

SaskTel Comments:

Gazette Notice SLPB-001-17

Consultation on Releasing Millimetre
Wave Spectrum to Support 5G

September 15, 2017

EXECUTIVE SUMMARY

1. The following is a summary of SaskTel's submission in response to Gazette Notice SLPB-001-17 *Consultation on Releasing Millimetre Wave Spectrum to Support 5G* ("the Consultation").
2. SaskTel participated in the Radio Advisory Board of Canada (RABC) working group responsible for creation of the RABC response to the Consultation. SaskTel supports the RABC submission. SaskTel's comments are meant to provide additional clarity on our positions where appropriate, and provide further input on issues that were not addressed in the RABC response.
3. SaskTel believes that this consultation is timely, and that it is appropriate for the Department to move ahead with the development of policies, licensing models, and band plans for the 28 GHz, 37-40 GHz, and 64-71 GHz bands. Although 5G standardization work is still ongoing at 3GPP, and ITU decisions on these bands are expected at the WRC-19 conference in 2019, the benefits of proceeding forward now with this consultation outweigh the risks of any unexpected outcome from 3GPP and ITU decisions.
4. In response to the question from the Department requesting input on any necessary policy or regulatory considerations by ISED, SaskTel stresses the need for flexibility in their policies and regulations regarding upcoming 5G technologies and system deployments. SaskTel believes the objectives as stated by the Department in the Consultation are correct. It is prudent for the Department to apply the most appropriate regulation for each case, and offer flexible policies and regulations to cover as much as possible all scenarios.
5. For example, there will be differences between urban and rural deployments. Tier 4 based spectrum licences offered through an auction process would be most appropriate for urban areas due to the expected high demand. However outside of urban areas grid-cell based spectrum licences offered on a first-come first-served (FCFS) basis would be far more appropriate. This would support innovation and allow rural residents in smaller communities to benefit from 5G system deployments.

6. SaskTel agrees with the proposed use of a flexible use licensing model in the 28 GHz and 37-40 GHz frequency bands, allowing both fixed and mobile services to be deployed.
7. SaskTel agrees with the proposal to designate the 64-71 GHz band for licence exempt use, in harmonization with the FCC. The licence exempt environment will promote innovation and allow new devices and services to be developed and deployed. Canadians will also benefit from the economies of scale that will be achieved from the large American device ecosystem.
8. We agree with the proposed band plans for the 28 and 37-40 GHz bands, noting that they are harmonized with the FCC band plans.
9. SaskTel agrees with the proposed moratorium on new site-specific licences in the 28 GHz band.
10. Coexistence issues were raised in the Consultation between proposed new flexible use fixed and mobile systems and fixed satellite systems (FSS) in both the 28 and 37-40 GHz bands. Questions were raised regarding coordination procedures and triggers, as well as proposed geographic restrictions on FSS earth stations. SaskTel notes that an RABC technical working group will be discussing in detail coexistence issues between new flexible use fixed and mobile systems and FSS earth stations, including determination of PFD trigger values and manageable geographic restrictions. SaskTel recommends that the Department use the results and recommendations of the RABC technical working as guidance in their decisions.
11. The RABC technical working group will also be studying if limits need to be imposed on aggregate emissions from terrestrial stations in the 28 GHz band. SaskTel recommends that the Department use the results of the RABC study to guide their decisions on aggregate emission limits.
12. The Department also posed a number of questions regarding the treatment of existing 38 GHz licensees, noting that this band is heavily deployed in the same major urban centres where new 5G systems are expected to be deployed first. Because of the large number of deployments, 5G deployment in 38 GHz and transition of this band will be complex. A moratorium is inevitable on 38 GHz point to point systems licenced under the FCFS grid cell and site-specific licenses, as well as those licenced

under Tier 3 spectrum licences. SaskTel does not see a need for an immediate moratorium, but a moratorium will very likely be required at the time final decisions are made by the Department on licensing this band.

13. Due to the investments made by Tier 3 spectrum licence holders, SaskTel believes it would be appropriate for existing Tier 3 fixed spectrum licences in the 38 GHz band to be converted to Tier 4 based flexible use (fixed and mobile) spectrum licences only in Tier 4 areas where the licence holder has actually deployed systems. Because the flexible use fixed and mobile spectrum licences are more valuable than fixed licences, SaskTel proposes that the bandwidth of the new Tier 4 based flexible use spectrum licences be reduced to 60% of the bandwidth of the fixed licences. For example, a 50 MHz fixed spectrum licence would be converted to a 30 MHz wide flexible use fixed and mobile spectrum licence.
14. With regards to incumbent 38 GHz licensees and existing deployments, SaskTel notes the high level of deployment in this band in major urban centres. These links are heavily used for cell site backhaul, amongst other services. We believe that these systems must be protected from interference because of the impact of any potential disruption of services if these systems were not protected from 5G flexible use fixed and mobile systems. Therefore, SaskTel recommends that the existing FCFS licensees in the 38 GHz band be allowed to continue to operate and be protected from interference, as per paragraph 67 of the Consultation.
15. SaskTel is recommending that exclusive licensing be used in the 28 GHz and 37-40 GHz frequency bands, and that a competitive spectrum auction process be used because of the expected high demand for the licences in urban areas. Tier 4 based spectrum licences would be most appropriate for the spectrum auction process in urban areas.
16. However, SaskTel sees low demand for this spectrum in rural areas. The low demand and the very limited range possible with mmWave spectrum makes Tier 4 based spectrum licensing inappropriate for rural based service areas, i.e. in Tier 4 service areas without an urban population centre.
17. SaskTel recommends that the Department offer grid-cell based spectrum licences for smaller population centres in rural areas on a first-come first-served basis (FCFS). This could easily be done after the initial spectrum auction is completed. This would

allow operators to acquire small grid-cell spectrum licences to serve smaller communities and other small population clusters in rural areas, and support innovation in serving all Canadians with 5G services.

18. SaskTel believes that longer licence terms, up to 20 years, would be appropriate for the flexible use fixed and mobile spectrum licences offered through this licensing process.
19. Finally, SaskTel recommends that a spectrum auction process be used with rules that create a level playing field for all bidders in order to allow market forces to be relied upon per ISED policy objectives. The wireless market in Saskatchewan has four facilities-based carriers, and is very competitive. The evidence of this is that Saskatchewan has some of the lowest consumer wireless prices in the country. Introduction of a fifth carrier in this market would be harmful to the market and very detrimental to consumers.
20. It would be counter-productive to introduce artificial measures such as spectrum aggregation limits or spectrum set-asides in this auction. The Department has stated that the mmWave spectrum is complementary to low band spectrum, and SaskTel believes that it is not viable for a carrier to deploy mmWave spectrum without access to low band spectrum to offer the wide area coverage demanded by subscribers today. Therefore, SaskTel suggests that the auction rules be structured so that the spectrum will be utilized by the wireless operators in the best position to actually deploy the spectrum. This can best be accomplished by using an auction process with a level playing field for all bidders, and rules that rely on market forces alone, rather than artificial measures such as arbitrary spectrum aggregation limits or set-aside measures.

INTRODUCTION

21. Saskatchewan Telecommunications (“SaskTel” or “the Company”) is pleased to provide this response to Gazette Notice SLPB-001-17 *Consultation Releasing Millimetre Wave Spectrum to Support 5G* (“the Consultation”).
22. SaskTel participated in the Radio Advisory Board of Canada (RABC) working group responsible for creation of the RABC response to the Consultation. SaskTel supports the RABC submission. SaskTel’s comments below are meant to provide additional clarity on our positions where appropriate, and provide further input on issues that were not addressed in the RABC response.
23. SaskTel’s detailed responses to the questions posed in the Consultation are below. The section numbering of this document corresponds to the section numbering of the Consultation. Failure to address any particular issue or item, or the Comments made by any other party, should not be construed as agreement with those Comments where such agreement is not in the interests of SaskTel.

SASKTEL RESPONSE TO THE CONSULTATION ON RELEASING MILLIMETRE WAVE SPECTRUM TO SUPPORT 5G

3. *Policy objectives*

4. *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.

24. As stated in the Consultation, the Department’s objectives¹ include:

ISED is committed to ensuring that Canadian consumers, businesses and public institutions continue to benefit from the latest wireless telecommunications services across the country.

and

¹ Consultation, section 3, paragraphs 3, 5.

the objective of the spectrum program is to maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum resource.

25. SaskTel agrees with these objectives.

26. The development of 5G technologies promises advanced networks that will provide far higher data bandwidths more efficiently and effectively. 5G networks will allow for the delivery of new and enhanced services to consumers. As per paragraph 8 of the Consultation:

Forecasted use cases include enhanced/ultra-fast mobile broadband, massive machine type communications, and ultra-reliable/low latency communications, all of which are predicted to drive increased usage and facilitate deployment of integrated verticals such as healthcare, transportation, and smart cities, while leveraging massive Internet-of-Things (IoT) growth.

27. SaskTel also agrees with the Department's assessment² that:

Spectrum is a crucial resource for wireless carriers.

A more flexible and effective use of mmWave spectrum has the potential to facilitate the development and adoption of 5G technology.

28. The development of 3GPP standards for 5G is still ongoing, in parallel with vendor equipment development and trials. Although the general direction of this research and development work is established, there is still uncertainty in exactly how and when 5G technology will be deployed, what business models will be leveraged, and what network applications will be provided.

29. SaskTel would suggest to the Department that the potentially disruptive nature of the deployment of new 5G technologies will require flexibility in the policies and regulations of the Department. It will also become more important that the Department consider all of the different scenarios when it comes to urban versus rural population densities and topographies, low band spectrum versus new high band spectrum, different and evolving ecosystems, new network architectures, and new applications and services still being conceived and developed.

² Consultation, paragraphs 4 and 8.

30. For example, different and flexible licensing models will be required to best accommodate both new small cell architectures in densely populated urban areas and potential deployments of fixed 5G services in smaller communities and rural areas. “One size” will not “fit all”. In this example, Tier 4 based spectrum licences would work best for providers in urban areas, while smaller FCFS grid-cell based licences would be more appropriate for smaller centres and rural areas.
31. SaskTel would suggest that the Department can best encourage innovation and development of 5G technologies by being as flexible as possible in applying regulatory measures, including using the most appropriate licensing models.
32. At this time, SaskTel has no other specific input or recommendations on business models or network applications that require policy and regulatory consideration from ISED.

5. *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.

33. SaskTel agrees with the proposal by the Department to adopt a flexible use licensing model in the 28 GHz and 37-40 GHz bands. This flexible use licensing model would allow licensees to deploy fixed systems, mobile systems, or a combination of fixed and mobile systems as they see fit. It is foreseen that deployments in these bands will be ubiquitous in nature in urban areas, with the possibility of deployments in smaller population clusters in rural areas. SaskTel recommends that these deployments be licensed using spectrum licences covering a defined service area, as opposed to site-by-site licensing.
34. 5G technology trials are still ongoing in parallel with work on establishing industry standards. Potential use cases and business models are still being developed. Initially it was suggested that the primary focus of 5G would be mobile services, but lately there has been an increasing focus on the potential for 5G to provide fixed services to customers in a small-cell type architecture.

35. SaskTel agrees with the Department in their goal of supporting and promoting innovation in the wireless industry, and believes that the adoption of a flexible use licensing model would be the best approach to accomplish this for the development and deployment of 5G systems in the 28 GHz and 37-40 GHz bands.
36. SaskTel also agrees with the proposal to allow licence exempt use of the 64-71 GHz frequency band, which harmonizes with the FCC rules for this spectrum. We agree with the Department's assessment that there is strong interest in this band for licence exempt wireless devices, and that this interest will grow.
37. As noted in the consultation, 5G 3GPP standards have not been finalized, and the ITU will not complete their studies and finalize allocations for the 37-40 GHz and 64-71 GHz bands until the completion of the WRC-19 conference. However, the FCC is proceeding forward with allocation and licensing decisions in all three bands being considered in this consultation. Because of the importance of harmonizing with the FCC band plan, and despite the risk of proceeding ahead of the finalization of 5G related work at the ITU and 3GPP, SaskTel recommends the Department proceed forward with the proposed licensing models for the three bands as proposed in the consultation.

6. 28 GHz frequency band (27.5-28.35 GHz)

6.2 Changes to spectrum utilization policies

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 CTFA domestic footnotes and the policy on this band contained in SP 3-30 GHz, Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation.

38. SaskTel agrees with the changes as proposed by the Department in the consultation to introduce flexible use licensing in the 28 GHz band, including consequential changes to Canadian Table of Frequency Allocations (CTFA) footnotes C47A and new footnote C47C, as well as changes to the policy on this band contained in ISED document SP 3-30 GHz "Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range and Further Consultation".
39. SaskTel also agrees with the Department that soft partitioning will continue to be an effective approach to sharing spectrum in this band which will facilitate the

deployment of earth stations while ensuring that minimal constraints are imposed on the future deployment of fixed and mobile services.

40. We support the comments of the RABC regarding CTFA footnotes C47A and C47C, including the request for clarification of the use of the term “large” and the text changes to the footnotes proposed by the RABC.

6.3 *Moratorium*

Question 6-2: ISED is seeking comments on the moratorium for new site-specific fixed service licences as described above.

41. SaskTel agrees with the proposal to impose a moratorium on new site-specific fixed service licences in the 28 GHz band as described in the consultation.

6.4 *Changes to band plan*

Question 6-3: ISED is seeking comments on its proposal to adopt the band plan (as shown in figure 3 in the Consultation) in the 28 GHz band.

42. SaskTel agrees with the proposal to adopt the band plan as shown in Figure 3 of the consultation, harmonizing with the FCC band plan.

6.5 *Changes to band plan*

6.5.1 *Coexistence between flexible use terrestrial stations and earth stations in the fixed-satellite service (Earth-to-space)*

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.

43. SaskTel supports the RABC comments on this question.
44. SaskTel agrees with the proposal to require site-by-site coordination between proposed flexible use terrestrial stations and Fixed Satellite Service (FSS) earth stations in the 28 GHz band based on the exceeding of a pre-determined trigger threshold. As per the proposed CTFA footnote C47C, the number of earth stations is

expected to be small, therefore this site-by-site coordination process should be manageable.

Question 6-4:

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

45. SaskTel supports the RABC comments on this question.

46. In their working group discussions, the RABC has determined that a PFD trigger mechanism would be most appropriate to initiate a site-by-site coordination process.

47. The RABC will be forming a working group to study in more detail coexistence and coordination procedures for terrestrial and FSS earth stations in the 28 GHz and 37-40 GHz bands. It is expected that this study will result in a recommendation of a PFD trigger value for coordination.

Question 6-4:

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.

48. SaskTel supports the RABC comments on this question

6.5.2 Geographic restrictions on the deployment of fixed-satellite services earth stations

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.

49. SaskTel notes the intention of the Department to continue the soft partitioning approach to sharing spectrum between terrestrial and FSS earth stations in the 28 GHz band, and the proposed new CFTA footnote C47C that would limit FSS deployments to ensure minimal constraints are imposed on the deployment of fixed and mobile systems. SaskTel would also note the view of the Department as stated in the Consultation that the FCC approach for limiting the areas in which FSS stations

can be deployed is not appropriate in the Canadian context.³ SaskTel agrees with that assessment.

50. Although the FCC approach is too restrictive, SaskTel does believe that geographic restrictions on the deployment of 28 GHz FSS earth stations will be required. It is anticipated that the restrictions could be applied during the licensing process for each individual FSS earth station. However, at this time it is not possible to define appropriate restrictions that will properly balance the needs of both terrestrial operators and 28 GHz FSS operators. This issue will be studied by the RABC technical working group looking into 28 GHz and 37-40 GHz coexistence issues.

51. Once the RABC technical working group completes their study of the coexistence issues, SaskTel would recommend that the Department look to the recommendations of the RABC working group for guidance on geographic restrictions for the 28 GHz band FSS earth stations.

Question 6-5:

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.

52. SaskTel supports the RABC comments on this question

53. As noted above, the RABC will be forming a technical working group to study the issues surrounding 28 and 37-40 GHz coexistence. SaskTel recommends that the Department follow the recommendations of the RABC technical working group regarding proposed geographic restrictions on 28 GHz FSS earth stations.

6.5.3 Coexistence between flexible use terrestrial stations and space stations in the fixed-satellite services (Earth-to-space)

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.

³ Consultation, section 6.5.2, paragraph 35

54. SaskTel supports the RABC comments on this question. We agree with the RABC in that any interfering transmissions towards space stations in the 28 GHz band from terrestrial fixed and mobile systems will be inherently limited because of the expected requirement to use dynamic beam forming and very narrow beam widths. The use of dynamic beam forming and massive MIMO techniques by 5G fixed and mobile systems will be essential to overcome the propagation challenges of the mmWave spectrum bands. In addition, it could be problematic to impose aggregate emission limits where there are multiple service providers involved.

55. However, SaskTel also agrees that further studies should be conducted on aggregate emissions from terrestrial stations. The RABC technical working group will be studying this issue, and SaskTel suggests the Department use the results from the RABC working group study for guidance on this question.

6.6 Treatment of existing users

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.

56. SaskTel supports the RABC comments on this question.

57. We believe that existing FSS earth stations, i.e. operating stations as well as those with pending applications as defined by the Department, should be permitted to continue to operate under their current conditions of licence. Siting of earth stations with pending applications but not yet constructed should take into consideration the intent of the Department to pose minimal constraints on the deployment of fixed and mobile systems.

7. Frequency band 37-40 GHz

7.2 Changes to spectrum utilization policies

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 CTFA footnote C51, while continuing to allow for fixed-satellite service (space-to-Earth) in the band.

58. SaskTel supports the proposal to implement flexible use licensing in the 37-40 GHz frequency band, including consequential changes to CTFA footnote C51, while continuing to allow for FSS service (space to earth) in the band.

59. SaskTel also supports the RABC comments requesting changes to the proposed text for footnote C51, and for clarification of the use of the term “large” in the footnote.

Question 7-2: ISED is seeking comments on whether a moratorium on the issuance of new licences under the New Licensing Framework for the 24, 28 and 38 GHz Bands and Decision on a Licence Renewal Process for the 24 and 38 GHz Bands is required at this time.

60. As noted by the Department in the Consultation, the 38.4-40 GHz band is widely deployed in urban centres, and quite heavily deployed in the larger urban centres of Vancouver, Calgary, Edmonton, Toronto, Ottawa, and Montreal. This will make it very complex to deploy future flexible fixed and mobile services (5G) in these same cities with a heavy concentration of fixed point to point systems in the same band.

61. SaskTel believes that a moratorium on the issue of new licences in this band is inevitable, and will be required to allow for the implementation of 5G flexible fixed and mobile services, once final decisions have been made on the overall licensing process and the timing and transition process has been determined.

62. However, SaskTel does not see a need for an immediate moratorium. We believe that the moratorium can wait until the licensing process has been finalized. This could provide time for existing 38 GHz licensees to prepare for the moratorium and possible band transitions. Any additional point to point links added in the interim period prior to the release of final decisions on the licensing process will not significantly add to the complexity of a 38 GHz band transition.

7.3 Changes to band plan

Question 7-3: ISED is seeking comments on the proposal to adopt the band plan as shown in figure 7 for the frequency band 37-40 GHz.

63. SaskTel agrees with the proposal to adopt the band plan for the 37-40 GHz band as shown in Figure 7 of the Consultation in harmonization with the FCC band plan.

7.4 Band sharing with other services

7.4.1 Coexistence between flexible use terrestrial stations and earth stations in the fixed-satellite service (space-to-Earth)

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.

64. SaskTel supports the RABC comments on this question. We agree with 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 based on exceeding a PFD based trigger. We believe this process would be manageable.

Question 7-4:

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

65. SaskTel supports the RABC comments on this question. We agree with the RABC that a PFD based trigger mechanism would be most appropriate to initiate the site-by-site coordination process. The RABC will be forming a technical working group to study this question in detail, and SaskTel suggests that the Department use the recommendations from the RABC working group for guidance.

Question 7-4:

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.

66. SaskTel supports the RABC comments on this question.

7.4.2 Geographic restrictions on the deployment of earth stations

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.

67. SaskTel supports the RABC comments on this question. The RABC technical working group will be studying this question in detail, and SaskTel suggests that the Department use the results and recommendations of this study as guidance.

Question 7-5:

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?

68. SaskTel supports the RABC comments on this question. The RABC technical working group will be studying this question in detail, and SaskTel suggests that the Department use the results and recommendations of this study as guidance.

7.4.3 Band sharing with the space research service (SRS) (space-to-Earth) and mobile-satellite service (MSS) (space-to-Earth)

Question 7-6: It is proposed that, should SRS and/or MSS systems be deployed, flexible use licensees in the band 37.6-40 GHz may be subject to technical provisions to facilitate co-existence. Comments are sought. ISED notes that any such technical provisions would be established through a future consultation process.

69. SaskTel agrees with the Department's proposal to potentially impose technical provisions or restrictions to protect any future SRS or MSS implementations in Canada, in the event that an SRS or MSS service deployment occurs. SaskTel understands that any required technical restrictions or licence conditions will be the subject of a future consultation.

7.5 Treatment of existing users

Question 7-7:

A. ISED is seeking comments on the options and implications for the treatment of incumbent licensees currently holding Tier 3 licences, the percentage that would apply to option 1 and supporting rationale.

70. SaskTel notes the widespread deployment of systems by Tier 3 fixed spectrum licence holders in the 38 GHz band. Because of the heavy investment made by the licence holders, SaskTel believes that Option 1 would be most appropriate for existing Tier 3 licence holders, as described in paragraph 64 of the Consultation, with some modifications.

71. SaskTel agrees with the proposed use of Tier 4 spectrum licences, as described in our response to Question 9-1 B. Therefore, SaskTel suggests that existing Tier 3 fixed spectrum licences in the 38 GHz band be converted to Tier 4 based flexible use spectrum licences, where systems have actively been deployed, and with a reduction in spectrum to 60% of the original spectrum holdings. For example, a 50 MHz wide fixed spectrum licence would become a 30 MHz wide flexible use spectrum licence. SaskTel believes that the 40% reduction in spectrum holdings is reasonable considering the higher value of the flexible fixed and mobile use licences.

72. SaskTel does not believe that a Tier 3 based fixed spectrum licence should be converted to a Tier 4 based flexible use spectrum licence in a Tier 4 service area where the operator has not deployed.

Question 7-7:

B. ISED is seeking comments on the options and implications for the treatment of incumbent licensees currently holding FCFS licences and supporting rationale.

73. SaskTel notes the large number of deployments of 38 GHz point to point systems by incumbent FCFS site-specific and grid-cell based licence holders. These deployments represent a significant investment by network operators, and provide key backhaul capabilities to large portions of multiple mobile wireless networks. SaskTel believes it would be too disruptive to the wireless industry to require their replacement, even after a one year notification period, upon deployment of 5G systems in the same area.

74. Therefore, SaskTel recommends that existing FCFS licensees in the 38 GHz band be allowed to continue to operate and to be protected from interference from new flexible use licensees, as described in paragraph 67 of the Consultation.

75. It is expected that wireless operators will coordinate and negotiate agreements with incumbent FCFS licence holders allowing the deployment of new 5G flexible fixed and mobile systems in the 38 GHz band. However, having a protected status will provide some certainty for the FCFS fixed operator, while not precluding any arrangements they may make with the flexible use licence holder for the displacement of 38 GHz point to point fixed systems.

8. Frequency band 64-71 GHz for licence-exempt use

8.2 Changes to spectrum utilization policies

Question 8-1: ISED is seeking comments on its proposal to designate the band 64-71 GHz for licence-exempt operations on a no-protection, no-interference basis.

76. SaskTel agrees with the Department’s proposal to designate the band 64-71 GHz for licence exempt operations on a no protection, no interference basis. This allows harmonization with the FCC in this spectrum band, which will allow Canadians to benefit from the economies of scale of the larger US device ecosystem.

9. General spectrum access considerations for terrestrial services in the 28 GHz and 37-40 GHz frequency bands

Question 9-1:

A. ISED is seeking comments on whether flexible use access in these bands should be exclusively licenced or licence-exempt.

77. SaskTel supports the comments of RABC in response to this question. We agree that flexible use access in the 28 GHz and 37-40 GHz frequency bands should be exclusively licenced.

Question 9-1:

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

78. SaskTel recommends that the Department utilize spectrum licences with service areas for competitive licensing for the initial spectrum auction licensing process.

79. It is expected that there will be high demand for the 28 GHz and 37-40 GHz frequency bands to deploy 5G mmWave flexible use systems in urban areas. Therefore, SaskTel would recommend a spectrum auction process be used. In the case of an auction for mmWave spectrum in urban areas, Tier 4 based service areas would be most appropriate.

80. It is quite clear that the main focus for deployment of mmWave spectrum will be urban areas, and it is expected that there will be almost no demand for this spectrum in the

Tier 4 based service areas without any urban sized population centres, i.e. rural based Tier 4 areas.

81. SaskTel does believe however there may be some opportunities for 5G deployments in smaller communities and other small population clusters in rural areas.

82. SaskTel would therefore suggest that, after the initial auction of the 28 GHz and 37-40 GHz frequency bands is completed, that the Department offer spectrum licences in these bands in the remaining areas on a First-Come First-Served (FCFS) basis with user defined service areas based on grid cells. This would allow operators the opportunity to acquire grid-cell based spectrum licences to serve smaller communities and small population clusters in rural areas, and support innovative ways to serve all Canadians with 5G based services, including rural residents.

83. SaskTel does not believe the use of site-specific licensing would be appropriate for these bands, considering that ubiquitous deployments are anticipated.

Question 9-1:

C. ISED is seeking comments on 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.

84. SaskTel supports the comments of RABC in response to this question.

9.3 *Licensing policy considerations (if exclusive licencing is implemented)*

Question 9-2: If an exclusive licensing approach is implemented, preliminary comments are sought on the benefits and risks related to longer licence terms for these frequency bands.

85. SaskTel agrees with the Department's assessment that the benefits of a longer licence term will outweigh the risks and current uncertainty with these frequency bands. Although the 5G standards have not been finalized, the direction being taken in the standardization process is fairly clear as of this writing. SaskTel does not believe that there is a high risk of the technology developing in an unforeseen manner. Although the ITU WRC-19 conference is two years away, significant changes to the band allocations are also not anticipated.

86. We therefore agree that longer licence terms, up to 20 years, would be appropriate for licences issued in a competitive licensing process in these frequency bands.

87. SaskTel notes the possibility highlighted by the Department in the Consultation that opportunistic spectrum access mechanisms may be developed in the future, and may be required to be implemented by licence holders in these frequency bands. SaskTel would recommend that a full and thorough public consultation be conducted prior to the introduction of any licence conditions to allow opportunistic spectrum access. SaskTel does recognize that spectrum sharing and efficient use of spectrum will become more critical in the future, but SaskTel cautions the Department that careful consideration must be given to the impacts of these licence conditions on existing networks, including impacts to customer experience and network investments.

9.4 Measures to support competition (if exclusive licencing is implemented)

Question 9-3: If an exclusive licensing approach is proposed, ISED is seeking preliminary comments on possible measures that could support competition in light of the current conditions in the Canadian wireless service market and anticipated development and deployment of 5G services if flexible use licensing is developed through a spectrum licensing model.

88. The goals of the Department as stated in the Consultation are to “ensure that the maximum social and economic benefits are derived from the use of the radio frequency spectrum of the mmWave bands”.⁴ SaskTel agrees with these objectives.

89. Licence transferability and divisibility is a crucial mechanism allowing the secondary spectrum market to increase the overall efficiency of the market place. The ability to transfer licences in whole or in part via commercial agreements between wireless operators enhances competition in the market place.

90. The wireless market in Saskatchewan is already highly competitive. SaskTel aggressively competes against three other facilities-based carriers. The presence of four carriers in the Saskatchewan market has directly resulted in some of the lowest consumer prices for wireless services in the country. The presence of a fourth player

⁴ The Consultation, section 9.4, paragraph 96.

in the market greatly increases overall competitiveness, as it does everywhere else in the country where a fourth player is competing.

91. In this competitive market SaskTel does not believe the right approach is to use artificial measures to distort the marketplace and attempt to attract a fifth player as a new entrant. In fact, many of the “small” players being encouraged by the Department through artificial subsidies are actually well financed and well established wireless operators.
92. The Saskatchewan market place is highly competitive, and SaskTel believes that market forces need to be relied upon to the greatest extent feasible, a key enabling guideline of ISED’s “Spectrum Policy Framework for Canada”.
93. The only method whereby market forces can be truly allowed to operate freely is through the use of an open and transparent auction process, with a level playing field for all bidders. SaskTel does not believe spectrum aggregation limits or set-aside mechanisms are necessary or even appropriate in a competitive marketplace with four strong players. Imposing such measures in the mmWave spectrum auction would artificially distort the market and would be detrimental to consumers.
94. The Department also states the following in paragraph 105 of the Consultation:

ISED recognizes that mmWave technology is at a nascent stage of development. It also recognizes, as noted by the FCC, that given their technical characteristics, these bands will likely be used to complement existing lower-band spectrum currently used for the provision of mobile wireless services.
95. SaskTel strongly agrees with these statements. In fact, due to the extreme propagation challenges and therefore very limited range of mmWave spectrum, SaskTel does not believe it is possible for a wireless operator to launch a viable service using mmWave spectrum alone. Consumers are demanding a wireless service offering coverage over a far wider area than can be provided by mmWave spectrum alone.
96. Therefore, rather than using set-asides and spectrum aggregation limits to encourage a new facilities-based entrant into a market, SaskTel suggests that the spectrum auction rules should be structured to ensure that the mmWave spectrum being auctioned is acquired and utilized by the established wireless operator best suited to

efficiently deploy it. This can best be accomplished with a fair and level field, and with rules that rely on market forces alone, rather than artificial measures such as arbitrary spectrum aggregation limits or set-aside measures.

CONCLUSION

97. SaskTel believes that this consultation is timely, and that it is appropriate for the Department to move ahead with the development of licensing models and band plans for the 28 GHz, 37-40 GHz, and 64-71 GHz bands. Although 5G standardization work is still ongoing at 3GPP, and ITU decisions on these bands are expected at the WRC-19 conference in 2019, the benefits of proceeding forward now with this consultation outweigh the risks of any unexpected outcome from 3GPP and ITU decisions.
98. With the rapidly evolving 5G wireless technology suite, new network architectures, and with services and applications still to be defined, it is important that the Department be flexible in their policies and regulations for the new spectrum bands and new 5G network deployments.
99. SaskTel agrees with the proposed use of a flexible use licensing model in the 28 GHz and 37-40 GHz frequency bands, allowing both fixed and mobile services to be deployed.
100. SaskTel agrees with the proposal to designate the 64-71 GHz band for licence exempt use, in harmonization with the FCC. The licence exempt environment will promote innovation and allow new devices and services to be developed and deployed. Canadians will also benefit from the economies of scale that will be achieved from the large American device ecosystem.
101. We agree with the proposed band plans for the 28 GHz and 37-40 GHz bands, noting that they are harmonized with the FCC band plans.
102. Coexistence issues were raised in the Consultation between proposed new flexible use fixed and mobile systems and fixed satellite systems (FSS) in both the 28 GHz and 37-40 GHz bands. Questions were raised regarding coordination procedures and triggers, as well as proposed geographic restrictions on FSS earth stations. SaskTel notes that an RABC technical working group will be discussing in detail coexistence issues between new flexible use fixed and mobile systems and FSS earth stations,

including determination of PFD trigger values and manageable geographic restrictions. SaskTel recommends that the Department use the results and recommendations of the RABC technical working as guidance in their decisions.

103. The Department also posed questions regarding the treatment of existing 38 GHz licensees, noting that this band is heavily deployed in the same major urban centres where new 5G systems are expected to be deployed first. Because of the large number of deployments, 5G deployment in 38 GHz and transition of this band will be complex. A moratorium is inevitable on 38 GHz point to point systems licenced under the FCFS grid-cell and site-specific licenses, as well as those licenced under Tier 3 spectrum licences. SaskTel does not see a need for an immediate moratorium, but a moratorium will very likely be required at the time final decisions are made by the Department on licensing this band.

104. Due to the investments made by Tier 3 spectrum licence holders, SaskTel believes it would be appropriate for existing Tier 3 fixed spectrum licences in the 38 GHz band to be converted to Tier 4 based flexible use (fixed and mobile) spectrum licences only in Tier 4 areas where the licence holder has actually deployed systems. Because the flexible use fixed and mobile spectrum licences are more valuable than fixed licences, SaskTel proposes that the bandwidth of the new Tier 4 based flexible use spectrum licences be reduced to 60% of the bandwidth of the fixed licences. For example, a 50 MHz fixed spectrum licence would be converted to a 30 MHz wide flexible use fixed and mobile spectrum licence.

105. With regards to incumbent 38 GHz licensees and existing deployments, SaskTel notes the high level of deployment in this band in major urban centres. These links are heavily used for cell site backhaul, amongst other services. We believe that these systems must be protected from interference because of the impact of any potential disruption of services if these systems were not protected from 5G flexible use fixed and mobile system deployments. Therefore, SaskTel recommends that the existing FCFS licensees in the 38 GHz band be allowed to continue to operate and be protected from interference, as per paragraph 67 of the Consultation.

106. SaskTel is recommending that exclusive licensing be used in the 28 GHz and 37-40 GHz frequency bands, and that a competitive spectrum auction process be used because of the expected high demand for the licences in urban areas. Tier 4 based

spectrum licences would be most appropriate for the spectrum auction process in urban areas.

107. However, SaskTel sees low demand for this spectrum in rural areas. The low demand and the very limited range possible with mmWave spectrum makes Tier 4 based spectrum licensing inappropriate for rural based service areas, i.e. in Tier 4 service areas without an urban population centre.
108. SaskTel recommends that the Department offer grid-cell based spectrum licences for smaller population centres in rural areas on a first-come first-served basis (FCFS). This could easily be done after the initial spectrum auction is completed. This would allow operators to acquire small grid-cell based spectrum licences to serve smaller communities and other small population clusters in rural areas, and support innovation in serving all Canadians with 5G services.
109. SaskTel believes that longer licence terms, up to 20 years, would be appropriate for the flexible use fixed and mobile spectrum licences offered through this licensing process.
110. Finally, SaskTel recommends that a spectrum auction process be used with rules that create a level playing field for all bidders in order to allow market forces to be relied upon per ISED policy objectives. The wireless market in Saskatchewan has four facilities-based carriers, and is very competitive. The evidence of this is that Saskatchewan has some of the lowest consumer wireless prices in the country. Introduction of a fifth carrier in this market would be harmful to the market and very detrimental to consumers.
111. It would be detrimental to the market and for consumers to introduce artificial measures such as spectrum aggregation limits or spectrum set-asides in this auction. The Department has stated that the mmWave spectrum is complementary to low band spectrum, and SaskTel believes that it is not viable for a carrier to deploy mmWave spectrum without access to low band spectrum to offer the wide area coverage demanded by subscribers today. Therefore, SaskTel suggests that the auction rules be structured so that the spectrum will be utilized by the wireless operators in the best position to actually deploy the spectrum. This can best be accomplished by using an auction process with a level playing field for all bidders,

and with rules that rely on market forces alone, rather than on artificial measures such as arbitrary spectrum aggregation limits or set-aside measures.

112. SaskTel is pleased to have had the opportunity to provide our inputs and comments to the important issues raised in this Consultation, and hopes that our submission will provide a fuller view of these issues to the Department.