



TELUS COMMUNICATIONS COMPANY

Comments for

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

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Spectrum Management and Telecommunications

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Executive Summary

1. TELUS appreciates the opportunity to provide its comments.
2. TELUS generally supports the Department's proposed approach with some suggested modifications to ensure that the benefits of competition, investment and innovation are delivered to Canadians, in all regions of Canada, urban and rural, in a timely manner.
3. TELUS supports the proposed Licensing Framework with the following exceptions:

Residual 700 MHz Spectrum

- Remove the spectrum aggregation limits and maintain the 2014 opening bid levels; this spectrum has already failed to sell twice
- If the spectrum aggregation limits are maintained, the halving of the opening bids makes sense, but TELUS forecasts an incomplete sale for the third time

Residual 2500 MHz Spectrum

- This is the main product on offer (representing 60% of the MHz-pops proposed as part of this process and 92% when the dormant I Block spectrum is excluded) and the only band that is both mainstream and available beyond remote markets
- Bell, Rogers and SaskTel are grandfathered over the current spectrum aggregation limits by more than twice the amount as the residual 2500 MHz spectrum on offer
- Allow the rest of the industry to bid up to 60 MHz in these residual licence areas but do not allow Bell, Rogers and SaskTel to acquire further 2500 MHz spectrum over the current aggregation limits
- Increase the opening bid prices based on market values established in 2015
- Remove the residual 2500 MHz spectrum from the process and run an auction with price discovery suitable for a competitive process and with comprehensive package bidding

Residual 2300 MHz Spectrum

- Gross up in step with TELUS' proposed increases to 2500 MHz spectrum and then reduce these updated opening bid prices by one third to reflect the fact that mobile is restricted in 10 of the 30 MHz in each licence.

Residual PCS-G Block Spectrum

- TELUS supports all proposals related to PCS-G Block spectrum.

Residual I Block Spectrum

- TELUS recommends the I Block spectrum be removed from the process and held by the Department until a viable ecosystem emerges.

Residual FCFS PCS Spectrum

- Include all available FCS PCS spectrum licences at an opening bid price of \$0.16/MHz-pop in line with TELUS' proposed increases to residual 2500 MHz spectrum opening bid prices.

4. The detail behind TELUS' comments and recommendations in response to the various questions raised by the Department follow in the main body of this document.

TELUS' Comments on Specific Questions Posed by ISED

Q1.

ISED is seeking comments on the choice of licences being made available through this licensing process:

- a. are there other licences that should be made available in this licensing process; and
- b. are there any of these licences that should not be included in this licensing process?

Additional Spectrum to Include in this Process

5. TELUS suggests that any residual mobile spectrum that is not expected to have any significant competition over its acquisition be included in this near term sealed bid process.
6. The acquisition of spectrum is an economic decision based on a business case for its deployment. In this regard, TELUS notes that there are PCS licences available¹ for FCFS licensing that have continued to remain unlicensed. While there is no charge for the initial application for a FCFS PCS licence, these licences attract standard CMRS fees of roughly 3.5 cents per MHz-pop per annum. The net present value of these fees is in the range of \$0.50 - \$0.70 per MHz-pop over the term of a 20 year licence. Other spectrum in this process is being offered for a fraction of this net present value. TELUS suggests that the Department consider including the residual PCS licences available via FCFS as part of this auction at opening bid levels commensurate with other spectrum on offer and that this may attract purchasers.
7. Other than residual PCS spectrum, no other residual spectrum comes to mind that would be suitable for a near term sealed bid auction. A sealed bid process involves no price discovery and is only appropriate when little competition is expected.
8. For instance, this process should not include the AWS-3 Unpaired (1695-1710 MHz) and PCS-H Block spectrum. These bands are available nationally and are likely to attract

¹ As of the most recent publication of *Available Personal Communications Services (PCS) Spectrum in the 2 GHz Frequency Range (Canada Gazette DGSO-002-16)*, May 2016.

significant competition and therefore need an auction format that includes price discovery. Furthermore, these bands also require a consultation process to address licensing details and technical details for coordination, and in the case of 1695-1710 MHz, an update to the Canadian Table of Frequency Allocations (CTFA).

Spectrum to Exclude from this Process

9. TELUS anticipates that the residual 2500 MHz spectrum will attract sufficient competition to warrant its removal from this process, and should instead be sold via an auction format that includes price discovery. The residual 2500 MHz spectrum is the main product on offer (representing 92% of the MHz-pops proposed in this process when dormant I Block spectrum is excluded) and is the only band that is both mainstream and available beyond remote markets. TELUS expands on this recommendation in our responses to Questions 2, 4 and 5 in which TELUS contends that the competitive measures for the residual 2500 MHz spectrum should be modified, that the sealed bid format is not appropriate and that the proposed package bidding is too limited.
10. TELUS also recommends that the Department exclude I Block spectrum from this residual auction process. In our reply comments to the Department's *Consultation on a Licence Renewal Process for Advanced Wireless Services and Other Spectrum* (SLPB-002-17), we suggest that the I Block licences are highly unlikely to be renewed, as the lack of available equipment in the band almost certainly means that licensees will be in breach of their deployment requirement conditions of licence (COL). As such, TELUS expects that all I Block licences will be returned to the Department shortly after their expiry in late 2018 – early 2019. In our reply comments to the Renewal Consultation and here, we recommend that the Department hold the unsold and to be returned I Block licences until an industry direction becomes clearer and an equipment ecosystem emerges. At that point in time, the Department could issue a public consultation for the I Block spectrum, determining (amongst other things) a suitable set of deployment requirements and whether a competitive licensing process would be appropriate for its award.
11. TELUS supports the inclusion in the process of the 700 MHz, PCS-G Block, and 2300 MHz spectrum as proposed.

Q2.

ISED is seeking comments on its proposals to:

- a. maintain the spectrum aggregation limits on the 700 MHz licences;
- b. maintain the spectrum aggregation limits on the 2500 MHz licences including newly available 2585-2595 MHz licences; and
- c. not impose competitive measures on other licences issued through this licensing process

12. TELUS suggests that since this is an auction of returned and unpurchased spectrum, in some cases following two separate failed attempts to sell it at auction, that competitive measures are not warranted. The only exception to this is the residual 2500 MHz spectrum where TELUS recommends modified aggregation limits, although TELUS also recommends removing this spectrum from this process.

Remove 700 MHz Spectrum Aggregation Limits in North

13. This is the third time ISED will attempt to sell the 700 MHz spectrum in the north. In an effort to find one or more buyers this time, the Department is proposing to break the residual Tier 2 licence into its constituent three Tier 4 service area licences, allocate the original opening bid amount on a population weighted basis to each Tier 4 licence and then reduce these opening bid amounts by half. While this may serve to achieve the sale of one of the Tier 4 licences, in TELUS' view it is unlikely to result in the sale of all residual 700 MHz licences. TELUS recommends that ISED remove the aggregation limits for the residual 700 MHz spectrum being auctioned.
14. The competitive measures for the northern licence in the both the original 700 MHz auction in 2014 and the residual auction in 2015 did not result in the licensing of the spectrum. TELUS recommends that the same treatment be afforded the unsold northern 700 MHz spectrum as the unsold AWS-3 spectrum in the 2015 residual auction. The Department should remove the spectrum aggregation limits on the 700 MHz spectrum for the northern licences.

15. TELUS notes that in the original 2500 MHz auction, the Department applied an exception to the northern licences. The northern 2500 MHz licences were the only uncapped licences in the 2500 MHz auction.
16. In each of the last four auctions, spectrum went unsold in the northern licence areas leaving at least 30 MHz still unassigned in every northern licence area – 10 MHz of 700 MHz band spectrum and more than 20 MHz of 2500 MHz band spectrum (20 MHz in Nunavut and the Northwest Territories and 30 MHz in the Yukon). TELUS believes that this is clear evidence of the lack of need to maintain spectrum aggregation limits on the 700 MHz spectrum for the northern licences.

Modify 2500 MHz Spectrum Aggregation Limits

17. Rogers and Bell were each grandfathered with 65 MHz of 2500 MHz spectrum in all major markets (61% of the country by population) as was SaskTel in its entire operating territory. In other words Bell, Rogers and SaskTel are cumulatively grandfathered holdings above the current spectrum aggregation limit of more than twice as much 2500 MHz spectrum (some 538M MHz-pops) as there is residual 2500 MHz spectrum for sale in this process (some 255M MHz-pops). In this second chance to acquire 2500 MHz spectrum, after which all prospective bidders have had a chance to bid the first time but spectrum was left unsold due to the aggregation limits, bidders other than Bell, Rogers and SaskTel should have a chance to also acquire 2500 MHz spectrum over the current 40 MHz aggregation limits. That is, the current 2500 MHz spectrum aggregation limits should continue to apply to Bell, Rogers and SaskTel during this residual auction process in recognition of their significant 2500 MHz holdings above the aggregation limits. The 2500 MHz spectrum aggregation limits should be increased to 60 MHz (excluding the restricted bands at 2570-2575 MHz and 2615-2620 MHz) for all interested parties aside from Bell, Rogers and SaskTel. TELUS and all bidders should be able to acquire more 2500 MHz spectrum given that Bell, Rogers and SaskTel each have 65 MHz in all or the majority of the top markets within their operating territory.

No 2300 MHz, PCS-G Block and I Block Spectrum Aggregation Limits as Proposed

18. TELUS supports the proposal to not implement any competitive measures for the balance of the spectrum on offer in this process (i.e., 2300 MHz, PCS-G Block and I Block, if the Department chooses to include it in this auction process).
19. In summary, TELUS proposes that the residual I Block and 2500 MHz spectrum be removed from this process and all FCFS PCS spectrum be included and that competitive measures for the remaining spectrum are neither required nor beneficial.
20. In a separate process involving a multi-round auction format, TELUS recommends a competitive measure to restrict Bell, Rogers and SaskTel from bidding on the any residual 2500 MHz spectrum on offer and the application of a 60 MHz aggregation limit to all other bidders for the reasons detailed above.

Q3.

ISED is seeking comments on:

- a. the likely timeframe for availability of equipment capable of providing access to licensed spectrum on an opportunistic basis;
- b. licence terms;
- c. the proposal to apply deployment levels to each of the licences as described in annex F; and
- d. the proposed conditions of licence as outlined in annexes A through F

Opportunistic Access

21. 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.
22. 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.

23. 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.
24. The limited adoption of TVWS (TV White Space) technologies serves as an example of the ramifications of introducing immature technologies with underdeveloped ecosystems.
25. 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.
26. 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.
27. 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.

28. TELUS notes that all respondents to the recently completed *Consultation on a Renewal Process for Advanced Wireless Services and other Spectrum* 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.

Licence Terms

29. TELUS supports the proposed licence terms and the rationale for a shorter term for the I Block spectrum as detailed in TELUS' recent submissions to SLPB-002-17, if the Department chooses to include it in this auction process.

Deployment Requirements

30. With the exception of the I Block for which we support the proposed eight year requirements (despite also recommending that the I Block not be auctioned at this time), TELUS believes that the proposed deployment requirements are too weak.
31. TELUS notes that it recommended the required deployment timelines be accelerated in its responses to the original licensing framework consultations associated with each of these bands in this process.
32. Given that TELUS' recommendations to accelerate the timelines associated with the subject bands in the original licensing framework consultations were not adopted, TELUS suggests that it would presumably be unfair to accelerate the timelines for residual licensees. However, TELUS believes it would not be unfair to review and, as can be justified, modestly increase the required percentages.
33. TELUS notes that it appears that the Department has modestly increased the deployment requirement percentages for select licences in the 2300 MHz, PCS-G Block and I Block spectrum bands despite reporting in Paragraph 24 that they are the same as the original licensing framework percentages. TELUS supports these changes but would expect some parties to argue against the changes based on the rural nature of the subject licence areas.

Conditions of Licence

34. TELUS supports the majority of the proposed conditions of licence outlined in Annexes A through F of the consultation, with the following exceptions, consistent with TELUS' recent submissions to SLPB-002-17. TELUS strongly advocates that the Department eliminate the R&D COL. With respect to the mandatory roaming COL, TELUS proposes 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. TELUS advocates for change to reduce the administrative burden of annual reporting.

R&D Condition of Licence

35. The research and development (R&D) condition of licence, included² in all or most mobile spectrum licences since 1991, has run its course and Bell, CWTA, Eastlink, Rogers, Québecor, Sasktel and Shaw have all recently called for its removal entirely along with TELUS.
36. 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.
37. TELUS highlights Bell's recent comments on this issue. Bell has 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

² *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."

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.”

38. 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 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.
39. 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

40. TELUS notes that the application of stringent deployment requirements helps mitigate, though not eliminate, the risk of network arbitrage (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) that is 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.
41. 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 arbitrage and pricing risks, 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.

42. 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 has recently described, 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, more stringent deployment requirements do 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.

43. 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.

44. 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

45. 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.

Spectrum Aggregation Limits Condition of Licence

46. TELUS recommends changes to the spectrum aggregation limits as proposed in TELUS' response to Question 2 above.

Q4.

ISED is seeking comments on its proposals:

- a. to use the sealed-bid auction format for the auction of residual licences, and
- b. on the timelines set out in the *Proposed Table of Key Dates*.

Sealed Bid Auction Format

- 47. The sealed bid auction format is appropriate and efficient for the auction of residual 700 MHz, PCS-G and I Block spectrum (should it be included) due to the limited forecasted competition for these blocks.
- 48. The sealed bid auction format is not appropriate for residual 2500 MHz band licences as the residual 2500 MHz spectrum comprises 255M MHz-pops of prime mobile spectrum across 62 licences and as proposed requires package bidding. Based on TELUS' recommended adjustment to the competitive measures, an auction of the residual 2500 MHz spectrum (92% of the residual spectrum by MHz-pops in this auction after the I Block is excluded) will be competitive and require price discovery. A sealed bid process is not appropriate for the residual 2500 MHz spectrum.

Proposed Table of Key Dates

- 49. TELUS appreciates the Department's efforts in making this spectrum available in a timely manner and supports the timelines set out in the proposed table of key dates.

Q5.

ISED is seeking comments on its proposals to include package bidding for 2500 MHz licences in the sealed bid auction format.

- 50. TELUS commends the Department for proposing a form of package bidding to attempt to limit the exposure risk in bidding for so many Tier 3 licences as part of this proposed one round process. However, TELUS is concerned that the predetermined groupings fail to

address any exposure risk across larger regions and also fail to address exposure risk across FDD and TDD frequency blocks in the same region.

51. TELUS contends that the purpose of package bidding is to allow bidders to self-manage their exposure risk across the entirety of their target licence sets and that the proposed limited package bidding does not accomplish this purpose.
52. For this reason, as well as because TELUS recommends a multi-round process that provides bidders with price discovery, TELUS recommends the removal of the 2500 MHz spectrum from this process. TELUS recommends a separate multi-round auction of 2500 MHz spectrum with comprehensive (i.e., bidder defined) package bidding.

Q6.

ISED is seeking comments on its proposal to use a second-price rule for this auction and the Vickrey price determination mechanism.

53. TELUS supports the proposal to use a second-price rule for this auction and the Vickrey price determination mechanism.
54. However, the sealed bid auction format only makes sense when there is little competition and hence, often the second price is the reserve price. Therefore the opening bids need to be at a level commensurate with market value. This is the context for TELUS' comments in the next question on opening bid (reserve price) levels.

Q7.

ISED is seeking comments on the proposed opening bids as presented in tables 7, 8, 9 and 10.

Proposed 700 MHz Opening Bids per Table 7 of the Consultation

55. TELUS supports the proposed reduced opening bids for the residual 700 MHz spectrum if the Department follows through as proposed to maintain the 700 MHz spectrum aggregation limits. TELUS however has recommended in its response to Question 2 that the Department remove the 700 MHz spectrum aggregation limits. Should the Department remove the 700 MHz spectrum aggregation limits, TELUS would recommend that the Department maintain the opening bids used in the previous two auctions for this spectrum.

Proposed 2500 MHz Opening Bids per Table 8 of the Consultation

56. TELUS has recommended that the Department exclude the residual 2500 MHz spectrum from this process as detailed in TELUS' responses to Questions 1, 2, 4, and 5. TELUS is opposed to the proposed opening bids for the residual 2500 MHz spectrum if the Department decides to include this spectrum in the process without modifying the spectrum aggregation limits. The reuse of the original 2500 MHz opening bid prices (which were determined after consultation for inclusion in a multi-round auction with significant competition and price discovery) would not be appropriate in this context.
57. If the Department auctions the residual 2500 MHz spectrum in this process and as proposed (which would result in little or very limited competition for these licences), then TELUS recommends that the opening bid prices be recalculated based on the actual market value in the Canadian context established in the 2015 auction of liberated and unassigned 2500 MHz spectrum. TELUS recognizes that determining the actual price of individual licences purchased as part of a package and where a second-price rule and Vickrey price determination mechanism were used is not possible. However, the general range of pricing can be easily estimated using simplifying assumptions.

58. In the 2015 auction and in the proposed residual auction of 2500 MHz spectrum, the Department employs a pricing mechanism for service areas based on the presence and size of a Statistics Canada census metropolitan area (CMA) within each service area. These four prices can be mapped to relative weights (compared to the base price of \$0.051/MHz-pop) as shown in Table 1.
59. TELUS proposes the following revised methodology to calculate opening bid prices for the 2500 MHz licences in the residual auction, based on the final results³ of the 2015 auction:
- Calculate the weighted MHz-pop (“wMHz-pop”) for each licence sold:
 $wMHz\text{-pop} = Licence\ bandwidth * service\ area\ population * relative\ weight$,
 using the relative weights found in Table 1 (as determined by ISED).
 - Determine the sum of wMHz-pop from the 2015 auction: 4,870,229,520 wMHz-pop
 - Calculate the average base price in \$/wMHz-pop that applies to service areas with relative weight of 1.00: $\$755,371,001 / 4,870,229,520\ wMHz\text{-pop} = \0.16
 - Apply the relative weights to scale up the proposed price according to each service area’s relative weight, as shown in Table A.

Table A: Relative Pricing by Service Area

2015 Auction: Opening Bid Price (\$/MHz-pop)	Relative Weight	Proposal for Residual Auction: Opening Bid Price (\$/MHz-pop)
0.051	1.00	0.16
0.065	1.27	0.20
0.100	1.96	0.30
0.140	2.75	0.43

Proposed 2300 MHz Opening Bids per Table 9 of the Consultation

60. TELUS supports the proposed significant increase in opening bids for the 2300 MHz spectrum due to the fact the technical restrictions have been removed and a modest ecosystem has developed. TELUS views the proposed increases as insufficient and suggests they be increased further in line with TELUS’ recommendation for increases for the residual 2500 MHz spectrum (if the Department in fact includes the residual 2500 MHz spectrum in

³ 2500 MHz Auction – Final Results. Link: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11030.html>

this process). As such, TELUS recommends that the opening bids for the four residual 2300 MHz licences be set at \$0.16 / MHz-pop.

61. However, TELUS recommends that the Department reduce the proposed opening bids by a factor of one third to reflect the fact that only 20 MHz of the 30 MHz blocks is available for unrestricted⁴ mobile use; the spectrum in 2315-2320 MHz and 2345-2350 MHz should be treated like the restricted blocks in the 2500 MHz band and not attributed to the bandwidth of the licence in calculating the 2300 MHz opening bids.
62. The combination of TELUS' two recommendations for modifying opening bids in the 2300 MHz band is shown in Table B.

Table B: Proposed opening bid prices for the 2300 MHz (WCS) licences

Tier	Service Area Name	Population	\$/MHz-pop (Consultation)	Opening Bid (Consultation, 30 MHz)	\$/MHz-pop (Proposed)	Opening Bid (Proposed, 20 MHz)
4-065	Port-Cartier/Sept-Îles	47,167	0.051	\$72,000	0.16	\$146,000
4-092	Sarnia* (4-092-002)	104,487	0.051	\$160,000	0.16	\$324,000
4-119	Estevan	45,956	0.051	\$70,000	0.16	\$143,000
4-171	Nunavut	29,597	0.051	\$45,000	0.16	\$92,000

Proposed PCS-G Block and I Block Opening Bids per Table 10 of the Consultation

63. TELUS supports the proposed opening bids for the PCS-G Block spectrum. TELUS supports the proposed opening bids for the I Block spectrum if the Department chooses to include it in this auction process.

Proposed PCS FCFS Opening Bids

64. In our answer to Q1a, TELUS suggested that it would be appropriate to consider including the PCS licences available for FCFS licensing that have continued to remain unlicensed in this auction process.

⁴ "Mobile and portable equipment are prohibited from transmitting in the bands 2315-2320 MHz and 2345-2350 MHz," per Section 5.2 in RSS-195 – *Wireless Communication Service (WCS) Equipment Operating in the Bands 2305-2320 MHz and 2345-2360 MHz*, April 2014.

65. The PCS band (excluding the PCS-G Block) is a mainstream band with a robust ecosystem. TELUS recommends that opening bids for the set of PCS licences currently available for FCFS licensing be set commensurate with other mainstream spectrum bands proposed for auction in this process. Given that the available service areas for FCFS licences are typically rural in nature, TELUS suggests that \$0.16/MHz-pop (the price proposed by TELUS above to apply to service areas that do not provide coverage to a Census Metropolitan Area (CMA) in the 2300 MHz and 2500 MHz bands) is an appropriate price to use in determining opening bids for these licences.

Q8.

ISED is seeking comments on its proposed rules regarding Affiliated and Associated Entities, which would apply to applicants and bidders in the upcoming auction of residual spectrum licences.

66. TELUS supports the proposed rules regarding Affiliated and Associated Entities, which would apply to applicants and bidders in the upcoming auction of residual spectrum licences.

Q9.

ISED is seeking comments on the rules prohibiting collusion and other communication rules, which would apply to bidders in the upcoming auction of residual spectrum licences.

67. TELUS supports the rules prohibiting collusion and other communication rules, which would apply to bidders in the upcoming auction of residual spectrum licences.

Q10.

ISED is seeking comments on:

- a. the proposed auction process for the auction of residual licences;
- b. the proposed use of Canada Post's ePost Connect services for auction applications, associated documentation and bid forms; and
- c. section 8.12, the proposal to auction some or all of the frequency bands separately. Please include any preferences on the order of the bands.

Auction Process

68. Other than for the residual 2500 MHz spectrum, TELUS supports the proposed auction process for the auction of residual licences.
69. As detailed previously in these comments in response to Questions 1, 2, 4 and 5, TELUS expects that the 2500 MHz spectrum is a subset of the proposed spectrum that will attract significant competition and should be removed from this process and sold via an auction format that includes price discovery. TELUS recommends that the competitive measures for the 2500 MHz spectrum in the process be modified, that the sealed bid format is not appropriate and that the proposed package bidding is too limited.

Use of ePost Connect

70. TELUS supports the use of Canada Post's ePost Connect services for auction applications, associated documentation and bid forms.

Order of Bands

71. On the basis that the Department excludes the residual 2500 MHz spectrum and the residual I Block spectrum from this process while also including any currently available FCFS PCS spectrum as TELUS has recommended, then there are four discrete auctions to complete via sealed bid – a residual 700 MHz auction, a residual 2300 MHz auction, a residual PCS-G Block auction and an available FCFS PCS spectrum auction. TELUS has no preference for the order of the bands and in fact would prefer to bid on all bands at once. However, if other

respondents have a preference for sequential auctions, TELUS would not object and further notes that four sealed bid auctions could be completed over six hours in one day with two hour decision making periods between rounds.

Q11.

ISED is seeking comments on the proposed renewal process.

72. TELUS supports the proposed renewal process. TELUS notes that several of the bands proposed for inclusion in this residual auction process have recently been auctioned or are currently being considered for renewal. TELUS recommends that the licences issued following the residual auction be assessed for renewal as part of the same renewal consultation as the mainstream tranche of licences in each band despite the difference in expiry dates.

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