



**TELUS COMMUNICATIONS COMPANY**

**Reply Comments for**

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

SLPB-002-17

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Spectrum Management and Telecommunications

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## Executive Summary

1. TELUS appreciates the opportunity to provide reply comments on the licence renewal process for AWS-1, PCS-G Block and I Block spectrum auctioned in 2008.
2. TELUS reiterates its general support of the proposals.
3. TELUS does not support, as called for by some respondents, the elimination of deployment requirements for the renewal term of AWS-1 licences. TELUS supports the Department's proposal to apply more strenuous deployment requirements over the renewal term to ensure that the spectrum is put to use for the benefit of Canadians in all regions of the country. TELUS views calls for the elimination of deployment requirements as an indication of an operator's disinterest in being forced to deploy, sell or subordinate their unused spectrum for the benefit of Canadians in the more rural and remote regions of the country.
4. Worse, it is an indication of an operator's disinterest in investing versus relying on government mandated roaming rights. Reliance on roaming rather than deployment is in direct conflict with the Department's goal to foster facilities-based competition. In this regard, TELUS requests that the Department reconsider CPC-2-0-17's mandatory roaming conditions and in particular, the mandate to provide roaming at rates set through arbitration to national incumbent wireless service providers, paying specific attention to the inclusion in the mandate of in-footprint roaming. New provisions introduced in 2013 are having profound negative effects on facilities-based competition in this country and the initial round of responses has provided corroborating evidence of this fact.
5. TELUS does not support the respondents that called for Tier 3 rather than Tier 4 requirements as part of the renewal term of AWS-1 licences, which is, again, an indication of an operator's disinterest in being forced to deploy, sell or subordinate their unused spectrum for the benefit of Canadians to enable greater broadband infrastructure in rural and remote regions of the country as well as an indication of an operator's disinterest in investing versus relying on government mandated roaming rights.
6. TELUS firmly supports the proposed Tier 4 deployment requirements by year 8 of the renewal term for the AWS-1 spectrum which enjoys a robust ecosystem and which has

already been the mainstay band for regional cableco operators for almost a decade. The proposed Tier 4 deployment requirements (to be addressed by circa 2027) further the Department's and the CRTC's goals for broadband connectivity for all Canadians. The Department's spectrum policy framework recognized the use of flexible spectrum management tools which would facilitate the deployment of communications in rural areas. When the Department announced the Connect to Innovate program, it stated that Canadians need access to high-speed Internet to fully participate in our economy and that challenging geography and smaller populations of rural and remote communities present barriers in building and maintaining high-speed Internet infrastructure. Stringent spectrum licence deployment requirements can alleviate some of these barriers by demanding coverage assessed across Tier 4 regions. Finally, in Telecom Regulatory Policy CRTC 2016-496, the CRTC focused on the goal of connectivity to rural and remote areas, stating that Canadians in these regions do not have Internet access services comparable to those offered to the vast majority of Canadians in terms of speed, capacity and quality.

7. For PCS-G Block and I Block licences issued through the renewal process, TELUS recommends that the proposals be slightly modified so as to provide a slower ramp up in deployment requirements. This is in recognition of the long delay in ecosystem development in these bands as opposed to the AWS-1 band, but would still require, in time, the same meaningful deployment in these bands.
8. TELUS makes recommendations 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.
9. 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.

10. TELUS and the entire industry recommend 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. Full removal of the research and development condition should be applied to all licensees on a symmetrical basis.
11. The detail behind TELUS' recommendations and TELUS' reply comments in response to the initial comments of other respondents to the 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.

12. 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**

13. As noted in TELUS' initial response, 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**

14. 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.
15. 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.
16. TELUS' view above of the PCS-G Block ecosystem was substantiated by almost every one of the initial respondents that addressed this sub-question. Rogers specifically observed that there are currently far fewer handsets supporting PCS-G Block (Band 25) than mainstream PCS (Band 2). Furthermore, Rogers noted that there are few LTE Carrier Aggregation combinations including Band 25, but that a large number of combinations include than those which include both Band 2 and Band 4. Both of these observations further illustrate the lag between AWS-1 and PCS-G Block ecosystems.

### **I Block Equipment Ecosystem**

17. Like the Department, TELUS and all other respondents are 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 phase<sup>1</sup> initiated and driven by Lightsquared (now Ligado); however, no standardization work has yet begun to introduce a band which includes the I Block. Ligado

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<sup>1</sup> 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.*

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.

18. TELUS strongly agrees with the proposal to renew AWS-1, PCS-G Block and I Block licences that have met their conditions of licence (COLs).
19. 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.
20. 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.
21. 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 nor any of the other respondents to the consultation.
22. While this renewal consultation does not ask the question of how strictly compliance with the deployment requirements from the 2008 AWS-1 Licensing Framework will be assessed, Shaw constructs elaborate arguments in its response to justify how it should qualify for renewal while (presumably) not meeting the original deployment requirements specified by

the Department. Shaw's arguments are based on the fact that the language of "roll-out targets" was used rather than "deployment requirements." TELUS notes that throughout the current consultation paper, the Department refers several times to the "deployment requirements" outlined in Appendix C of the (2008) Licensing Framework, confirming that the Department indeed intends to assess licensees based on their deployment in compliance with these requirements when determining whether to renew their licences.

23. TELUS notes that the use of "targets" in the original licensing framework was presumably used because of mid-term (five year) requirements to be met in order to qualify for ongoing access to in-territory roaming. In TELUS' view, all licensees have been able to work towards satisfying these relatively modest deployment requirements over the past ten years, and the Department should hold licensees to these levels in assessing their licences for renewal. In this regard it would be prudent for the Department to not allow for a lengthy delay before the release of its AWS-1 renewal decision so that operators asking for lenience (undoubtedly due to having not yet met their deployment requirements as of circa year 8 in their 10 year licence term) have as much time as possible to satisfy their deployment requirements via deployment, subordination or sale before their respective licences expire, some as late as September 2019.
24. One exception to our proposal in the previous paragraph which may merit consideration by the Department is how to treat the renewal of Xplornet's licences in Manitoba. TELUS notes that the transfer of spectrum from MTS to Xplornet as part of Bell's acquisition of MTS took place less than six months before the publication of this renewal consultation. While Xplornet has not explicitly requested an exception or extension of their deployment requirements, it would seem appropriate that it be permitted a reasonable amount of time to deploy their newly acquired spectrum. Xplornet's only AWS-1 spectrum is in Manitoba and given that they did not acquire any of MTS' network assets in the transaction, they are building a mobile network from scratch. They are understandably the furthest behind all AWS-1 licensees in terms of meeting the deployment requirements. As such, TELUS suggests that our proposal for strict assessment of the original deployment requirements need not necessarily apply in the same way to Xplornet as it would to any of the original

2008 AWS-1 licensees, including Shaw (Wind / Freedom). The Department might consider an aggressive time frame to remedy any Xplornet breaches at time of renewal.

25. For the I Block, some respondents seek either an extension of the initial term or a long term renewal (by waiving the deployment requirements), justified by the absence of an I Block ecosystem. Naturally, those in support of extension or renewal are holders of I Block spectrum. TELUS is strongly opposed to any CMRS licences being renewed without having met all conditions of licence. Bell incorrectly asserts that auctioned licences in the 24 and 38 GHz spectrum bands were extended in 2007 due to limited equipment availability. What was in fact granted in 2007 was an extension of mid-term deployment requirements, similar to the extensions granted for the 2300 and 3500 MHz bands in 2009 and 2012. While TELUS is aware of these examples of extending mid-term spectrum implementation requirements, we are not aware of any precedent for a licence itself being extended upon reaching the end of its term with unsatisfied deployment requirements. TELUS also notes that the I Block holders cumulatively spent<sup>2</sup> only \$2.5m on these licences with no I Block licensee spending more than \$950,000. TELUS is not a holder of I Block spectrum, but spent \$576,250 on withdrawal fees associated with I Block spectrum in 2008 as a result of the grossly flawed auction design<sup>3</sup> and is therefore not particularly sympathetic to I Block licensees concerned about similarly writing off modest stranded spectrum capital expense.
26. In summary, TELUS strongly recommends Department only renew licences in *any* of the three bands that meet all original conditions of licence, with the possible exception of Xplornet in Manitoba.

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<sup>2</sup> See: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09003.html#>

<sup>3</sup> C.M. Dippon, NERA Economic Consulting. *Regulatory Policy Goals and Spectrum Auction Design: Lessons from the Canadian AWS Auction*, March 2009.

**C.**

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

27. 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.
28. 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.
29. 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.
30. The limited adoption of TVWS (TV White Space) technologies serves as an example of the ramifications of introducing immature technologies with underdeveloped ecosystems.
31. 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 possible 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.
32. 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.

33. 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 the technologies materialize and are fully tested.
34. TELUS notes that all respondents generally called for the Department to proceed with caution when considering opportunistic access to licensed spectrum, to allow more time for technologies to develop, and to plan for robust future consultation before ever considering the use of DSA in any licensed (exclusive use) CMRS bands.

**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.

35. TELUS and all other respondents support 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.
36. 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 2014 - 2015 timeframe 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.
37. 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. TELUS does not support a 20 year renewal for the I Block nor an extension of the initial term.

**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.

38. 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.
39. In their response to Question E, Rogers requested the elimination of deployment requirements and several respondents (Eastlink, Québecor, SaskTel and Shaw) supported the less stringent “Option 1” deployment requirements while also alluding to mandated roaming costs. In light of these comments, it is important to note the very strong connection between mandated roaming and deployment requirements. The Department needs to carefully consider these two regulatory tools in concert. Deployment requirements drive investment, particularly in less populated regions of the country while mandated roaming provisions do the exact opposite. Mandated roaming reduces the incentive to invest in facilities in less populated regions. As Bell noted in Paragraph 23 of their response, “the mandatory roaming CoL creates an opportunity for network arbitrage whereby one carrier can make the strategic decision not to invest in or upgrade its own network in favour of roaming on one or more of its competitors' networks.” TELUS is seeing this phenomenon appear at a rapidly increasing rate (and will be filing a detailed confidential supplement to this proceeding with the Department highlighting how reliance on roaming is having deleterious effects on facilities-based competition in some areas.) This is the context in which TELUS provides its detailed reply comments on deployment requirements below.

### **AWS-1 Deployment Requirements**

40. For the AWS-1 band, which almost all operators in Canada have been deploying for almost a decade, TELUS supports the “Option 2” 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. Eight years is more than ample time to reach these deployment levels. TELUS assumes that the Department has taken into consideration the cascade of deployment obligations across the AWS-1 and AWS-3 bands and concluded that eight years is appropriate.
41. SaskTel took a similar position to TELUS in supporting the Department’s “Option 2” proposal for Tier 4 population coverage. However, while SaskTel was generally supportive of this proposal, they recommended potential modifications.
42. In the two<sup>4</sup> of the eleven Tier 4 service areas in Saskatchewan which do not contain a population centre of more than 10,000 people, SaskTel recommends that AWS-1 and PCS-G Block deployment requirements should be able to be met by providing coverage using other spectrum such as 700 MHz or PCS. The focus of this renewal consultation is on ensuring that AWS-1 and PCS-G Block licences are put to good use, and not on a special policy provision allowing conditions of licence to be satisfied by the meeting of the COLs in other bands.
43. SaskTel also suggests that the specific population coverage percentage of 50% suggested by the Department for the Prince Albert Tier 4 (4-128) service area is too aggressive, and proposes a relaxed alternative of 30%-35%. TELUS would not presume to understand SaskTel’s market better than SaskTel themselves, and thus supports the request for the Department to review and consider such a modification. However, if such a change would create an exception to an otherwise consistent methodology for determining population coverage percentages. TELUS suggests that the Department may wish to consider broadening the scope of such a review to include rural Tier 4 service areas nationally and ensure that consistent logic is being applied in determining the appropriate population

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<sup>4</sup> Watrous (4-126) and Northern Saskatchewan (4-130)

coverage percentages across all licence areas to the benefit of all operators struggling to meet their deployment requirements.

44. Of the three AWS-1 entrants (Eastlink, Shaw, and Québecor) responding to the consultation, all supported the “Option 1” proposal of Tier 3 requirements and opposed to “Option 2” (Tier 4). While their comments together seem to present a unified rationale for this recommendation (e.g., pointing to the inherent challenges and capital intensity of deploying wireless networks), the degree to which each attributes to external forces their projected inability to satisfy more stringent deployment requirements varies greatly.
45. Québecor brings the most balanced view of these three respondents. They do not point fingers and blame others to justify their position; rather, they illustrate their concerns with technical, economic, and business challenges involved in expanding a mobile network build to rural markets. While TELUS respects Québecor’s approach to taking accountability for their own business plans, we do not agree that the “Option 2” proposal would [translated] “favour the three large national wireless carriers to the detriment of new entrants.”<sup>5</sup> Having recently divested their out-of-region AWS-1 spectrum to Rogers (and their 700 and 2500 MHz spectrum to Shaw), receiving heavily subsidized access to AWS-1, 700 MHz, AWS-3 and 2500 MHz spectrum and operating with a strong balance sheet, TELUS does not believe that Québecor’s self-characterization as a “new entrant” still holds within their regional market. With ten years of wireless network build behind them and eight years ahead proposed to address the new build requirements, their claims of an unfair advantage seem unsubstantiated.
46. Eastlink takes a far different approach to justifying their opposition to the Department’s proposed application of Tier 4 deployment requirements. Rather than speaking to their own capabilities and challenges, Eastlink blames both the Department and the CRTC for Eastlink (presumably) falling short in satisfying its deployment requirements. Eastlink makes this assertion despite having received preferential treatment far beyond that which was originally proposed in the AWS-1 licensing framework when they took on these deployment obligations. (More specifically, the extension of in-territory roaming beyond the

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<sup>5</sup> Paragraph 35 in Québecor’s response.

Department's original five-year policy framework proposal, updated tower sharing rules, subsidized access to 700 MHz, AWS-3 and 2500 MHz spectrum, and the more recent CRTC reviews and decisions introducing wholesale roaming tariffs.) Eastlink partly attributes its projected inability to meet deployment requirements in rural service areas to its concern that new CRTC roaming tariffs, currently set at interim rates with the final rate approval ongoing, are not inexpensive enough so as to make viable even limited investments in network infrastructure in the low population town centres.

47. Eastlink's argument is, of course, a red herring. The purpose of network deployment requirements is to ensure that licensees work to fulfill the Department's stated objective of utilizing scarce spectrum resources to deliver the benefits of wireless coverage and competition to Canadians. This purpose is wholly independent of the availability of mandated roaming. In any event, Eastlink has access to tariffed roaming under the CRTC's roaming policy, which will set rates based on Phase II costs. There is simply no basis for Eastlink to state that a potential lack of deployment is the result of some alleged CRTC policy failing.
48. The one area where TELUS is sympathetic to Eastlink's position is on the matter of incidental roaming access for service providers that rely on Wi-Fi connectivity as their "home" wireless network. As Eastlink notes, there is a very slippery slope in applying such logic when many Canadians do already consume much of their mobile data on private, public, and carrier-operated Wi-Fi networks. TELUS concurs that a decision to overturn the current CRTC policy in extending mandatory roaming to MVNOs or "Wi-Fi first" providers would create a strong disincentive to facilities-based mobile network competition – the exact opposite effect of what this renewal consultation is aiming to accomplish with the proposals for increasingly stringent deployment requirements that TELUS strongly favours.
49. In contrast to Québecor and Eastlink, Shaw takes somewhat of a "middle ground" approach in explaining their rejection of the "Option 2" proposal for Tier 4 deployment requirements. Interestingly, Shaw points to some of the regulatory challenges that Eastlink targets in their arguments, but references them primarily as WIND's historical challenges, and notes that

the Department and Parliament did take action to address their concerns. They agree with Eastlink on the continued uncertainty over mandated wholesale roaming rates, but do not use them to justify a projected inability to satisfy Tier 4 deployment requirements.

50. Instead, Shaw attributes their concerns with more stringent deployment requirements to their claimed deficiency in “low-frequency spectrum.” This is where their argument begins to falter by intimating excuses for future non-compliance to any mid-band coverage requirements. If Shaw really were “willing to commit capital and other resources to provide an alternative to the wireless incumbents outside of the large cities,” as they suggest, one might think that they would be supportive of more stringent deployment requirements in rural markets. Shaw argues that Tier 4 requirements would be “jeopardizing any possibility of competitors deploying innovative and differentiated networks in less populated areas outside of big cities”. TELUS finds this illogical. It seems to suggest that innovative and differentiated networks will not satisfy deployment requirements. Clearly the setting of increasingly stringent deployment requirements necessitates licensees to deploy networks in less populated areas or sell or subordinate their spectrum in the less populated areas so that competitors can deploy innovative and differentiated networks (i.e., “use it or lose it”), from which subscribers would draw benefits.
51. As for Rogers, TELUS opposes its positions on deployment requirements. Rogers notes that in the PCS and Cellular band renewal processes, renewed licences did not include any deployment requirement conditions of licence. Rogers suggests that a similar treatment would be appropriate in this renewal process for all licences which are in full compliance with their conditions of licence. While TELUS is generally in support of a light-handed regulatory framework with maximum reliance on market forces, the Department’s deployment requirements assist in the fulfillment of the Department’s spectrum policy objective. Notably, mandating that licenses attain minimum deployment helps to ensure that scarce spectrum resources are utilized to maximize the economic and social benefits for Canadians.
52. Furthermore, deployment requirements are also critical so that the Department can continue to incent facilities-based competition even where roaming is mandated. In Paragraph 23 of

their response, Bell raised significant concerns with the mandatory roaming COL. One particularly salient point in their critique was the concern with “an opportunity for network arbitrage” that would not exist in the absence of mandatory roaming, whereby a carrier may find preferable economics in having their customers roam on another carrier’s network rather than building out an expansion of their own network. In TELUS’ view, this type of arbitrage opportunity runs completely counter to two of the stated policy objectives<sup>6</sup> of “supporting competition” and “encouraging investment.” As noted in our reply comments on Question E above, TELUS has observed this phenomenon (of the apparent exploitation of network arbitrage) with increasing frequency, and strongly recommends that the Department follow through with its proposals to apply increasingly stringent deployment requirements to help mitigate, but not eliminate (as we explain in our reply comments to Question H), the effect of mandatory roaming on reducing facilities-based competition and infrastructure investment.

53. In a further attempt to minimize deployment requirements, Rogers constructs arguments about increased interference and unwieldy coordination overhead associated with population coverage requirements based on Tier 4 service areas. In TELUS’ view, Rogers’ claims are technically unsound – comparing AWS-1 FDD deployments to 3.5 GHz TDD for the purposes of such arguments makes little sense. Whereas border coordination between TDD operations (such as the 3.5 GHz band being used by Rogers via Inukshuk and by adjacent regional operators) involves both synchronization and uplink / downlink frame alignment challenges that are both technology and service requirement dependent, FDD coordination for AWS-1 (or any other FDD band) is a much simpler problem to address. Regardless of the size of a service area, FDD coordination requires co-channel operators at common borders to ensure that their power flux density (PFD) levels do not exceed a certain threshold at their common licence area boundaries. Rogers seems to be saying that by imposing more stringent deployment requirements in the Tier 4 service areas nested within a licensee’s Tier 2 and 3 licences, new coordination challenges somehow arise which are somehow not possible to accommodate. But, in the Department’s proposed options for new

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<sup>6</sup> Paragraph 3, *Revised Frameworks for Mandatory Roaming and Antenna Tower and Site Sharing*, (Canada Gazette DGSO-001-13), March 2013.

deployment requirements, this would only (presumably) be the case if a licensee did not meet the newly proposed requirement, had a portion of their licence revoked for non-compliance, and as a result, created a new inter-operator border. If Rogers simply committed to building their network to the more stringent deployment requirements (regardless of the service area associated with the requirement), no such modification of inter-operator borders would take place.

54. Bell makes a similar observation to Rogers in comparing the proposals within this renewal process to historical processes for other bands; specifically, Bell notes that introducing expanded spectrum deployment requirements as part of a licence renewal is “unusual”, and unlike TELUS, suggests that they would not support this as a general principle. However, Bell differs drastically from Rogers in their conclusions about the appropriate treatment of the AWS-1 band in this renewal process. Not only does Bell support the Department’s more stringent “Option 2” proposal of applying Tier 4 deployment requirements within eight years of the new licence term, but they go beyond this recommendation to suggest that the Department consider an accelerated 5-year time frame for this assessment. Bell explicitly acknowledges that the application of such increasingly stringent deployment requirements is consistent with the Department’s support of promoting facilities-based competition.

#### **PCS-G Block Deployment Requirements**

55. 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.
56. TELUS notes a broad range of responses on the subject of PCS-G Block deployment requirements. Most respondents who commented on this topic did not make specific recommendations for the PCS-G Block, but rather suggested harmonized deployment requirements between AWS-1 and PCS-G Block licences (Rogers, Shaw, Xplornet at Tier

3 levels; SaskTel and Ecotel at Tier 4 levels). Bell suggests that given the state of the PCS-G Block ecosystem, expanded coverage requirements (beyond the 2008 Licensing Framework) are unnecessary. While TELUS recognizes and appreciates the variety of views posed in these consultation responses, we stand by our recommendation (as the largest PCS-G Block licensee) to consider increasingly stringent deployment requirements (adjusted for the delayed PCS-G Block ecosystem) in order to continue to promote ISED's objective of facilities-based competition.

57. 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 requirements found in Appendix C of the licensing framework and not the Tier 3 requirements 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*. In other words, there is a single digit typo in Paragraph 12 of the consultation that would concern any observant PCS-G Block licensee, such as TELUS. TELUS notes that the correct Tier 2 deployment requirements were proposed in the Department's recently issued *Consultation on a Licensing Framework for Residual Spectrum Licences in the 700 MHz, 2500 MHz, 2300 MHz, PCS and 1670-1675 MHz Bands* (SLPB-003-17), and appear in Annex F (Table F4) for the licence areas being considered for the residual auction process. These Tier 2 requirements were referred to in Paragraph 24 of that consultation as "consistent with licences for the same bands issued through previous auctions." TELUS suggests that the sooner the Department clarifies this typo, the better – it need not wait until it releases its decisions emanating from this consultation.

**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.

58. 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.
59. 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.
60. 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.
61. 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. TELUS notes that there were no respondents to the consultation who supported Tier 4 deployment requirements. Proposals from those who answered the question suggested that application of either the initial coverage requirements (from the 2008 licensing framework) or the "Option 1" (Tier 3) coverage requirements at most would be appropriate.

**G.**

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

62. 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.

63. 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. This recognizes the roughly 8 year lag between AWS-1 and PCS-G ecosystems.
64. Should any I Block licences be renewed, TELUS recommends that the Department apply deployment levels at the Tier 3 population coverage level (as provided in Annex B of the consultation) within eight years of the new licence term, and also recommends that 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 – a recommendation consistent with our PCS-G Block proposal above. If, as expected, all I Block licences are returned to the Department following a breach of their existing deployment requirement COL, TELUS would encourage the Department to follow SaskTel’s proposal that the licences be “held by ISED until such time as an industry direction on I Block spectrum emerges.” At that point in time, the Department could assess the demand for the I Block spectrum via public consultation, determine whether a competitive licensing process would be appropriate for its award, and reconsider the appropriate deployment requirements in light of ecosystem developments.

**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.

65. TELUS continues to support the majority of the proposed conditions of licence outlined in Annex A of the consultation, but based on the input of other respondents, TELUS expands its recommendations for change. TELUS continues to strongly advocate that the Department eliminate the research and development COL. With respect to the mandatory roaming COL, TELUS continues to propose that the Department initiate an update to CPC-2-0-17 with an eye to removing the mandated roaming provisions now covered via CRTC

tariffs. Upon review, TELUS echoes the input of Bell, the CWTA, Québecor, and SaskTel who all advocate for change to reduce the administrative burden of annual reporting.

#### **R&D Condition of Licence**

66. The research and development (R&D) condition of licence, included<sup>7</sup> in all or most mobile spectrum licences since 1991, has run its course and Bell, CWTA, Eastlink, Rogers, Québecor, Sasktel and Shaw have all called for its removal entirely along with TELUS.
67. As noted in its comments, 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. TELUS also reiterates that 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.
68. TELUS highlights Bell's specific comments on this issue. Bell noted a number of frailties with the R&D COL, including that it serves as a constraint on the operating flexibility of wireless licensees with limited, if any, evidence that it benefits Canadians, it treats licensees asymmetrically in that some licensees are not subject to the requirement and that spending that satisfies the R&D requirement might be better and more productively expended on other operating activities. As such, Bell called the R&D COL "both unnecessary and out-of-step with today's modern wireless industry."
69. In short, the widespread support for removal of this COL is based on ensuring a framework that places maximum reliance on market forces, consistent with the Department's spectrum

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<sup>7</sup> *Decisions on Conditions of Licence Regarding Research and Development and Learning Plans, (Canada Gazette SLPB-002-14)*, February 2014. "In 1983, Cantel (now Rogers) made a commitment in its cellular licence application to purchase handsets from Canadian manufacturers only. This commitment was later modified to a requirement that 2% of the company's adjusted gross revenues be allocated to R&D with respect to mobile cellular technology and services. In 1991, a similar R&D condition of licence was applied to the regional telephone companies' five-year cellular special authorizations. This R&D condition of licence is currently incorporated in most long-term spectrum licences."

policy. Rather than compliance with an artificial R&D spending requirement, 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.

70. Finally, 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.

#### **Mandatory Roaming Condition of Licence**

71. In our reply comments to Question E above, TELUS noted that the application of increasingly stringent deployment requirements would help mitigate, though not eliminate, the arbitrage risk enabled by the Mandatory Roaming COL. In the following, we elaborate by differentiating the relationship between deployment requirements and mandatory roaming for both out-of-footprint (i.e., beyond a mobile network operator's claimed network coverage) and in-footprint (within their network coverage) scenarios.
72. In the out-of-footprint scenario, the presence of strict deployment requirements helps in mitigating opportunities for network arbitrage. Specifically, when deployment requirements are imposed, a spectrum licensee must provide *some form* of economic contribution towards facilities-based competition, either through direct investment in infrastructure that provides network facilities for expansion into previously unserved markets, or through the indirect support (via spectrum subordination) to a provider making the infrastructure investment in a surrogate role. While imposing deployment requirements does not completely eliminate the arbitrage and pricing risks described by Bell in their submission, in TELUS' view, the economic incentive to either build or subordinate helps in balancing an otherwise asymmetric position arising from the combination of mandatory out-of-footprint roaming and commercially negotiated rates subject to a mandatory dispute resolution mechanism.
73. On the other hand, in the in-footprint scenario, the introduction of strict deployment requirements is insufficient in addressing TELUS' concerns with mandatory roaming – an outcome which TELUS observes is taking place with alarmingly increasing frequency in

urban and suburban settings. Here, network arbitrage is the result of a decision to "under-deploy" (i.e., fail to continue infilling the network and deploying indoor and small cell coverage) within an operator's network footprint, while choosing to rely on artificially depressed rates (which arise, as Bell describes in Paragraph 24 of its comments, as the near-certain outcome of commercial negotiation turning to arbitration). The availability of roaming based on regulatory mandate, even for in-footprint regions, create adverse incentives to cause carriers to choose to obtain roaming rather than invest in infrastructure. In this scenario, deployment requirements (a blunt instrument) have typically been satisfied by the operator requesting roaming. As such, moving from Tier 2 to more stringent Tier 3 or Tier 4 requirements would not mitigate the arbitrage opportunity for in-footprint roaming. In TELUS' view, the only way to close this loophole is to eliminate the requirement for providing in-footprint roaming. Elimination of such a requirement is primarily justified by the demise of circumstances that drove its adoption. While mandatory roaming was originally conceived as a facilitator for new entrants nine years ago, all new entrants are now well-established regional players and have the ability to obtain roaming by way of CRTC tariff, meaning that the Department's rules with respect to mandatory roaming are unnecessary for them. In addition, these rules were never intended for incumbents to exploit; TELUS does not believe that the consequent reduction in facilities-based competition was an intended outcome of the Department's original and modified rules.

74. 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.
75. 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.

#### **Annual Reporting Condition of Licence**

76. With respect to the annual reporting COL, TELUS suggests that it be renamed the "Periodic Reporting" COL so as to give the Department the flexibility to both move to an ad hoc, as requested basis for periodic reporting and as deemed appropriate, reduce the level of reporting required at certain points in time versus others in a periodic reporting cycle. Bell, the CWTA, Québecor and Sasktel all make good suggestions with valid reasoning that TELUS sees no need to repeat here.

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