discussed above in section F in response to question 6-5, FCC or FCC-like restrictions, the geographic restrictions proposed by Rogers and TELUS⁴², and Bell’s proposition that new FSS earth stations in the 37-40 GHz band should be restricted to “rural” areas⁴³, will unnecessarily limit FSS deployment. Rather, any geographic restrictions on earth stations should be based on a multilateral study initiated and led by ISED, which takes into account Canadian geography, demographics and telecommunications needs.⁴⁴

L. LICENCE-EXEMPT USE – 28 GHz AND 40 GHz

Question 9-1: ISED is seeking comments on:

A. Whether flexible use access in these bands should be exclusively licenced or licence-exempt.

B. If a licencing approach is proposed, which types of licences (radio licences, spectrum licences with user-defined licence areas, spectrum licences with service areas for competitive licensing, or others) are expected to best lend themselves to licensing flexible use in the 28 GHz and 37- 40

⁴² Rogers Comments, para. 72; TELUS Comments, para. 66.

⁴³ Bell Comments, para. 61.

⁴⁴ See also Ericsson Comments, at p. 20, where Ericsson “supports RABC’s recommendation to form a technical group to develop an acceptable approach to geographically limit FSS earth station deployments, that will sufficiently protect flexible use terrestrial stations without excessively impeding the deployment of FSS stations.”

GHz frequency bands in order to support a variety of 5G technologies, applications and business cases?

C. Whether a licence-exempt dynamic access using data base should be implemented in all, or portions of the 28 GHz, 37-40 GHz, particularly in the band 37-37.6 GHz.

The majority of comments oppose licence-exempt dynamic access in the 28 and 37-40 GHz bands

41 Telesat notes that there is broad support for exclusive licensing of the 28 and 37-40 GHz bands and opposition to implementation of licence-exempt dynamic access to the 28 and 37-40 GHz bands, given its cost and complexity.

III. CONCLUSION

42 In view of the foregoing and consistent with its initial comments, Telesat submits that the Department should:

1. develop a regulatory policy that promotes the rollout of innovative wireless infrastructure, and does not prevent the efficient deployment and operation of satellite facilities that will complement terrestrial flexible use;
2. ensure that the policy reflects Canada's unique geography and demographics, and aligns with the Department's goal of making innovative telecommunications services available to all Canadians, including satellite-dependent communities in rural Canada and the North, and not uncritically adopt the FCC's decisions in its Spectrum Frontiers Report and Order or other blanket earth station siting restrictions;

3. require licensed, rather than licence-exempt, use for the 28 GHz and 37-40 GHz bands and, in particular, not adopt licence-exempt dynamic access using a database in the 28 GHz or 37-40 GHz bands;
4. grandfather already-licensed FSS earth stations and those for which applications were received prior to the release of the Consultation Document, so that they are not subject to any additional constraints due to the deployment of terrestrial flexible use stations in the vicinity;
5. license future earth stations on a case-by-case basis, considering their unique circumstances and characteristics;
6. not mandate site shielding for all earth stations, when other coordination measures may be less restrictive and more effective;
7. require coordination of new FSS earth stations with flexible use terrestrial stations only where the terrestrial station has been previously licensed, an application has previously been made to the Department to licence the terrestrial stations or where they must be built because of a terrestrial build-out requirement previously imposed by the Department;
8. ensure that newly licensed FSS earth stations which have completed such coordination will not thereafter be subject to any additional constraints as a result of future deployment of terrestrial flexible use stations in the vicinity; and
9. initiate and lead a technical study (or studies) to determine:
 - a. appropriate trigger mechanisms for coordination in the 28 GHz and 37.5 – 40 GHz bands, to facilitate the determination of compatibility between FSS earth stations and terrestrial 5G without performing unnecessary calculations;

- b. appropriate restrictions on the geographic areas in which an earth station that transmits in the 28 GHz band or receives in the 37.5-40 GHz band may be located, taking into account Canadian geography, demographics and telecommunications needs;
- c. appropriate limits on skyward transmissions from terrestrial base stations that transmit in the 28 GHz band to prevent excessive interference into satellite receivers resulting from aggregate terrestrial emissions.

All of which is respectfully submitted on behalf of TELESAT CANADA

/s/ _____
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