



TELUS COMMUNICATIONS COMPANY

Comments for

CONSULTATION on a LICENCE RENEWAL PROCESS for ADVANCED WIRELESS SERVICES and OTHER SPECTRUM

SLPB-002-17

June 2017

Spectrum Management and Telecommunications

July 25, 2017

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Executive Summary

1. TELUS appreciates the opportunity to provide input on the licence renewal process for AWS-1, PCS-G Block and I Block spectrum auctioned in 2008.
2. TELUS is in general support of the proposals.
3. TELUS recommends that the proposals be slightly modified so as to provide a slower ramp up in deployment requirements for PCS-G Block and I Block licences issued through the renewal process. This is in recognition of the long delay in ecosystem development in these bands as opposed to the AWS-1 band.
4. TELUS makes the recommendation with respect to the PCS-G Block as the single largest holder of PCS-G Block spectrum in Canada. TELUS makes the recommendation for the I Block as a party with no licences in the band and strictly based on parallel reasoning.
5. TELUS recommends that the Department apply the deployment levels at the Tier 3 population coverage level, within eight years of the new licence term, as provided in Annex B of the consultation for both PCS-G Block and I Block licences issued through the renewal process. TELUS would further suggest that, for the PCS-G Block, the Department apply deployment levels at the Tier 4 population coverage level provided in Annex C of the consultation within fifteen years of the new licence term.
6. TELUS also notes that paragraph 12 of the consultation incorrectly refers to Tier 3 as opposed to Tier 2 deployment requirements for the PCS-G Block in the *Licensing Framework for the Auction for Spectrum Licences for Advanced Wireless Services and other Spectrum in the 2 GHz Range*.
7. TELUS recommends yet again that the Department remove the research and development condition of licence because it no longer serves its purpose and is in fact detrimental because of its narrow scope.
8. The detail behind TELUS' recommendations and TELUS' comments in response to various questions raised by the Department follow in the main body of this document.

TELUS' Comments on Specific Questions Posed by ISED

A.

ISED invites comments on the assessment of the AWS-1, G Block and I Block equipment ecosystems.

9. As TELUS details below, the AWS-1 equipment ecosystem is very strong, the PCS-G Block equipment ecosystem has recently developed and the I Block ecosystem is currently non-existent to our knowledge.

AWS-1 Equipment Ecosystem

10. The AWS-1 ecosystem in Canada started to develop as soon as AWS-1 licences were issued after the 2008 auction and has continued to flourish. The US auctioned AWS-1 spectrum in 2006 and US operators (primarily T-Mobile USA) drove an HSPA ecosystem in the band that was heavily leveraged in Canada by regional entrants. Verizon and AT&T drove the development of a robust LTE ecosystem in the band that has been extensively leveraged in Canada by all operators. TELUS contributed to the development of the AWS-1 ecosystem by bringing support for state-of-the-art technologies such as 4x4 MIMO to the band. The AWS-1 band is one of the primary 4G mobile spectrum bands in Canada and as such should carry, in TELUS' view, aggressive deployment requirements.

PCS-G Block Equipment Ecosystem

11. The PCS-G Block spectrum has long been a marginalized band, given that it has been held exclusively by Sprint in the US since 2004 and Sprint has been very slow to commercialize it (presumably given their vast 2500 MHz holdings). Canadian regional entrant Public Mobile created a small Canadian CDMA ecosystem with ZTE support but was later consolidated and the spectrum has been migrated by TELUS to support LTE leveraging the ecosystem initially developed by Sprint.
12. Thus the PCS-G Block equipment ecosystem is far less robust than and has lagged the AWS-1 ecosystem. The PCS-G Block has been deployed for LTE about 7 – 8 years behind the AWS-1 ecosystem in Canada. There are a limited number of carrier aggregation profiles presently supporting 3GPP Band 25. To provide TELUS customers with the best user

experience, a well-developed Band 25 ecosystem in terms of LTE-Advanced features such as carrier aggregation must be developed. This is not the case today and it will take some time to get there.

I Block Equipment Ecosystem

13. Like the Department, TELUS is not aware of any ecosystem or commercially available solutions by any of the major network infrastructure providers for the I Block. To date, efforts to introduce the I Block within 3GPP have been confined to a study phase¹ initiated and driven by Lightsquared (now Ligado); however, no standardization work has yet begun to introduce a band which includes the I Block. Ligado is currently attempting to combine the I Block with the adjacent 5 MHz from 1675 – 1680 MHz to create a 10 MHz contiguous block from 1670 – 1680 MHz. However, Ligado's application for the reallocation of the 1675 – 1680 MHz block in the US is currently under review by the FCC and faces opposition from more than 20 parties with interests in AWS-3, satellite communications, weather and other environmental data. Thus the development of an ecosystem which supports mobile technology deployment in the I Block remains highly unlikely in the near future.

B.

ISED invites comments on the proposal to renew AWS-1, G Block and I Block licences that have met their conditions of licence.

14. TELUS strongly agrees with the proposal to renew AWS-1, PCS-G Block and I Block licences that have met their conditions of licence.
15. As the Department notes, these licences have a high expectation of renewal unless a breach of licence condition has occurred, a fundamental reallocation of spectrum to a new service is required or an overriding policy need arises.

¹ 3GPP TR36.844 v13.2.0 (2015-03-28), *Study on expansion of LTE in the 1670-1675 MHz Band for the United States to include 1670-1680 MHz Band*.

16. The Department confirms in the consultation that it is not planning any fundamental reallocation of this spectrum, nor does TELUS believe there would be any reason for a fundamental reallocation. This includes in TELUS' view the I Block where the allocation is not the issue, the market / ecosystem is.
17. The Department confirms in the consultation that it does not see any overriding policy need that would preclude renewal of these licences and neither does TELUS.

C.

ISED invites comments on the likely timeframe for availability of equipment capable of providing access to licensed spectrum on an opportunistic basis.

18. DSA (Dynamic Spectrum Access) technologies implemented through cognitive radio (i.e., self-awareness, context-awareness and adaptability to the surrounding wireless environment) hold great promise to improve the efficiency of overcrowded radio spectrum. Despite years of preliminary study, DSA technologies still remain under development.
19. Current DSA development efforts are centered around improving the utilization of licence exempt spectrum (as opposed to licensed spectrum) via opportunistic access using License Assisted Access (LAA) technologies for LTE. This involves implementing the Listen-Before-Talk technique and LAA support will also be included in the specifications for New Radio (NR) in the context of 5G.
20. The US efforts in developing a Spectrum Access System (SAS) to provide opportunistic access to licensed spectrum, such as for the Citizens Broadband Radio Service (CBRS) band, along with similar efforts globally (such as Licensed Shared Access (LSA) in Europe) are at an early stage of trial and experiment, and have not yet been proven to be an effective and commercial ready solution for DSA. It is worth noting that the first phase of CBRS will not make use of spectrum sensing capabilities, resulting in a “less than dynamic” access based on rudimentary database techniques.
21. The limited adoption of TVWS (TV White Space) technologies serves as an example of the ramifications of introducing immature technologies with underdeveloped ecosystems.

22. TELUS believes that the mobile industry is still at least 3 to 5 years away from DSA technologies that would be appropriate for consideration for use at a commercial scale. Operators would need to test and trial these technologies before being consulted on how they might be implemented in Canada.
23. TELUS recognizes the Minister's authority to update licence conditions but highlights the availability of nearly 8 GHz of licence exempt spectrum already at the disposal of Canadian innovators (along with an additional 7 GHz proposed in the currently open *Consultation on Releasing Millimetre Wave Spectrum to Support 5G* (SLPB-001-17)) versus the mere 648 MHz of cellular radio mobile spectrum (CMRS) currently available to the mobile industry.
24. In TELUS' view, immature DSA technologies should not be applied to current and planned mainstream CMRS assignments for the foreseeable future. On the other hand, TELUS recognises the great value of developing DSA technologies for enabling opportunistic access to licence exempt spectrum and any underutilized licensed satellite and fixed service spectrum and would support such initiatives after they materialize and are fully tested.

D.

ISED invites comments on the proposal to renew AWS-1 and G Block licences that have complied with their conditions of licence for a new term of 20 years and I Block licences that have complied with their conditions of licence for a new term of 10 years.

25. TELUS supports the proposal to renew AWS-1 and PCS-G Block licences that have complied with their conditions of licence for a new term of 20 years.
26. The 20 year renewal term for AWS-1 and PCS-G Block licences is appropriate given the 20 year terms for 700 MHz, 2500 MHz and AWS-3 licences auctioned in the 2015 and the relatively recent Cellular 850 and PCS renewals (as the Department notes in the consultation). These are all bands where the Department is presumably not planning any fundamental reallocation, nor envisioning any overriding policy need that would preclude the long term renewal of these licences. A 20 year term provides an incentive for companies to expand their networks as the Department notes.

27. TELUS supports the proposal to renew I Block licences that have complied with their conditions of licence for a new term of 10 years. The shorter 10 year renewal term, should any I Block licences in fact be renewed, is appropriate given the ongoing uncertainty about the eventual use in the band.

E.

ISED invites comments on the proposal to apply deployment levels at the Tier 4 population coverage level, within eight years of the new licence term, as described above and provided in annex C, to the AWS-1 and G Block licences issued through the renewal process.

28. TELUS holds both AWS-1 and PCS-G Block licences and is therefore intimately aware of the state of development of the respective ecosystems in Canada as the well as the state of respective deployment within the bands in Canada.
29. For the AWS-1 band, which almost all operators in Canada have been deploying for almost a decade, TELUS supports the proposal to apply deployment levels at the Tier 4 population coverage level, within eight years of the new licence term, and provided in Annex C of the consultation. TELUS suggests that eight years is more than ample time to reach these deployment levels and would prefer that licensees be required to achieve these levels within five years of the new licence term for the benefit of Canadians. However, TELUS assumes that the Department has taken into consideration the cascade of deployment obligations across the AWS-1 and AWS-3 bands and likely concluded that eight years was more appropriate.
30. For the PCS-G Block, which TELUS notes has only been suitable for recent deployment (due to a relatively delayed ecosystem), TELUS recommends that the Department apply deployment levels at the Tier 3 population coverage level, within eight years of the new licence term, as provided in Annex B of the consultation. TELUS further suggests that, for the PCS-G Block, the Department apply deployment levels at the Tier 4 population coverage level as provided in Annex C of the consultation within fifteen years of the new licence term.

31. TELUS also notes that paragraph 12 of the consultation incorrectly refers to Tier 3 as opposed to Tier 2 deployment requirements for the PCS-G Block in the *Licensing Framework for the Auction for Spectrum Licences for Advanced Wireless Services and other Spectrum in the 2 GHz Range*. PCS-G Block licences should be assessed for renewal on the basis of the Tier 2 targets found in Appendix C of the licensing framework and not the Tier 3 targets found in the same Appendix, as the licences were originally issued based on Tier 2 service areas as specified in the *Policy Framework for the Auction for Spectrum Licences for Advanced Wireless Services and other Spectrum in the 2 GHz Range*.

F.

ISED invites comments on whether or not the proposed Tier 4 deployment option should apply to I Block licences issued through the renewal process.

32. TELUS does not believe that the proposed Tier 4 deployment option should apply to I Block licences issued through the renewal process; however, TELUS notes that the issue would be moot if there were no I Block renewals.
33. I Block licences issued through the renewal process, if there are any successful renewals, would presumably be based on some new use of the band in the next year or so which met the deployment levels specified in Appendix C of the original licensing framework.
34. For reasons similar to TELUS' reasons for recommending a slower ramp up of deployment requirements for the PCS-G Block, TELUS would also support a slower ramp up of deployment requirements for I Block licences.
35. TELUS would recommend that the Department apply deployment levels at the Tier 3 population coverage level, within eight years of the new licence term, and provided in Annex B of the consultation.

G.

ISED invites other proposals for deployment requirements for the AWS-1, G Block and I Block licences issued through the renewal process.

36. As noted in TELUS' response to Question E, TELUS recommends no changes to the proposal for AWS-1 deployment requirements but does recommend a longer staging of the PCS-G Block deployment requirements based on the relative states of deployment at present.
37. For the PCS-G Block, TELUS recommends that the Department apply deployment levels at the Tier 3 population coverage level, within eight years of the new licence term, and provided in Annex B of the consultation. TELUS would further suggest that, for the PCS-G Block, the Department apply deployment levels at the Tier 4 population coverage level, within fifteen years of the new licence term, and provided in Annex C of the consultation.
38. For the I Block, TELUS recommends that the Department apply deployment levels at the Tier 3 population coverage level, within eight years of the new licence term, and provided in Annex B of the consultation. TELUS would further suggest that, for the I Block, the Department apply deployment levels at the Tier 4 population coverage level provided in Annex C of the consultation as part of any subsequent renewal process.

H.

ISED invites comments on the proposed conditions of licence for the AWS-1, G Block, and I Block licences issued through the renewal process as set out in annex A.

39. TELUS supports the majority of the proposed conditions of licence (COLs) outlined in Annex A of the consultation. TELUS proposes that the Department eliminate the research and development COL and, with respect to the mandatory roaming COL, suggests that the Department initiate an update to CPC-2-0-17.
40. The research and development (R&D) condition of licence has been included in mobile spectrum licences for many years. However, TELUS proposes that the R&D licence should be removed entirely, because it no longer serves any purpose.

41. Notably, the R&D COL was removed for some licensees as a result of the Department's decision in Guidelines for Compliance with the Radio Authorization Condition of Licence Relating to Research and Development (GL-03). The key aspect of those amendments was that an exemption was granted to any licensee that has less than \$1 billion in annual gross revenue (from the provision of wireless services in Canada, averaged over the term of the licence), from the requirement to invest 2 percent of its adjusted gross annual revenue resulting from the use of this licence (averaged over the term of the licence, in eligible research and development activities related to telecommunications). This decision shows that ISED has previously recognized the lack of utility and necessity of this licence condition, at least as it pertains to some licensees.
42. As it has done in previous consultations, TELUS calls upon the Department to remove the R&D COL altogether for all licensees. Such removal would enhance competitiveness as all licensees would be treated equally.
43. More importantly, removal of the R&D COL would not cause any negative effects in terms of licensee investment in wireless technology. Canada is a world leader in deployment of advanced wireless networks and capital intensity. Smartphone penetration is extremely strong and customers in Canada consume a massive amount of wireless data. Therefore, all licensees already have the competitive impetus to invest in new technology, network deployment and infrastructure upgrades. Thus, removal of the R&D COL would be beneficial in that licensees would make their investments based on the best means to serve customers in the competitive marketplace across the country, rather than forcing a portion of their capital investment to fall within the strict parameters of the R&D COL.
44. The benefits from the R&D COL have long ago been realized. Retaining the requirement at this stage merely diverts necessary and scarce capital to sub-optimal activities and away from true productivity and innovation enhancing investments. In addition, licensees need as much flexibility as possible to make investments as they see fit in light of market conditions, rather than being forced to invest 2% of revenues in a prescribed list of research and development activities. As a result, TELUS requests that this R&D COL be removed in its

entirety, so that no licensee, no matter how much revenue it generates annually, is subject to this requirement.

45. TELUS notes that if the R&D COL was rescinded as TELUS recommends, the annual reporting COL would need to be amended to remove the necessity to report on R&D activities.
46. With respect to the mandatory roaming COL, TELUS notes that the regulatory rules pertaining to the provision of roaming have changed dramatically in recent years. In particular, the provision of roaming by TELUS, Bell and Rogers to other wireless carriers is now subject to tariff as regulated by the CRTC, by way of Telecom Regulatory Policy 2015-177. The tariffs set out mandated terms and conditions and are subject to rate regulation. Moreover, off-tariff arrangements for roaming are permitted by way of Telecom Decision CRTC 2017-56.
47. Given these recent CRTC decisions, the mandatory roaming COL as set out the Department's CPC-2-0-17 should be reconsidered. In particular, the current situation gives rise to unnecessary and duplicative regulation, so the Department could investigate to what extent CPC-2-0-17 could be amended. With the backdrop of CRTC tariff regulation, the new entrants, the licensees that purportedly needed mandatory roaming, no longer require the mandatory roaming condition of licence. To be clear, TELUS proposes that the Department initiate a consultation to reconsider CPC-2-0-17's mandatory roaming conditions, but mandatory tower and site sharing do not need to be reviewed.

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