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**Re: Canada Gazette Notice No. SLPB-005-17 — Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band**

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Attached, please find the comments of Rogers Communications Canada Inc. (Rogers) in response to *Canada Gazette*, Part I, August 19, 2017, *Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band* (SLPB-005-17).

Rogers thanks the Department for the opportunity to provide input on this important issue.

Yours very truly,

A handwritten signature in black ink that reads 'Howard Slawner'.

Howard Slawner  
Vice President – Regulatory Telecom  
HS/pg

Attach.

Consultation on a Technical, Policy and  
Licensing Framework for Spectrum  
in the 600 MHz Band  
SLPB-005-17

Comments of  
Rogers Communications Canada Inc.  
October 2, 2017



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## Executive Summary

- E1. The 600 MHz auction is an opportunity for the Department to foster both innovation and competition. Providing access to additional low-band mobile spectrum will allow providers to increase network coverage and capacity while supporting the deployment of advanced next-generation wireless technologies. Canadians already use their mobile devices far more than users in most other countries. This trend will continue with the ongoing deployment of advanced 4th generation (4G) Long Term Evolution (LTE) wireless networks and increase even more with the arrival of 5th generation (5G) technology, which has the potential to revolutionize how we work, study and play. 600 MHz spectrum will both address Canada's almost insatiable demand for data capacity while acting as a key building block for the next advancement in wireless technology.
- E2. The auction is also an opportunity to re-set the competitive landscape. Over the last 10 years, the new entrants have evolved from multiple, often under-financed, start-ups in each region to a single established communications conglomerate in each region. Shaw, Videotron, and Eastlink have the customer base, knowledge, facilities and access to capital to compete vigorously with the three national carriers. They no longer require any further subsidies from the Canadian taxpayer. Videotron and Shaw have already made hundreds of millions of dollars of profit by simply flipping licences. Other jurisdictions, such as the U.K. and Denmark, have used set-asides to introduce new competition and then subsequently allowed the new carriers to compete on their own. It is time ISED took the same approach and discontinued unnecessary set-asides.
- E3. Rather than simply protecting the regional carriers, who are all large, diversified communications companies that do not require any protection, ISED should re-focus its attention to the state of competition in the marketplace as a whole, especially between the three national carriers. The continued use of set-asides and caps have favoured Bell and Telus. Through their joint network, they are able to mitigate the impact of ISED's spectrum aggregation limits by combining their spectrum into a single network. ISED's efforts to assist the new entrants have unintentionally assisted two of the largest carriers in Canada. The playing field must be re-balanced to foster sustainable competition.
- E4. If ISED persists with a set-aside, it must be reduced from 30 MHz to 20 MHz. There is no technical or business reason for a 30 MHz set-aside. From a network perspective, 20 MHz provides the necessary aggregation for low band spectrum to deliver the necessary capacity and speed efficiently. An extra 10 MHz is additive but unnecessary. If a regional carrier eligible for the set-aside is interested in more than 20 MHz, they can compete for the additional 10 MHz block amongst the open lots and still enjoy an implicit subsidy on the set-aside.

- E5. Moreover, a 30 MHz set-aside all but insures a poor outcome of the auction. It only leaves 40 MHz for the three national carriers, scarcely more than half of the available spectrum for carriers serving in total 90% of customers. At best, one carrier will win two blocks while the two remaining carriers win one block each. Under the proposed rules however, there is a real likelihood that only two carriers, or perhaps just one, will win all the spectrum. If ISED is committed to four carriers in each market, then such an outcome runs completely counter to its stated goals. Unless every carrier has a realistic opportunity to obtain this valuable resource and no bidder is able to corner the available spectrum to impede competition, the introduction of next generation wireless services could be hindered.
- E6. For that reason, if ISED institutes a set-aside, it should adopt a 20 MHz cap along with it. While Rogers acknowledges that it has historically opposed all spectrum aggregation limits, this auction requires a cap if a set-aside is present. Without one, it is very possible that the 600 MHz spectrum will end up concentrated in the hands of a few. Network sharing partners can use their combined balance sheets to great effect. Without a cap, joint bidding could facilitate bids aimed at excluding other carriers from the open lots. Only a 20 MHz cap, together with a 20 MHz set-aside, will result in an outcome that will empower every carrier and hasten the adoption of 5G in line with the competition objectives that ISED has itself set out.
- E7. Furthermore, without a cap, the associated entity and collusion rules have little consequence. With no caps whatsoever, bidders can freely be designated associated entities with no restriction on the total amount of spectrum they can win. The integrity and competitiveness of the auction therefore necessitates a 20 MHz cap.
- E8. ISED should also consider more simplified auction formats. The combinatorial clock auction (“CCA”) has been steadily falling out of favour due to its complexity. It has often resulted in very high prices and asymmetrical results with some bidders having to pay far more than other bidders with similar licences. It is also too easily subject to spiteful bidding meant to drive up opponent prices rather than obtain the licence itself, with consequent risks to the auction outcome.
- E9. The combination of a CCA and no caps is highly concerning, as winning prices could be determined by losing bids made with the aim of excluding other carriers and distorting competition. The CCA without caps strongly encourages bidders to try such exclusionary bidding. Even if a bidder bids for many lots to exclude others but is unsuccessful – ultimately winning fewer lots – this strategy does not lead to that bidder paying more due to the opportunity cost pricing rules; however, other winners may pay much more due to such losing anti-competitive bids. Therefore, a CCA without caps risks winners paying far in excess of a fair and reasonable market price for spectrum.

- E10. ISED should therefore consider returning to a simultaneous multi-round auction (“SMRA”) or simple clock auction format. With generic licences and Tier 2 licence areas, there is little danger of aggregation risk, the avoidance of which is the primary advantage of a CCA. An SMRA or clock auction would simplify the auction and moderate prices by avoiding the worst aspects of the CCA format, specifically spiteful bidding. As a result, less capital would be diverted from spending on expanding networks and deploying new technology across Canada, which is where money should be spent. Any policy that increases spectrum prices ultimately hurts the Government of Canada’s efforts to make telecommunication services more affordable for low-income Canadians.
- E11. If ISED does continue with a CCA, of the three variants proposed, it should use Generalized Axiom of Revealed Preference (“GARP”). It provides the best combination of flexibility and restrictiveness, allowing for price discovery while holding bidders to their valuations. The Weak Axiom of Revealed Preference (“WARP”) rules have proven too open to abuse in past auctions.
- E12. ECCA is simply not an appropriate pricing mechanism as it drives prices above the level needed to achieve efficient allocation of the spectrum. It assumes opposing bidders make implicit spiteful bids even when they have not. Such an emphasis of revenue raising above a fair and reasonable market price does not achieve ISED’s goals to foster an advanced and competitive communications system, with consumers ultimately paying for this excess revenue in terms of higher prices.
- E13. The ECCA has been proposed on the basis that it improves price transparency during the open phase of the CCA. However, if this is a concern, we fail to see why ISED has not considered much simpler auction formats (such as the SMRA and clock auction) which have a simple ‘pay as bid’ structure where winners pay the amount of their bids. This would avoid the difficulty with the CCA that clock prices may poorly reflect winning prices.
- E14. No matter which variant is selected, ISED must implement “fair bidding” rules if it has adopted a set-aside. In the AWS-1 auction, set-aside-eligible bidders repeatedly parked eligibility points in the open blocks, maintaining their own eligibility while driving up the prices of the three national carriers. Under the proposed activity rules (both WARP and GARP) there are clear incentives for set-aside-eligible bidders to bid for open lots to slacken constraints on their future bids. Unless checked, such behaviour can be expected in this auction. ISED should therefore require that set-aside-eligible bidders be made to bid on the set-aside blocks whenever the set-aside blocks are cheaper than the open blocks. This can be easily implemented and avoids fundamental gaming of the auction; it would also greatly simplify the price increment rules.

- E15. If Canada is to become an innovation leader, ISED must take a holistic approach to 5G. Access to spectrum is essential but equally important is access to infrastructure. ISED must work with the Canadian Radio-television and Telecommunications Commission (CRTC) and all levels of government to ensure carriers have access to the poles (hydro and telecom), ducts, streetlights, and municipal property that are needed to place antennas and wires. Backhaul will be crucial to 5G and carriers must be able to deploy the necessary trunks and dishes.
- E16. Finally, the 600 MHz auction is an opportunity to assist over-the-air television broadcasters. Having already been forced to bear significant costs to transition from analog to digital technology, which have not been fully depreciated, they must now move to new frequencies incurring significant expense. ISED must ensure these broadcasters have the time and financial resources to complete this transition while maintaining the same level of service they have always provided Canadians.

## Introduction

1. Rogers Communications Canada Inc. (“Rogers”) is pleased to provide Innovation, Science and Economic Development Canada (“ISED” or “the Department”) with the following comments in response to *SLPB-005-17: Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band*<sup>1</sup> (the Consultation), published in the *Canada Gazette*, Part I, August 19, 2017.
2. The 600 MHz auction is an opportunity for the Department to foster both innovation and competition. Providing access to additional mobile spectrum will allow providers to increase network capacity while supporting the deployment of advanced next-generation wireless technologies. Low band spectrum, such as the 600 MHz spectrum, is particularly important as its propagation qualities will allow for ubiquitous coverage, covering long distances in rural regions, and better penetrating buildings in urban areas.
3. Access to new spectrum is timely, as it will help Canadian network operators meet the increasing demand for data and deliver innovative new services. Canadians already use their mobile devices far more than users in most other countries. Canada's mobile data traffic grew 41% in 2016, and is expected to grow five-fold from 2015 to 2020, a compound annual growth rate of 36%.<sup>2</sup> This trend will continue with the ongoing deployment of advanced 4G LTE wireless networks and significantly increase with the advent of 5G networks. Dramatic growth in demand for mobile data services will also be fuelled by Canadian consumers and businesses embracing the Internet of Things, with Cisco predicting a Machine-to-Machine compound annual growth rate of 77%.<sup>3</sup>
4. As a large, nationwide wireless operator focused on the provision of advanced new broadband services, including capacity-hungry streaming video services such as Rogers NHL LIVE and 4K television, Rogers knows that operators require additional capacity to keep pace with Canadians’ demand for mobile data services. In order to address this dramatic growth, Rogers has already made significant investments to deploy LTE mobile broadband technology to approximately 95% of the Canadian population.<sup>4</sup> Rogers was the first to deploy LTE in Canada and continues to deliver innovative broadband services through the trialing and deployment of new technologies such as carrier aggregation of licensed spectrum bands, 256-QAM transmission, and Licence-Assisted Access LTE (LTE-LAA). Such innovation is vital

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<sup>1</sup> ISED, *SLPB-005-17: Consultation on a Technical, Policy and Licensing Framework for Spectrum in the 600 MHz Band* (Consultation); <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11316.html>.

<sup>2</sup> Cisco, *VNI Mobile Forecast Highlights, 2016-2021*;

[http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast\\_highlights\\_mobile/index.html#~Country](http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country).

<sup>3</sup> Ibid.

<sup>4</sup> Rogers, *Rogers Communications Reports First Quarter 2017 Results*, April 2017.



on the march to 5G and new services, such as augmented and virtual reality and autonomous vehicles and manufacturing.

5. The 600 MHz auction can also play an important role in updating and refocusing ISED's competition policies. Rogers agrees with the Department that competition in the mobile wireless marketplace is vitally important to deliver benefits to consumers. However, overly favouring the interests of just one competitor is not the same as promoting competition. As the Department states, both new competitors and national service providers would benefit from access to additional spectrum.<sup>5</sup> The objective of the 600 MHz auction policy should be to guarantee sufficiently intense competition in the market, which means ensuring a sufficient number of winners with a reasonably balanced division of the band.

### **Set-Asides and Spectrum Caps**

6. After four auctions with highly advantageous rules for some participants, spectrum set-asides are no longer necessary. For the last ten years, ISED has successfully focused on introducing and maintaining new wireless carriers. Today, there is a strong fourth operator in each region of Canada. No longer made up of stand-alone wireless start-ups, they are all now part of established, diverse telecommunications companies with strong balance sheets that do not need taxpayer subsidies. They all possess spectrum portfolios that include low, mid, and high mobile spectrum bands. These spectrum portfolios provide the fourth carriers with a very high MHz-per-customer ratio and they do not face the same spectrum, capacity, and coverage constraints that national carriers do. Therefore, Shaw, Videotron, and Eastlink, some of Canada's largest communications conglomerates, no longer need any public support obtaining spectrum, let alone indirect subsidies worth hundreds of millions of dollars.
7. However, should the Department be committed to provide a fifth set-aside for these strong competitors, the set-aside should be reduced from 30 MHz to 20 MHz. There is no technical or economic reason to fix the set-aside at 30 MHz. From a network perspective, a 10+10 block provides the necessary aggregation to deliver the needed capacity and performance to support a strong fourth operator. The additional 10 MHz is additive but not a necessity to achieve economic coverage with low band spectrum. If a non-national carrier wanted 30 MHz, this is not precluded by a 20 MHz set-aside, as it would in any case receive an implicit subsidy of the set-aside and have the financial and commercial capacity to compete for an additional 10 MHz open block. Moreover, a 30 MHz set-aside leaves only 57% of spectrum available to the three national carriers serving 90% of Canadians.
8. Providing the non-national carriers with unjustifiably large set-asides will simply be a windfall for them paid for by the public. As seen in the AWS-1, 700 MHz and 2500

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<sup>5</sup> ISED, *Consultation*, para 18.

MHz auctions, set-aside-eligible bidders have been able to take advantage of the auction rules to secure spectrum (that they did not actually require) at reduced prices and re-sell the spectrum to other bidders for their own financial benefit. Due to the auction rules in place reserving spectrum for the new entrants, Videotron paid only \$420 million for its 700 MHz and 2500 MHz spectrum but then sold all the spectrum it obtained outside its footprint (i.e. outside of Quebec and Eastern Ontario) for \$430 million. Effectively, Videotron was given 30-50 MHz of free spectrum in its operating territory plus an additional \$10 million in cash, courtesy of Canadian taxpayers. This has not helped competition or affordability for Canadian consumers, in fact, it has done the opposite. It has also delayed the deployment of spectrum in a number of regions, negatively impacting the mobile wireless services to Canadians living in the affected service areas.

9. In order to maintain and stimulate competition in the wireless industry, ISED must begin refocusing its competition policies from purely creating opportunities for subsidised access to spectrum for new entrants to fostering fair and effective competition between the three national carriers. As described above, ISED has already successfully introduced a fourth carrier in every market in Canada. However, in fostering this new competition, ISED's efforts also had the unintended consequence of skewing the competitive landscape between the three national carriers. The Bell-Telus joint network, combined with auction rules that allow strategic partners to bid independently then combine spectrum after the auction, have disrupted an essential competitive dynamic of the Canadian marketplace. The three national carriers together serve about 90% of the market and any distortion of competition between them ultimately hurts customers. It is essential the 600 MHz auction treat all carriers, and their associated networks, equally.
10. This is another reason why it is essential that the set-aside either be eliminated or, at a minimum, be reduced from 30 MHz to 20 MHz. If there is only 40 MHz of spectrum open to all bidders, a likely outcome is that Bell and Telus together obtain 30 MHz, if not all 40 MHz, for their single network. That would leave Rogers with 10 MHz or nothing, providing the Bell-Telus network with an unacceptable advantage in terms of holdings of sub-1 GHz spectrum relative to other national and regional networks. There must be sufficient spectrum openly available to allow all networks to obtain the needed 10+10 MHz to economically deploy and benefit from the 600 MHz spectrum.
11. In addition, ISED must also introduce a spectrum cap, so as to ensure broad access to the 600 MHz spectrum. While Rogers recognizes that it has opposed spectrum aggregation limits in the past, they have become necessary in the face of the Bell-Telus joint network. If ISED remains committed to a set-aside of any size in order to achieve their four-carrier policy goal, it should also implement a 20 MHz cap, or possibly 30 MHz for new entrants. This will, at the minimum, ensure all three

national networks obtain at least some spectrum and that ISED's objective for competition is met.

12. Furthermore, without a cap, the associated entity and collusion rules are ineffectual. Over the last several auctions, Rogers believes these rules failed to prevent auction participants from coordinating their bidding. Carriers have repeatedly been able to align their bids during the auctions, despite the associated entity and collusion rules, in order to combine and share their spectrum afterwards. The same bidding patterns have been witnessed over and over again. This occurred even when there were caps. Removing the caps altogether will allow network sharing partners to bid as a single entity, coordinating perfectly and using their combined weight to outbid their competitors. A 20 MHz cap is therefore essential if competitive integrity is to be maintained.
13. Along with the 20 MHz cap, ISED must take further measures. Firstly, the associated entity rules must be broader. They should not be based upon any agreement to specifically use the 600 MHz spectrum but should take into consideration current network sharing arrangements. Carriers already sharing networks will, almost assuredly, share future spectrum as well and the associated entity rules should reflect this. Secondly, if carriers wish to share the 600 MHz spectrum after the auction is complete, they should not be allowed to combine more than 30 MHz. This can be accomplished either through a secondary cap or by preventing transfers, including subordinate licences, after the auction. Any surplus held over the 30 MHz would be returned to ISED. These steps will equalize bidding power and reduce the incentive to coordinate during the auction
14. Table 1 below looks at potential outcomes of various pro-competitive measures and their impacts on the Canadian mobile wireless market.

**Table 1: Potential Outcomes of Various Pro-Competitive Measures**

	<b>3-Block Set-Aside (4 open lots)</b>	<b>2-Block Set-Aside (5 open lots)</b>
<b>No Cap</b>	<p><i>Proposal in the consultation document</i></p> <ul style="list-style-type: none"> <li>• Worst case outcome of 2 winners (4+<u>3</u>) with all open lots going to a single winner strongly incompatible with ISED’s competition objective</li> <li>• Bell/Telus joint bid vehicle could obtain all the open lots</li> <li>• Likely outcome (2+1+1+<u>3</u>) gives one national player a spectrum advantage, especially if Bell and Telus spectrum share (essentially a 3+1+<u>3</u> outcome where one national player cannot effectively compete)</li> </ul>	<ul style="list-style-type: none"> <li>• Worst case outcome of 2 winners (5+<u>2</u>) with all open lots going to a single winner strongly incompatible with ISED’s competition objective</li> <li>• Bell/Telus joint bid vehicle could obtain all the open lots</li> <li>• Likely outcome (2+2+1+<u>2</u>) more symmetric than with 3-block set-aside, but spectrum sharing still risks a highly asymmetric outcome (4+1+<u>2</u>) where one national player cannot effectively compete</li> </ul>
<b>3-Block cap</b>	<ul style="list-style-type: none"> <li>• Prevents a Bell/Telus joint bid vehicle obtaining all the open lots</li> <li>• Bell and Telus can still obtain all the open lots and then spectrum share subsequently</li> <li>• Worst case outcome of 2 strong and 1 weak winner (3+1+<u>3</u>) strongly incompatible with ISED’s competition objective</li> <li>• Likely outcome (2+1+1+<u>3</u>) gives one national player a spectrum advantage, especially if Bell and Telus spectrum share (essentially a 3+1+<u>3</u> outcome)</li> </ul>	<ul style="list-style-type: none"> <li>• Prevents a Bell/Telus joint bid vehicle obtaining all the open lots</li> <li>• Bell and Telus can still obtain all the open lots and then spectrum share subsequently, but likely to be more costly than with a 3-block set-aside</li> <li>• Worst case outcome of 3 winners (3+2+<u>2</u>) more symmetric than with a 3-block aside, but still incompatible with ISED’s competition objective</li> <li>• Likely outcome (2+2+1+<u>2</u>) allows more symmetric competition amongst national players</li> </ul>
<b>2-Block cap</b>	<ul style="list-style-type: none"> <li>• Worst case outcome of 4 winners (2+2+<u>2</u>+<u>1</u>) with one national player excluded, likely resulting in just 3 ‘strong’ competitors</li> <li>• Likely outcome (2+1+1+<u>2</u>+<u>1</u>) gives one national player a spectrum advantage, especially if Bell and Telus spectrum share (essentially a 3+1+<u>3</u> outcome)</li> <li>• Excessive fragmentation of set-aside spectrum</li> </ul>	<p><i>Rogers’ recommended proposal</i></p> <ul style="list-style-type: none"> <li>• Positive outcome of 4 winners (2+2+1+<u>2</u>) compatible with ISED’s competition objective</li> <li>• Bell and Telus cannot obtain all the open lots and then spectrum share subsequently</li> </ul>

**Note:** Underline indicates set-aside blocks.

15. It is clear from the table that additional measures are required if ISED is to succeed in its four strong competitor policy. Only a two block set-aside combined with a two block cap will result in four competitors obtaining the spectrum they require. This would be further strengthened by a 30 MHz cap on joint networks. The currently proposed 30 MHz set-aside will not achieve ISED’s own goals; reducing the set-aside to 20 MHz is likely to create more competitive outcomes, but this does not prevent excessive concentration of the open lots, which additionally requires a cap to avoid.

## Auction Design

16. Rogers is unclear on why the Department did not consult more widely on the type of auction format to be used for the 600 MHz auction award. Although the combinatorial clock auction (CCA) format has been widely used, the trend in recent auction policy is moving towards formats with greater simplicity. The use of larger tiers with fewer, generic lots in the 600 MHz auction means the aggregation risk to carriers is much smaller, which is the typical reason to use a CCA format. In Europe, as in Canada, the CCA format has also been associated with high and asymmetric price outcomes, and allegations that outcomes were distorted by spiteful bidding. Therefore, Rogers cannot see why ISED has not considered simpler alternatives.
17. The combination of a CCA (of any of the three proposed variants) and the lack of caps risks winners paying far in excess of any fair and reasonable market price for spectrum. It is possible that a winner's price may be determined by an unsuccessful attempt by a rival to corner the spectrum available and distort competition in the marketplace in its favour. The opportunity cost pricing mechanism in the CCA/ECCA means that a bidder who seeks to exclude rivals faces no penalty in terms of paying more for the lots it does win even if it eventually settles for a smaller number of blocks and does not exclude rivals. Put simply, a bidder wanting to exclude rivals might as well attempt to do so in a CCA, whereas in a SMRA or clock auction, the bidder would pay a higher price itself if it tried and failed to exclude rivals. That there is a strong incentive to exclude rivals, and that this could distort prices paid, is a serious failing of the current proposals.
18. As a result, the ECCA format proposed by ISED is strongly rejected by Rogers. It is much, much more complicated than other CCA formats. The motivation for proposing the ECCA appears to be to make the clock prices in the CCA more aligned with eventual winning prices. However, if lack of pricing transparency is the concern, Rogers does not understand why ISED has not then given consideration to simpler formats such as SMRAs and clock auctions in which bidders simply pay the price of their winning bids, avoiding this disadvantage of the CCA.
19. Furthermore, the pricing rule proposed in the ECCA will lead to prices above those that would be set by reasonable competition between bidders. Under the ECCA, a bidder pays the greatest amount possible given the *possible* supplementary bids that other bidders might make, even if those bidders do not actually make such bids. It is ironic that one of the criticisms of the CCA has been that it encourages spiteful bids intended to increase rivals' prices; the ECCA avoids the need for bidders to make spiteful bids, as the pricing algorithm implicitly supposes that such bids had been made anyway. This approach is simply inconsistent with the reasonable notion of paying fair market value for spectrum, which means winners paying the minimum amount such that there are no alternative users willing to pay more.

20. Therefore, the ECCA format is not an appropriate pricing mechanism. While any efficient, competitive process for spectrum auctions will raise revenue, raising more revenue than necessary to achieve efficient allocation will ultimately harm consumers, as they pay for this excess revenue through higher prices for services. Therefore, Rogers strongly recommends that, notwithstanding our suggestion that alternative simpler formats deserve attention, one of the two CCA variants should be used in absolute preference to the ECCA.
21. Amongst the two CCA options proposed by ISED, the GARP activity rules are the better option. Previous auctions have demonstrated WARP rules were wide open to abuse and this would be limited by use of the GARP rules. Even though GARP rules add somewhat to the auction's complexity, this is acceptable given its advantage over the WARP rules.
22. Regardless of the choice of auction format and the detailed activity rules, if a set-aside is adopted – no matter the size – “fair bidding” rules must be put in place to prevent gaming of the auction. Under ISED's currently proposed rules, set-aside-eligible bidders can strategically bid up prices in the open blocks while they avoid bidding on the set-aside blocks. This allows them to enhance their future bidding eligibility (even under GARP rules) while driving up the national carriers' spectrum prices. This practice was witnessed repeatedly during the AWS-1 auction, resulting in higher amounts paid by the national carriers, costs that are ultimately paid for by the consumer. ISED should therefore implement simple fair bidding rules that require non-national carriers to bid on the set-aside blocks first whenever the set-aside blocks are cheaper than the open blocks.
23. The assignment round rules should also be enhanced in order to facilitate potential future network sharing opportunities. If the Department wants to promote network sharing to achieve other goals, it should not create rules that effectively foreclose such future opportunities. One set of bidders should not be able to forcibly separate other potential network sharing arrangements and prevent them from obtaining adjoining spectrum. Facilitating potential future network sharing opportunities will also improve long-term options for increased rural deployments by improving their economics.

### **Investment in Innovation**

24. ISED mobile wireless competition policy must also be more holistic than simply reduced spectrum costs for non-national carriers if it wishes to stimulate investment in innovative new technologies such as 5G. 600 MHz spectrum is only one potential ingredient for 5G. Access to infrastructure is also essential. The Department can increase competition by ensuring that any infrastructure and rights-of-way held by municipalities, hydro utilities, and local telephone companies are made available to all other competitors. The Department should also ensure access to urban real estate (municipal and private sector) for new 5G micro sites (poles, lamp posts,

street furniture, etc.) is available. The mandatory roaming regime should be maintained in order to offset the advantages of the Bell-Telus joint network.

### **Protecting Canada's Over-the-Air Broadcasters**

25. Finally, ISED's 600 MHz policy should consider the future of Canadian over-the-air ("OTA") television broadcasters who are being displaced by this auction. As recently as 2011, these broadcasters were required to incur substantial costs to transition from analog to digital technology and to implement the current digital television (DTV) allotment plan. These investments have not been fully depreciated. The Department's new DTV allotment plan that incorporates the 600 MHz repacking process affects virtually all OTA broadcasters, meaning that these companies will be required to incur additional substantial costs above and beyond those that they have already incurred to implement the current allotment plan. These costs will further erode the already unsustainable economics associated with the OTA television broadcasting market.
26. The implementation of the 2011 transition to the current DTV allotment plan was a complex and time-consuming exercise. OTA television broadcasters were required to utilize the same limited sources of technology and specialized expertise within a limited timeframe in order to successfully complete their transition by the deadline. These constraints proved very challenging. The repacking process and transition to the new DTV allotment plan will likely be more difficult since virtually all OTA broadcasters will be affected, and the transition will be implemented on both sides of the Canada-U.S. border at the same time. It is therefore crucial that Canadian OTA television broadcasters be provided with an adequate amount of time and money to successfully complete their transition while maintaining the quality of the services that they provide to Canadians.
27. Rogers has reviewed the comments of the Canadian Association of Broadcasters ("CAB") and support their submission.
28. The remainder of Rogers' comments will respond to the specific issues raised in the Consultation Paper.

**Q1A**—ISED is seeking comments on its proposal to implement a set-aside as a pro-competitive measure in the auction process for the 600 MHz band.

29. The competition issues facing the Canadian wireless industry require a more holistic approach than a simple consideration of a set-aside. Promoting competition is not simply a matter of offering access to spectrum on preferential terms for certain

parties. The market has evolved considerably since Industry Canada's initial set-aside in the 2008 AWS-1 auction. Since then, several new entrants went bankrupt while others were purchased. Meanwhile, Bell and Telus formed a network sharing arrangement, and Bell acquired MTS. Canada now has four strong competitors in each market supported by two national wireless networks (Rogers and Bell-Telus) and, in most provinces, a third regional network supporting a fourth retail competitor. As a result, the state of competition is markedly different than a decade ago and requires a broader set of policies than simply reserving spectrum for particular qualified parties.

### **Spectrum costs in Canada are amongst the highest in the world**

30. Before setting new policies, an assessment of past policies is necessary. While ISED has been successful in introducing new entrants into the Canadian wireless industry, it did come at a considerable cost. Spectrum acquisition costs (including annual fees), particularly for national carriers, are very high in Canada. In fact, since 2001, licensees have spent more than \$16B on spectrum at auction and in annual fees, with the bulk of auction costs occurring since 2008.<sup>6</sup> This amount does not include the cost of spectrum acquired through transfers (including spectrum sold by set-aside speculators) nor the \$1.537 billion reserve price for the 600 MHz spectrum auction. While spectrum is undeniably a valuable public resource, it must be recognized that high spectrum prices are bad for the Canadian economy, the wireless industry and for consumers and businesses, who ultimately pay for them.
31. A 2017 report from the GSMA highlighted recent academic work that links upfront input costs to depressed investment and reduced price competition.<sup>7</sup> The report presented evidence linking high spectrum spending with lower quality and reduced take-up of mobile broadband services, and higher consumer prices for mobile broadband data. A central recommendation of the report was that regulators should take great care to avoid actions that could distort auction outcomes and lead to prices that exceed a fair market level.
32. Further, the report identified Canada as having the highest spectrum spend per person in the world over the last decade. As illustrated in Figure 1, since 2008, Canadian operators have paid roughly US\$350 per person for spectrum, compared to under US\$200 in the United States and just over US\$50 in the United Kingdom. While operators directly pay these costs to the government in auctions, Canadian consumers ultimately bear a significant share of these high costs.

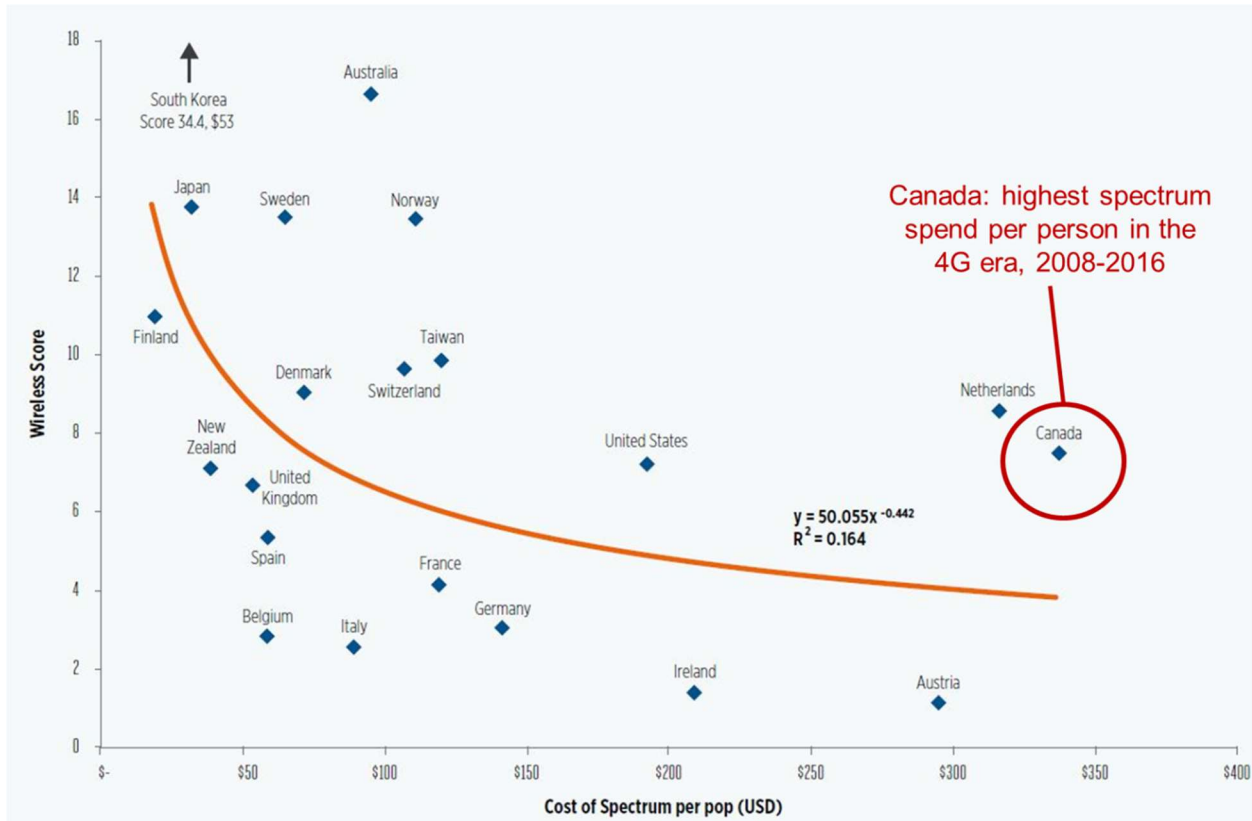
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<sup>6</sup> ISED, *Spectrum Auctions*; [http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf01714.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01714.html). Note: \$16B is nominal and does not account for inflation. Spectrum fees calculated based on industry holdings.

<sup>7</sup> GSMA, *Effective Spectrum Pricing: Supporting better quality and more affordable mobile services*; <https://www.gsma.com/spectrum/effective-spectrum-pricing/>.



**Figure 1: Spectrum costs per person and wireless score for high income countries**



**Notes:** Graph shows the relationship between spectrum spend per person and “wireless score”, a proxy for investment in 4G networks. Emphasis on Canada has been added.

**Source:** GSMA, *Effective Spectrum Pricing*, February 2017, Figure 11, p.29.

33. However, this is only part of the Canadian story, as spectrum spending at auctions across carriers is highly unbalanced. Table 2 compares spectrum spend per person and per person per MHz of spectrum (MHz/Pop) across Canadian mobile operators from 2008-2016, principally the AWS-1, 700 MHz, and AWS-3 auctions. The new entrants have been able to secure spectrum at a modest cost of C\$0.59/MHzPop. In contrast, Rogers (C\$2.65/MHzPop) and Bell-Telus (C\$1.52/MHzPop) have been obliged to pay huge premiums. These are not strictly market prices but have been inflated due to artificial auction constraints that have benefited the new entrants, and reduced the capital available to national carriers to invest in their two networks.

**Table 2: Total spectrum spend per person by Canadian operators, 2008-2016**

<b>Auction Participants</b>	<b>Spectrum spend</b>	<b>Total spectrum acquired (population weighted)</b>	<b>Spectrum spend per person</b>	<b>Spectrum spend per MHzPop</b>
Bell-Telus	C\$5.91B	110 MHz	C\$168.04	C\$1.52
Rogers	C\$4.32B	46 MHz	C\$122.76	C\$2.65
Telus	C\$4.07B	72 MHz	C\$115.82	C\$1.60
Bell	C\$1.84B	38 MHz	C\$52.22	C\$1.37
New Entrants	C\$2.10B	101 MHz	C\$59.73	C\$0.59
<b>TOTAL</b>	<b>C\$12.3B</b>		<b>C\$350.54</b>	<b>C\$1.36</b>

**Notes:** These revenues have not been adjusted for inflation. Excludes spectrum spending of MTS, SaskTel and TBayTel, which totals C\$127m and was focused on Manitoba, Saskatchewan and Northern Ontario respectively.

34. The same GSMA study also thoroughly debunked the myth that the amount of money that operators spend on spectrum should have no impact on the development of mobile services, as spectrum costs are supposedly “sunk” and do not affect subsequent investment decisions. It cites extensive theoretical and empirical work from academia, which shows that in industries with natural limits on the number of viable operators, high input costs depress incentives for investment. In a comprehensive global study of spectrum auction prices, the study also found evidence linking higher spectrum prices to low investment in 4G networks and higher consumer prices for mobile data.
35. These conclusions match with our own experience with auction formats, as the 700 MHz auction rules resulted in Rogers spending over \$3.29B to secure the minimum quantity of 700 MHz spectrum necessary to provide the coverage and service that our customers demand. Spectrum is the lifeblood of mobile networks. However, this represents significant capital diverted from continued expansion of our rural coverage and investment in innovative 5G technologies.
36. Previous set-asides have therefore come at a significant cost. They have driven up spectrum costs dramatically against Canada’s peers, costs which are borne not just by operators but also wireless subscribers, and the economy in general. More importantly, they have skewed auction results, causing large variances in what different operators pay. This directly affects the ability of carriers to invest, and thereby compete with one another. ISED must seriously assess whether such measures remain necessary. The main beneficiaries of set-asides have been speculative acquirers of spectrum who have subsequently sold it for a profit.

#### **Fourth carriers of today are not the new entrants of 2008**

37. Since 2008, the Department has been focused on introducing new competition in the mobile wireless market. This objective has evolved to ensuring there are four strong competitors in each area of Canada. Looking at the competitive landscape today, this goal has been achieved and there is a strong competitor to the national carriers in every region. These fourth carriers are all part of established telecommunications companies that are among Canada's largest providers of quad play services, including telephony, television, internet, and mobile services.

38. The AWS-1 set-aside-eligible bidders included amongst them wireless-only start-ups like WIND Mobile, Mobilicity, and Public Mobile. All were value-focused carriers that were unable to find success in the Canadian market. Public Mobile launched a 3G CDMA network and was acquired by a private equity company before being acquired by Telus. Mobilicity was in bankruptcy protection for two years before Rogers acquired the company and ensured ongoing service to Mobilicity customers. WIND Mobile went through a number of structural changes before being acquired by Shaw and being rebranded Freedom Mobile.

39. The "new entrants" of today, if they can still be called that, are in far better shape:

- Shaw, Freedom Mobile's parent, has an enterprise value of \$17B;
- Quebecor, Videotron's parent, has an enterprise value of \$10.3B;<sup>8</sup>
- SaskTel has a market share of 66% in its operating area<sup>9</sup> and the deepest spectrum portfolio of any single carrier in Saskatchewan; and
- Bragg Communications, parent of Eastlink and Canada's largest privately-held telecommunications company, reports more than \$640M in annual revenue, not including their mobile wireless business.<sup>10</sup>

These are all well-capitalized, highly-competitive, companies with an established presence in their operating regions which are not in need of taxpayer-subsidized spectrum prices.

40. When the 2008 AWS-1 auction took place, none of the original set-aside-eligible bidders, including Videotron, Eastlink, and Shaw, possessed any mobile spectrum. That is no longer the case today, as all set-aside-eligible bidders now possess balanced spectrum portfolios that include low, mid, and high mobile spectrum bands. While their spectrum holdings are not as broad or deep as those of the national carriers (excepting SaskTel, which is an established regional operator), they also serve significantly fewer mobile subscribers compared to the national carriers.

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<sup>8</sup> As per Scotiabank, *Converging Networks* [Analyst Report], August 8, 2017.

<sup>9</sup> CRTC, *Communication Monitoring Report 2016*;

<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2016/cmr.pdf>.

<sup>10</sup> CRTC, *Reporting Guide for the Aggregated 2016 Broadcasting Distribution Undertakings (BDU) Annual Return Form – Bragg Communications*; [http://crtc.gc.ca/public/5040/Bragg\\_2016\\_BDU\\_Aggregate\\_Return\\_public.pdf](http://crtc.gc.ca/public/5040/Bragg_2016_BDU_Aggregate_Return_public.pdf).

Notably, set-aside-eligible carriers have extremely high MHz-per-customer ratios, meaning that they have substantial spare capacity and can accommodate significant growth in subscribers and data use before facing any spectrum capacity constraints. In contrast, national operators have much lower ratios, and a more urgent need to accommodate rapid growth in mobile usage per customer. In this context, it makes no sense to provide non-national carriers with access to nearly half of the 600 MHz band at heavily subsidized prices on the basis that they require more capacity.

41. This is the fifth auction in succession that ISED has proposed competition measures aimed at supporting “new competitors” and/or regional operators, including 2008’s AWS-1 band, 2014’s 700 MHz band, and 2015’s 2500 MHz and AWS-3 bands. Over the last decade, ever larger quantities of spectrum have been set aside or reserved for such players. Some of that spectrum has ultimately been sold to national operators or other regional operators, resulting in windfall gains for the seller. While Rogers may not have agreed with the Department’s approach to supporting recent entrants, we submit that the Department has reached its goal of providing sufficient low cost spectrum to these companies and they no longer require such privileged treatment in spectrum auctions. Continued set-asides are no longer required, especially in light of the resources of the new entrants and the detrimental effects of the set-asides.
42. Despite the Government’s largesse, the new entrants continue to argue that they have been disadvantaged. In a recent interview with the Globe and Mail, Videotron’s CEO, Pierre-Karl Peladeau said, “You should never forget that the first pieces of spectrum they [the national carriers] had were free” adding his family-controlled company has paid for all of the airwaves it owns. “We spent a significant amount of money to acquire spectrum, and we never had spectrum for free. That was not the case for the incumbents.”<sup>11</sup>
43. In fact, the national carriers did not receive free spectrum while Videotron has actually profited from the auction process. What Mr. Peladeau fails to mention is that the national carriers have paid billions of dollars in annual spectrum fees since the original award of the licences. Rogers alone has paid approximately \$1.275B in annual spectrum fees over the period 1985-2017 for its 850 MHz and 1900 PCS spectrum that was not acquired through auction. In addition, the incumbents received their initial spectrum at a time when the money losing wireless market was measured in the thousands, not the tens of millions of customers the profitable industry enjoys today. As a result, Rogers Wireless incurred huge losses in its first 20 years of operation.

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<sup>11</sup> Globe & Mail. *Quebecor defends Ottawa’s spectrum reserve amid criticism from rivals*; <https://beta.theglobeandmail.com/report-on-business/quebecor-defends-ottawas-spectrum-reserve-amid-criticism-from-rivals/article36428589/>.

44. It is actually Videotron who has been unduly advantaged. During the 700 MHz and 2500 MHz auctions, ISED set spectrum limits to ensure the new entrants won spectrum. Videotron took advantage of these rules to win licences across Canada for a total sum of \$420 million. They then turned around and sold all the blocks outside their operating footprint in Quebec and Eastern Ontario to Shaw for \$430 million. Not only did they receive all the 700 MHz and 2500 MHz spectrum they required in their footprint effectively for free, they actually made a \$10 million bonus. Altogether, Videotron has spent just over \$1 billion on spectrum licenses since its inception but then sold its surplus blocks for \$615 million. It therefore bought 80-130 MHz of spectrum (depending on licence area) in its footprint for a net total of about \$390 million. Rogers paid approximately \$325 million for its 20 MHz of AWS-1 spectrum alone in the same footprint. The myth that the national carriers received free spectrum while the new entrants have not must be dispelled once and for all.
45. As a result, it is time to retire set-asides. Several jurisdictions initially used spectrum aggregation rules to support new entry to the wireless industry and then subsequently allowed those carriers to compete on their own. For example, both the U.K. and Denmark had set-asides reserved for a new competitor. However, they both ended such privileges over time. In the U.K., Ofcom used set-asides and caps in 2000 and 2013 respectively but their upcoming auction does not reserve any spectrum for new entrants. In Denmark, the wireless carrier “Three” which entered the market with a 3G licence, benefited from a set aside of 900 and 1800 MHz spectrum in 2010. The Danish authorities subsequently held open auctions afterwards, allowing Three to compete on its own without artificial support. Despite an open auction, Three still won spectrum in 2016 against the incumbents. It is time Canada followed suit and allowed the regional carriers, who are well capitalized, to compete on their own.

### **Set-asides encourage abusive price-driving behaviour**

46. Strategic bidding by new entrants plagued the AWS-1 auction. The new entrants repeatedly bid on open blocks when cheaper set-aside blocks were available. Knowing the national carriers had no choice but to re-bid for the open licence blocks due to the artificial spectrum scarcity created by the set-aside, the new entrants freely parked their eligibility points on the open blocks, driving up the costs for the national carriers while keeping the set-aside prices down. There is no reason to think they will behave otherwise in this auction.
47. All three of ISED’s proposed auction formats provide the same strategic opportunities for set-aside-eligible bidders to drive up the prices paid for non-set-aside spectrum. These higher spectrum costs are ultimately borne by consumers and negatively impact affordability for all Canadian mobile subscribers and generally hurt competition in the mobile industry.

48. There are a number of reasons why bidders eligible to take advantage of pro-competitive measures might seek to drive up the price of open spectrum:
- i. Bidding for open spectrum instead of set-aside spectrum may be an effective strategy in order to gain additional flexibility for subsequent bids on the set-aside spectrum that the eligible bidder actually wants;
  - ii. By driving up the price of non-set-aside spectrum, a winner of set-aside spectrum might seek to establish a higher valuation for its spectrum in the case that it were eventually to transfer that spectrum to another party. Spectrum speculation of this type was seen when Videotron acquired spectrum in the 700 MHz auction and later sold it to Freedom Mobile for a much higher valuation, in part due to the higher prices that Rogers and other national carriers paid; and
  - iii. A winner of set-aside spectrum might wish to reduce the financial resources available to other winners that could be used for network deployments or to promote products and services for customers post-auction. Ultimately, such behaviour is detrimental to all Canadian consumers and businesses and to competition in the market place.
49. All these goals can be accomplished with minimal risk, in particular in the context of the CCA (regardless of activity rule). Therefore, Rogers strongly recommends that the proposed rules be modified to reduce the risks of the auction outcome being compromised by price driving behaviour of set-aside-eligible bidders. We propose two amendments.
50. First, the adoption of a spectrum cap (as discussed below) would go a long way to mitigating the risk of bidders artificially boosting the number of spectrum blocks sought to drive prices.
51. Second, a simple “fair bidding” rule could be used to prevent manipulation of clock prices (explored in more detail below in Q7). In short, where the clock price of set-aside spectrum is less than non-set-aside spectrum in a service area, set-aside-eligible bidders should be required to bid preferentially for set-aside spectrum (i.e. only bid for non-set-aside spectrum if their demand in that service area exceeded the number of set-aside lots). This change would in no way restrict a set-aside-eligible bidder pursuing a straightforward surplus maximising strategy. We note that a similar rule has been used successfully for a CCA in Slovenia, where one of the 800 MHz blocks was reserved for an entrant.<sup>12</sup>

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<sup>12</sup> Post and Electronic Communications Agency of the Republic of Slovenia, *Public Tender with a Public Auction for Assigning Radio Frequencies for the Provision of Public Communication Services in the 800 MHz, 900 MHz, 1800 MHz, 1800 MHz, 2100 MHz, and 2600 MHz Frequency Bands* [Non-Binding Translation]; [http://www.akos-rs.si/files/APEK\\_eng/Radio/tender-documentation.pdf](http://www.akos-rs.si/files/APEK_eng/Radio/tender-documentation.pdf).

52. Furthermore, this simple rule would allow a significant simplification of the rules for price increments. The proposed rules envisage that the price of set-aside spectrum can never exceed the price of non-set-aside spectrum, if necessary increasing the price of both even if there is only excess demand for set-aside blocks. However, this price increment rule would not be needed if set-aside-eligible bidders were required to bid preferentially for set-aside blocks if they were cheaper. Indeed, we note that in order to have proposed such a price increment rule, the Department must currently be anticipating that set-aside-eligible bidders might bid for non-set-aside spectrum even where set-aside blocks are cheaper. If set-aside-eligible bidders never acted in this way, the rule would be unnecessary.

### **Policy affecting Competition between National Carriers is Vital**

53. Over the last 15 years, the key dynamic driving service and price innovation in the mobile wireless industry has been competition between Rogers, Bell, and Telus. As noted above, Rogers was first to deploy 4G LTE in Canada, which helped drive the cost per gigabyte of mobile broadband data down for all wireless subscribers while increasing speeds. We also helped launch the modern smartphone era in Canada as the exclusive carrier for the Canadian launch of the Apple iPhone and the first operator to launch Android in Canada. Today, the three national operators account for 90% of wireless subscribers between them,<sup>13</sup> a figure that reflects the quality of the national networks and advanced wireless services available to consumers. Canadians in all regions currently have access to world-class mobile voice and broadband data services due to the competition between national operators, with the wireless measurement company Open Signal stating that Canadian national operators' network speeds "surpass the majority of the world's operators."<sup>14</sup>

54. While the wireless carriers that came to market after the 2008 auction have also played a role in competition, which will continue to grow, the three national carriers still play the pivotal roles. ISED's spectrum allocation policy, however, has continued to focus exclusively on support for those entrants, with scant regard for the negative impact of such policies on sustainable competition between the national carriers. The Department must provide greater consideration of the impact that set-asides and asymmetric caps have had on spectrum prices for national wireless service providers, and thus the prices Canadian consumers pay.

55. The Department should be focusing at least as much attention on asymmetries between national carriers as it does between them and recent entrants. The Canadian market is unusual in that two of the largest three operators, Bell and Telus, share their spectrum and their network. Whereas, in the downstream market,

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<sup>13</sup> CRTC, *Communications Monitoring Report 2016*;  
<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2016/cmr.pdf>.

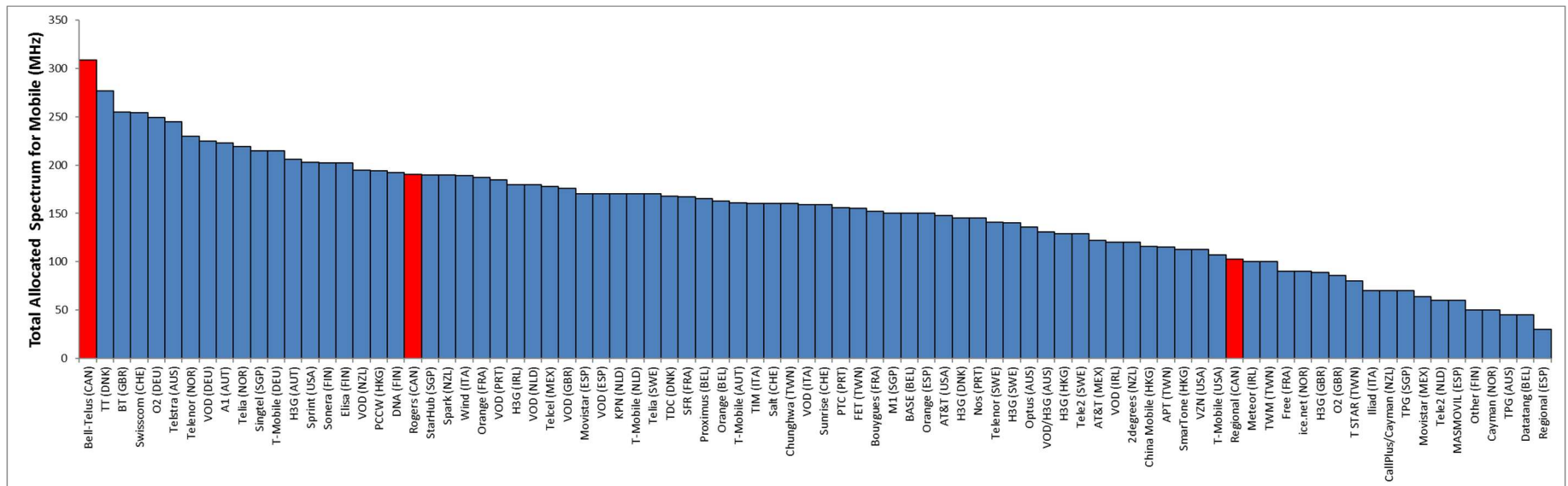
<sup>14</sup> Open Signal, *State of Mobile Networks: Canada (January 2017)*;  
<https://opensignal.com/reports/2017/01/canada/state-of-the-mobile-network>.

Rogers, Bell and Telus have similar weight, this is not necessarily true in the market for spectrum, where Bell and Telus can potentially leverage the combined weight of their spectrum sharing and joint network arrangement. Policies to assist newer entrants and regional carriers have had unintended consequences of negatively influencing competition amongst national carriers, exacerbated by the joint Bell-Telus network.

56. The result has been that the Bell-Telus joint network has been able to acquire one of the largest spectrum portfolios in the world, as can be seen in Figure 2. They managed to do this, despite caps and set-asides, by bidding separately and combining their spectrum after each auction.



Figure 2: Spectrum holdings by operator by country



**Notes:** Spectrum holdings are population weighted. Spectrum holdings for all non-national operators are aggregated under “Regional (CAN)”. Spectrum holdings for Telia and Telenor in Denmark are also added together, as they operate a joint network and share spectrum similar to Bell-Telus (“Bellus”).

57. The challenges with the existing associated entity and collusion rules are clearly demonstrated by the ongoing Bell and Telus relationship. Since 2008, Bell and Telus combine their spectrum after every auction, along with their local telecommunications wireline assets, allowing them to avoid capital costs and improve speeds. They already have a joint 4G LTE network and while the 600 MHz band may not yet be a formal part of the agreement, economics and technology will ensure this arrangement is, almost certainly, extended into the 600 MHz band as well. Everyone, including the Department, knows this. This extensive relationship means that each partner has an intimate knowledge of each other's spectrum needs and bidding behaviour. This can be seen when, without any collusion, Bell and Telus regularly divide the non-set-aside spectrum between the two companies perfectly along their wireline territories or use their balance sheets to strategically foreclose potential contiguity for other carriers.

58. ISED's competition measures have focused almost exclusively on spectrum for set-aside-eligible competitors, while ignoring asymmetries between national operators. Maintaining a truly competitive mobile market relies on more than just ongoing assistance to newer entrants. As discussed further below, the Department's mobile wireless competition policy must be more holistic than simply reduced spectrum costs for non-national carriers. For example, auction caps must be adopted in order to ensure a level playing field between the national carriers.

### **Spectrum caps are essential**

59. Rogers has long been a proponent of open auctions. We continue to believe having market forces fully determine the outcome of spectrum licensing ensures those companies that value the spectrum the most will be able to acquire it and put the spectrum to its highest use. It also makes certain that all bidders pay the true market value of this scarce and valuable resource to the benefit of Canadian taxpayers.

60. The 600 MHz auction however will be the fifth auction in succession that ISED has proposed measures aimed at supporting the newer entrants and/or regional operators. The result of this policy is that it artificially squeezes spectrum available for national carriers. This manufactured scarcity has dramatic bidding repercussions, especially since two out of the three national carriers are already in an existing network sharing relationship. As currently proposed, the 600 MHz auction could result in a very limited number of winners. Possible outcomes include:

- One set-aside-eligible bidder buying seven blocks in a service area (one winner overall);
- One set-aside-ineligible bidder buying all non-set-aside spectrum in a service area with one set-aside-eligible bidder buying all set-aside spectrum (two winners overall);

- Two set-aside-ineligible bidders, who share spectrum, buying all non-set-aside spectrum in a service area with one set-aside-eligible bidder buying all set-aside spectrum (three winners overall, but spectrum benefits only two networks).

61. None of these outcomes meet ISED's objective of four effective competitors in each service area. While these particular outcomes are not exhaustive, and some are clearly less likely than others, they are nevertheless possible. By way of example, during the AWS-3 spectrum auction, Telus won all the available spectrum in Manitoba and Saskatchewan while Bell won all the available spectrum in the North.
62. Such competitive outcomes would be terrible for the industry. As a result, if ISED institutes a set-aside, and notwithstanding our preference for open auctions, it must implement an accompanying 20 MHz spectrum cap with a rule preventing the combining of 600 MHz spectrum above the cap for five years.
63. Such a policy is supported by the *Framework for Spectrum Auctions in Canada* (FSAC). It contemplates the various measures available in an auction that could be used by ISED to promote a more competitive marketplace if required. One is set-asides, the other is spectrum caps. According to the Framework, spectrum aggregation limits (caps) may be imposed by the Department when “a bidder that acquires an amount of spectrum beyond a certain level would not face effective competition from providers of closely substitutable services.”<sup>15</sup>
64. Such an outcome is possible. With a 30 MHz set-aside, there will only be 40 MHz of spectrum available to national carriers. One carrier, or two carriers acting in concert, could monopolize the limited amount of spectrum available. It would be inconsistent for ISED to be making a large set-aside on the basis that the distribution of the 600 MHz band has the potential to affect competition in the market place, while at the same time disregarding the possibility of a small number of winners controlling the band despite the set-aside.
65. These concerns are not just theoretical. Rogers believes Bell and Telus have an established pattern of spectrum sharing. Even without any collusion, the AWS-3 auction saw Bell and Telus divide the non-set-aside spectrum between the two companies perfectly along their wireline territories, only evenly dividing the Southern Ontario service area. During the 700 MHz auction, Rogers believes Bell and Telus took actions to strategically keep newer entrants and regional players from being contiguous with Rogers. In the 600 MHz auction, there is no disincentive at all for them to bid as a single entity in this auction due to the lack of a cap. Their combined financial resources would allow them to make credible bids for all of the available non-set-aside spectrum in order to deny Rogers any spectrum or make its costs

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<sup>15</sup> ISED, *Framework for Spectrum Auctions in Canada*; <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01626.html#section4>.

prohibitively expensive. The motives for such bids would be clearly anti-competitive, aimed at reducing Rogers' ability to compete in the marketplace.

66. If ISED is convinced they must use a set-aside to implement an objective of four effective competitors, then it needs to set an appropriate cap as well. With seven blocks available, if the Department wishes to guarantee a four-winner outcome, then a 20 MHz spectrum cap must be established. A cap set at 30 MHz would not guarantee a four-winner outcome; rather it would permit more concentrated outcomes, such as two winners of three blocks together with one winner of a single block, which is clearly contrary to ISED's stated objectives. A 20 MHz cap is therefore the only reasonable solution. However, a cap of 30 MHz for set-aside-eligible bidders together with a 20 MHz for other bidders is a possible compromise alternative, but less effective in guaranteeing a four-competitor outcome than 20 MHz for all bidders.
67. In order to make the cap truly effective and ensure a competitive auction outcome, the set-aside should be reduced to 20 MHz. As explained in Q1B, a 20 MHz set-aside is the appropriate amount from both a technical and economical perspective. 20 MHz is still substantial – almost a third of the total available spectrum. If a 20 MHz set-aside was adopted, ISED could then elect to implement a 20 MHz cap for individual bidders, with possibly a 30 MHz cap for bidding consortiums or even for set-aside bidders (this is further explained in Q1D).
68. Other combinations of caps and set-asides would simply not result in competitive outcomes. With a 30 MHz set-aside, a cap of 30 MHz or more would be entirely ineffective. With only 40 MHz available, this would permit two winners of the non-set-aside spectrum (or a single winner with a 40 MHz cap). This would eliminate one of the established national operators and result in, at most, three winners. Therefore, a 20 MHz cap is needed if ISED wishes to ensure four winners of 600 MHz spectrum and vigorous competition in downstream markets.
69. On the other hand, a 20 MHz cap combined with a 30 MHz set-aside would have some perverse consequences, as it would force two winners of set-aside spectrum, contrary to ISED's stated objective of encouraging a "strong" regional competitor (or else possibly leave one set-aside block unsold). Further, it would still allow one of the three established national players to be excluded (as the Department has proposed to make only 40 MHz of non-set-aside spectrum available).
70. This perverse outcome is a result of the excessive size of the set-aside, rather than the cap. We consider that the excessive size of the set-aside relative to the limited amount of spectrum available is the main problem with the current 600 MHz auction proposals.
71. Taken together, a 20 MHz set-aside is the logical consequence of a four-competitor objective. With a 20 MHz cap and a 20 MHz set-aside, there would be at least four

winners in total (assuming sufficient participation in the auction that there is no unallocated spectrum), with three winners of 20 MHz and one winner of 10 MHz. This would appear to be entirely in line with ISED's objectives for competition as set out in the consultation document.

72. None of these approaches would eliminate competition within the auction. To the contrary, there would be competition amongst set-aside-ineligible bidders to win two blocks rather than one. There may also be competition between set-aside-eligible bidders to win two blocks to establish a single "strong" regional competitor.
73. The absence of a cap in the 600 MHz auction could result in Canada again being an outlier for some of the most expensive spectrum prices in the world. All of the proposed CCA formats have the property that spectrum prices are likely to be higher – potentially much higher – as a result of the absence of a spectrum cap. It is possible that the price paid by a winner of spectrum could be determined – through the opportunity cost-based pricing mechanism – by unsuccessful (or predatory) bids of other bidders for packages of many lots intended to gain a stranglehold over the 600 MHz band. The Department must carefully evaluate the impact its proposed 600 MHz auction policy is likely to have on market outcomes, as that is the true objective of spectrum policy.
74. Overall, the current 600 MHz proposals appear inconsistent with the Department's own objectives. The absence of a spectrum cap could permit significant concentration of spectrum holdings contrary to the stated objective of promoting competition that underpins the set-aside proposal. Further, they are disproportionate because a 30 MHz set-aside would likely weaken competition amongst national carriers for no significant strengthening of the position of a regional competitor relative to a 20 MHz set-aside.

**Q1B**—ISED is seeking comments on its proposal to set aside 30 MHz of spectrum in the 600 MHz band for eligible entities and to have open bidding (no pro-competitive measures) on the remaining 40 MHz in the band.

75. Rogers does not generally support set-asides or caps that interfere with the operation of market forces and artificially distort outcomes, providing an unfair subsidy to one or more competitors at the expense of others. In general, Rogers supports the use of open bidding for the licensing of mobile spectrum so that those companies that value the spectrum the most will be able to bid for it and put the spectrum to its highest use. This will also ensure that Canadians will derive the maximum benefits from this scarce and valuable resource.

76. The Department asserts, “Access to additional spectrum would assist [new competitors] in their efforts to provide services using the latest technologies and increase network capacity in order to meet the traffic demands of a growing subscribership. In addition, national incumbent service providers would also benefit from access to additional spectrum, allowing them to increase capacity to better serve their substantial subscriber base.”<sup>16</sup> However, it is unclear why access to 600 MHz low band coverage spectrum is more important to the new competitors than the national carriers. Moreover, there is no clear explanation why 30 MHz is an appropriate size for a set-aside, when its most likely outcome is to hurt downstream competition.

### **The size of the set-aside**

77. The proposed 30 MHz set-aside is a bad option for Canadian wireless consumers, especially those in rural areas. While clearly beneficial to set-aside-eligible carriers, it increases the risk that Bell and Telus together could pursue an anti-competitive strategy of excluding Rogers from the band, if so inclined. If the Department ultimately believes that the set-aside-eligible carriers, who are amongst Canada’s largest telecommunications companies, require further taxpayer subsidized access to spectrum, a 20 MHz set-aside would achieve ISED’s goal of supporting a strong regional competitor. However, a 20 MHz set-aside would not unduly constrain the supply of spectrum to national carriers though it still may result, as in previous auctions, in winning bidders paying prices well above the true market level, reducing their capital available to invest in less economical areas.

78. There is no technical reason why the set-aside should be fixed at 30 MHz. 600 MHz spectrum can be used for both rural and urban applications. Rogers believes that deployment of a single 5+5 MHz carrier (providing speeds of 37.5Mbps) is likely uneconomic and, more importantly, will provide a poor customer experience. By contrast, a 10+10 MHz carrier in 600 MHz is both economically and technically viable to meet both rural coverage requirements and also improve penetration of buildings in both urban and suburban environments, providing peak speeds of up to 75Mbps.<sup>17</sup> In addition, no carrier in Canada has more than 10+10 MHz of contiguous, low band spectrum.

79. With only the Department’s proposed four blocks available for Rogers, Bell and Telus, the likely auction outcome is a single winner of two blocks and two winners of a single block, though exactly who gets what will likely vary from area to area. More concentrated outcomes are also possible, as we discuss below. However, such an auction outcome could give one of the established national operators a spectrum

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<sup>16</sup> ISED, *Consultation*, para 18.

<sup>17</sup> Theoretical peak speeds of a Cat 4 LTE device. 3GPP, *36.306 Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities*;  
<https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=2434>.

advantage over the other two, creating an unnecessarily asymmetric position in the market place. Quality of service and peak speeds would be limited for the operators with a single 600 MHz block. Those operators might struggle to replicate the service quality and peak speed of a national operator with two blocks. At the very least, a one-block operator would face a disadvantage in that the marginal costs of achieving a given level of network capacity would be higher with less spectrum. Under the 30 MHz set-aside proposal, the effective competition for a two-block winner of non-set-aside spectrum would come primarily from the winner of the set-aside spectrum, competition that is not happening outside of urban markets.

80. As low band spectrum, like the 600 MHz band, is ideal for rural coverage, such spectrum disadvantages in practical terms could translate into both less capital and less spectrum for rural deployments. At a time when both ISED and the CRTC are looking for ways to improve connectivity in areas traditionally with challenging economics to provide advanced services, it does not make good policy to reduce the available spectrum to the only two national wireless networks that are most likely to serve such areas.
81. In contrast, a set-aside of 20 MHz only would promote a more competitive situation between the three national operators. The likely outcome for the non-set-aside spectrum would be that two out of the three national operators would win two blocks. This would avoid creating the situation in which just one of the three national players had a significant spectrum advantage, with a consequent reduction in the intensity of competition in the market place.
82. At the same time, reducing the set-aside from 30 MHz to 20 MHz would not significantly impede a regional operator winning the set-aside spectrum from competing effectively. 20 MHz (10+10 MHz) is sufficient bandwidth for a strong business case to deploy LTE services in rural areas and the competitive landscape of Canada's mobile wireless market – i.e., the financial strength of the “new” entrants – means that there will be a single set-aside winner in all service areas (except, perhaps, in Eastern Ontario).
83. If national operators each won one or two blocks, the regional carrier would be at no disadvantage in terms of total spectrum won relative to the national operators; indeed, in almost all cases the regional carrier would have fewer customers than a typical national operator and less need for spectrum as a result. It is therefore simply unnecessary to gift a newer or regional operator a third 5+5 MHz block as it has limited additional impact on its competitiveness over and above the first two 5+5 MHz blocks.
84. At a network level, as shown in Table 3, holdings of sub-1 GHz spectrum in Canada are highly asymmetric. Across most of Canada: Bell and Telus combined have 67.3 MHz (54%); Rogers has 48 MHz (37%); and, other operators have 11 MHz (9%).

The relative position of other operators is presumably part of ISED's rationale for having a set-aside though it does not account for the much smaller number of subscribers and fewer legacy technologies that newer entrants must support. Further, if the Department is concerned about the risks of one party having too little sub-1 GHz spectrum, it should also consider the risk of one party having too much.

**Table 3: Existing share of low band mobile spectrum in Canada**

Service Area	Service Area Name	Rogers		Bell-TELUS		Other	
		MHz	%	MHz	%	MHz	%
2-001	Newfoundland & Labrador	49	38%	59.0	46%	10	8%
2-002	Nova Scotia & Prince Edward Island	49	38%	59.0	46%	10	8%
2-003	New Brunswick	49	38%	59.0	46%	10	8%
2-004	Eastern Quebec	49	38%	67.0	52%	10	8%
2-005	Southern Quebec	49	38%	68.4	53%	10	8%
2-006	Eastern Ontario & Outaouais	49	38%	67.4	53%	10	8%
2-007	Northern Quebec	37	29%	71	55%	10	8%
2-008	Southern Ontario	49	38%	68.5	54%	10	8%
2-009	Northern Ontario	37	29%	63.6	50%	17	14%
2-010	Manitoba	37	29%	78.0	61%	10	8%
2-011	Saskatchewan	37	29%	46.9	37%	35	27%
2-012	Alberta	49	38%	69	54%	10	8%
2-013	British Columbia	49	38%	68.1	53%	10	8%
4-172	Northwest Territories	25	20%	73.0	57%	10	8%
4-171	Nunavut	25	20%	73.0	57%	10	8%
4-170	Yukon	25	20%	73.0	57%	10	8%
<b>1-001</b>	<b>Canada</b>	<b>48</b>	<b>37%</b>	<b>67.3</b>	<b>54%</b>	<b>11</b>	<b>9%</b>

**Notes:** Other includes Shaw, Eastlink, Videotron, TBayTel, SaskTel, Xplornet, and Feenix. Sub-1 GHz spectrum includes 700 MHz and 850 MHz. Telus owns ESMR licenses on a site by site basis. We have assumed that Telus owns a consistent 10 MHz of ESMR spectrum in all Tier 4 regions it is licensed. All numbers population weighted.

85. Consider the case where Bell and Telus buy all non-set-aside spectrum in the auction. This would maintain their share of sub-1 GHz spectrum at 54%, vs 24% for Rogers and 21% for others. While such an outcome would improve the relative position of other operators, who may or may not invest significantly in rural networks, it would also greatly extend an advantage to the joint Bell-Telus network over Rogers, the only rival with an existing nationwide rural network. Such an outcome could give the Bell-Telus network a capacity advantage outside urban areas that



would be costly to overcome, given that no more sub-1 GHz spectrum will be released in the foreseeable future.

86. Therefore, there is a balance to be struck in achieving ISED's four-competitor objective. Reserving an excessive amount of spectrum for one competitor is not pro-competitive if this significantly diminishes competition amongst the other three. A 20 MHz set-aside would strike a better balance, as it would likely create three competing operators with two blocks of 600 MHz spectrum and one with a single block.

### **No case for a set-aside to carve out spectrum for a fifth player**

87. For the avoidance of any doubt, a three-block set-aside cannot be justified on the grounds that it would allow for a strong regional competitor (say with two blocks) and an additional entrant as well. Such an entrant would be, at best, a niche player and not contribute any significant additional competitive vigour to the market place. We can think of no regulator internationally who has intervened to create five competing mobile wireless operators, in particular with a fifth player who would have an extremely limited spectrum portfolio and remain a weak competitor.

88. As noted above, LTE necessitates a 10+10 MHz carrier to be economic as a single band network. Strong regional competitors, whether newer entrants or regional incumbents, already have additional low, mid and high band mobile spectrum to aggregate and deploy. As noted above, they are all owned by well-capitalized companies that have access to sufficient capital to ensure they win all the set-aside spectrum in their operating service areas. Even if a fifth bidder was able to win a single 5+5 MHz block, which with the proposed reserve bid amounts and competition from established set-aside-eligible bidders is highly unlikely, a single 5+5 MHz block in one band would likely be uneconomic to deploy across an entire Tier 2 level.

89. The Department should not create excessive fragmentation of spectrum that will not have the same service and competition benefits of holding larger, contiguous blocks. Niche providers focused on small rural areas have other options to acquire spectrum, such as commercially negotiated spectrum subordination arrangements. The success of such tools was highlighted in the recent AWS-1 renewal process, where Ecotel, shared that it "was successful in implementing such arrangements with Rogers for specific remote locations in Quebec, Labrador and Nunavut."<sup>18</sup>

90. Given the potential for a set-aside to allocate spectrum at below its true market price and so create subsequent windfall gains for speculative bidders, ISED should expect lobbying for maintaining a 30 MHz set-aside from parties wanting to win set-aside spectrum. However, such requests should not be acceded to. Rather, if the

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<sup>18</sup> Ecotel, *Consultation on a Licence Renewal Process for Advanced Wireless Services and other Spectrum: Reply Comments*, para 31; [https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/aws-ecotel.pdf/\\$FILE/aws-ecotel.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/aws-ecotel.pdf/$FILE/aws-ecotel.pdf).

Department's policy is to promote an effective fourth regional competitor, this objective should not be undermined by creating artificially protected positions for further winners (i.e. a fifth or further operators). If ISED has a four-competitor objective, then it should implement this through a two-block 20 MHz set-aside, rather than undermining and weakening competition by creating opportunities for further winners of set-aside spectrum.

**Q1C**—ISED is seeking comments on its proposal to limit the eligibility criteria to bid on set-aside spectrum to those registered with the CRTC as facilities-based-providers, that are not national incumbent service providers, and that are actively providing commercial telecommunication services to the general public in the licence area of interest, effective as of the date of application to participate in the 600 MHz auction.

91. As Rogers explains above, Rogers supports open bidding for the licensing of mobile spectrum since this will result in spectrum being put to its highest use. Setting aside a large amount of 600 MHz spectrum will significantly limit the demand that can be expressed for this spectrum and will result in a substantial and unwarranted taxpayer subsidy to the newer entrants and regional operators that will successfully bid for this spectrum.

92. In the event that the Department elects to license 600 MHz spectrum on the basis that it has proposed in the Consultation Paper, then we believe the Department should use a similar eligibility criteria requirement as that of the AWS-3 auction.

D4 [Large Wireless Service Providers (LWSP)] are defined as companies with 10% or more of national wireless subscriber market share, or 20% or more of wireless subscriber market share in the province of the relevant licence area. New entrants are defined as service providers that are not LWSP.

D5 Bidding on set-aside spectrum licences in each Tier 2 region is restricted to new entrant bidders that are:

- i. actively providing commercial mobile wireless services using licensed spectrum in the Cellular, PCS, AWS, BRS, MBS or WCS bands to the general public; and

- ii. operating a terrestrial wireless network in the Tier 2 service area, with the minimum population coverage levels shown in Table 2, effective as of the date of application to participate in the AWS-3 auction.<sup>19</sup>

93. While it is clear that the well-capitalized newer entrants do not require additional taxpayer subsidized spectrum to add to their already large taxpayer subsidized spectrum portfolios, Rogers does believe that only those new entrants that are actively providing commercial mobile wireless services and are operating a wireless network should be eligible to bid for the 600 MHz set-aside spectrum. Introducing new, unsustainable competition into the Canadian wireless market will not benefit Canadian consumers and businesses. The Department should also ensure these operating newer entrants are providing an acceptable level of coverage in a given licence area to be eligible.

94. If the Department's goal is to ensure sustained, facilities-based wireless competition, then the set-aside spectrum should be restricted to those most able to provide it. It is also for these reasons as well that the Department should take measures to ensure spectrum availability for the national networks as the operators most likely to ensure competition.

**Q1D**—ISED is seeking comments on its proposal to limit the transferability of the set-aside spectrum for the first five years of the licence term.

95. The Department states, "in order to ensure the effectiveness of the set-aside and to deter speculation, it is proposed that the set-aside licences acquired by set-aside-eligible bidders, would not be transferable to set-aside-ineligible entities for the first five years of the licence term."<sup>20</sup> Notwithstanding Rogers' general objection to set-asides, we support the Department's proposal that would provide a five-year moratorium on the transfer of set-aside spectrum to a set-aside-ineligible entity. If a set-aside is used, this moratorium is necessary to limit incentives for rent-seeking behavior by speculative bidding further distorting auction outcomes.

96. However, if the objective of the Department is to deter speculation and eligibility to bid on the set-aside spectrum is limited to facilities-based-providers that are actively providing commercial telecommunication services in the licence area of interest, the Department should also extend the moratorium on the transfer of set-aside spectrum to all entities, including set-aside-eligible ones. Such a move will further limit spectrum speculation and help ensure that the spectrum is obtained by operators

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<sup>19</sup> ISED, *Technical, Policy and Licensing Framework for Advanced Wireless Services in the Bands 1755-1780 MHz and 2155-2180 MHz (AWS-3)*; <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10911.html#s6>.

<sup>20</sup> ISED, *Consultation*, para 30.

who will move quickly to deploy services and benefit Canadian consumers. The industry has already witnessed new entrant to new entrant transactions in which the new entrants have profited by hundreds of million dollars. Such speculation should end.

97. The transferability rules should also be amended to prevent joint network partners from abusing the 20 MHz spectrum cap that Rogers recommended in Q1A. As previously explained, carriers who bid separately but who subsequently merge their spectrum holding (whether through a permanent transfer or subordinate licence) should not be allowed to combine more than 30 MHz total together. For example, if both carriers were to win 20 MHz at auction for a total of 40 MHz, only 30 MHz could be combined. The remaining 10 MHz would have to be returned to ISED. This would better reflect the true nature of the network sharing partners and prevent them from skewing the auction despite the associated entity and collusion rules.
98. In the alternative, ISED could set a consortium or joint bidding cap. This would restrict any entity or arrangement constituting more than one carrier to no more than 30 MHz as opposed to the 20 MHz cap applying to individual carriers. This cap would apply both during the auction, if the partners bid together, or after the auction, if they attempted to combine their holdings.

**Q1E**—ISED is seeking comments on its proposal to auction the set-aside spectrum as three separate paired blocks of 5+5 MHz.

99. Notwithstanding Rogers' strong recommendation that the Department decrease the set-aside spectrum from a total of 30 MHz to 20 MHz, Rogers supports auctioning the set-aside spectrum as paired blocks of 5+5 MHz. Auctioning the spectrum as separate paired blocks will allow for some competition for the set-aside spectrum while still allowing bidders to aggregate potential holdings into wider, contiguous blocks.

**Q2**—ISED is seeking comments on its proposal to use Tier 2 service areas across the country, except in the three Territories (Yukon, Northwest Territories and Nunavut) where Tier 4 service areas would apply.

100. Rogers supports the Department's proposal to use Tier 2 licence areas across the country, except in the three Territories. The use of these relatively large licence areas is consistent with the 700 MHz band, which has similar propagation

characteristics, and the fact that this spectrum will be used to implement wide area mobile services. This will result in less coordination being required between licensees and will allow for more effective use of the radio spectrum than would be the case if smaller licence areas were used.

101. Rogers also supports the use of Tier 4 licence areas for the Yukon, Northwest Territories, and Nunavut. Although the smallest of the four tiers used by ISED, they remain relatively large geographic areas in less populated areas of the country. The use of Tier 4 for the three Territories is also consistent with the 700 MHz band.

102. We note that the use of Tier 2 regions substantially addresses concerns regarding aggregation risk across regional boundaries, as the regions are large and populations at Tier 2 regional boundaries are modest. This is an important reason why a CCA may not be the best option for the 600 MHz auction (see discussion of auction format in our response to Q5).

**Q3**—ISED is seeking comments on:

- a. the proposal to use generic licences and;
- b. the proposal to categorize all blocks won by set-aside-eligible bidders as set-aside blocks.

103. Rogers supports the proposal to use generic licences in the auctioning process. For those bidders successful in acquiring more than one spectrum licence, the contiguity of that spectrum is of the utmost importance for maximizing the utility of the spectrum. The use of generic licences can guarantee spectral contiguity. In combination with the decision to use Tier 2 licensing, the use of generic lots substantially addresses concerns about aggregation and fragmentation risk for bidders, with the implication that a CCA may not be the best format for the 600 MHz auction (see our response to Q5).

104. Rogers also supports the proposal to categorize all blocks won by set-aside-eligible bidders as set-aside blocks. However, as proposed above in response to Q1D, the Department should extend the moratorium on the transfer of set-aside spectrum to all entities, including set-aside-eligible ones. Such a move will limit spectrum speculation and help ensure that the spectrum is obtained by operators who will move quickly to deploy services and benefit Canadian consumers.

**Q4**—ISED is seeking comments on:

- a. the use anonymous bidding during the auction; and
- b. the information that will be disclosed to bidders during the clock rounds, as described in annex A (which would also apply to the CCA with a modified activity rule set out in annex B) and annex C.

105. Rogers supports the use of anonymous bidding during the multiple round allocation phase of the 600 MHz auction. The approach of reporting excess demand but not identifying the demand of individual bidders provides a good compromise between promoting price discovery and making it more difficult for bidders to engage in gaming. We support this rule regardless of whether the Department proceeds with a CCA, or switches to a simpler format. In the following paragraphs, we provide additional comments specific to the CCA formats proposed by ISED.

#### **Information policy for standard CCA with WARP or GARP**

106. Rogers supports the use of anonymous bidding during the clock rounds of the auction. In the standard CCA with WARP-based or GARP-based activity rules, only information about aggregate demand should be made available to bidders after each round.

107. ISED further proposes to withhold information about aggregate demand in the final clock round. We disagree with this proposal. As we discuss in detail below, there is a growing literature that demonstrates that the CCA enables bidders to drive up prices of their rivals. Specifically, bidders may take advantage of information obtained during the clock rounds so as to identify high bid amounts for large packages which they know they will not win but may set prices for their rivals. In proposing to hide information about the last round, it appears that ISED hopes to make it more risky for bidders to behave in such a way. We applaud ISED's motive, but we think the rule is ineffective and unfair. Depending on how the auction evolves, some bidders may already have the information they need to engage in price setting strategies, while others do not. Bidders may also respond by bidding tactically in small regions to hold the auction open in an attempt to gain an information advantage over rivals (as may have happened in the previous Canadian 2500 MHz auction).

108. The fact that ISED is proposing to withhold information about aggregate demand in the last round is in itself evidence that ISED is concerned about spiteful bidding in the CCA. Simply not revealing information about aggregate demand is ineffective. The only way to properly address this serious problem is to move away from the CCA and adopt an alternative format that does not provide such incentives.

### Information policy for Enhanced CCA (ECCA)

109. The fact that ISED proposes to release information about aggregate demand in the final round in the ECCA suggests that it believes that the pricing rule in the ECCA addresses the potential for spiteful bids inherent in the CCA. As we discuss in our answer to Q5, this is far from the case. In fact, we fear that the pricing algorithm used in the ECCA in effect makes spiteful bids implicitly on behalf of bidders. We therefore urge ISED not to adopt the untested ECCA format. It is certainly not correct to claim, as ISED appears to do, that a significant advantage of the ECCA is that it avoids having to restrict aggregate demand in the final clock round.

**Q5**—ISED is seeking comments on:

- a. The advantages and disadvantages of the three auction formats being considered for the 600 MHz auction:
  - i. Combinatorial clock auction, using the WARP-based activity rule ([annex A](#));
  - ii. Combinatorial clock auction, using the GARP-based activity rule ([annex B](#));
  - iii. Enhanced combinatorial clock auction ([annex C](#)).
- b. Where there is a preference for one of the options, respondents are asked to provide a rationale and explanation.

### Proposed alternative auction formats

110. It is widely understood that there is no single best auction format for awarding spectrum. Regulators should pick the format that they think is most likely to fulfil their objectives based on a detailed evaluation of supply and demand conditions. The Department acknowledges that, “advancements in auction theory and design have led to new and improved auction formats and rules.”<sup>21</sup> Indeed, in recent years, regulators worldwide have advanced the rules for a broad range of formats, including the SMRA, clock auction and sealed bids, as well as combinatorial auctions.

111. Against this background, it is unclear why the consultation focuses only on one auction format, the CCA. The CCA is a controversial format for spectrum auctions. In Europe, as in Canada, it has been associated with high and asymmetric price outcomes, and allegations that outcomes were distorted by spiteful bidding. It is no coincidence that the four countries with the world’s highest spectrum costs – Canada, Austria, the Netherlands, and Ireland – have all used the CCA for major

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<sup>21</sup> ISED, *Consultation*, para 47.

spectrum auctions. In two of these countries, Austria<sup>22</sup> and the Netherlands,<sup>23</sup> bidder unhappiness with the conduct and outcomes of CCAs led to legal challenges. There is also a growing body of academic literature that has highlighted theoretical and practical flaws in the CCA design, especially in more complex settings such as an auction with many regional categories.

112. Rogers' preferred auction format is either a clock auction, modelled on the U.S. 600 MHz Forward Auction,<sup>24</sup> or a hybrid SMRA, modelled on the U.K. 2.3 GHz & 3.4 GHz auction.<sup>25</sup> These formats share key features with the CCA: they are multi-round auctions that support price discovery; they use generic lots; and culminate in an assignment round that guarantees frequency contiguity within regions. The key differences are that they do not support package bidding, and have simple and predictable winner and price determination rules. In particular, bidders simply pay the amount of their winning bids, which results in complete transparency about financial exposures throughout the auction, unlike the CCA.

113. We note that ISED claims that a benefit of the ECCA is that it better aligns the clock prices in a CCA with the eventual winning prices. However, it is far from clear how effective this alignment might be in practice. We note that there are no studies of the efficiency or effectiveness of this format. Nevertheless, it is highly surprising that ISED should identify lack of pricing transparency as a potential issue with two of its proposed formats (the CCA with WARP and GARP activity rules) and for this reason propose the complex and untested ECCA. Why not then consider simpler auction formats that would address this deficiency of the CCA by having simple 'pay as bid' rules within an open auction (such as with SMRAs, the simple clock auction and similar variants).

114. While the CCA format does address aggregation risk, this should not be a significant concern for bidders in this auction due to ISED's proposed use of generic lots and Tier 2 licence areas, which we strongly support. The CCA's limited advantage is therefore outweighed by its complexity and vulnerability to gaming and asymmetrical results.

115. In Table 4, we compare the CCA to the clock auction and hybrid SMRA based on four key criteria, consistent with ISED's own objectives for this auction. This

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<sup>22</sup> After the Austrian Multiband Auction in 2013, Three and T-Mobile challenged the award process in the Austrian High Court. See:

[https://www.rtr.at/en/inf/Stellungnahme\\_Multiband\\_Auktion/Multiband\\_Auction\\_2013\\_Comments.pdf](https://www.rtr.at/en/inf/Stellungnahme_Multiband_Auktion/Multiband_Auction_2013_Comments.pdf).

<sup>23</sup> After the Dutch Multiband Auction in 2012, Vodafone, KPN and T-Mobile challenged the CCA design in the Rotterdam court. See: <http://deeplink.rechtspraak.nl/uitspraak?id=ECLI:NL:RBROT:2014:7917>.

<sup>24</sup> A full set of rules including comments from the FCC regarding specific design decisions is provided in FCC, *Public Notice FCC 15-78*; <https://www.fcc.gov/document/fcc-establishes-incentive-auction-bidding-procedures>.

<sup>25</sup> A full set of rules is provided in Ofcom, 2017, *Public Sector Spectrum Release*;

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0025/78055/Public\\_Sector\\_Spectrum\\_Release\\_2-3\\_and\\_3-4\\_ghz\\_award.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0025/78055/Public_Sector_Spectrum_Release_2-3_and_3-4_ghz_award.pdf).



comparison highlights the substantial benefits of moving away from the CCA for this auction.

**Table 4: Comparison of Candidate Auction Formats**

	<b>CCA</b>	<b>Clock Auction</b>	<b>Hybrid SMRA</b>
<b>Fairness and transparency</b>	<ul style="list-style-type: none"> <li>• Risk of highly asymmetric price outcomes</li> <li>• CCA does not provide bidders with opportunity to “bid back” to challenge allocation before it becomes final. This has led to legal challenges in Europe</li> </ul>	<ul style="list-style-type: none"> <li>• Promotes symmetric pricing – all lots in same category have same price</li> <li>• Bidders always have certainty over potential outcome and payment exposure</li> </ul>	<ul style="list-style-type: none"> <li>• Promotes consistent pricing – all lots in same category have similar price</li> <li>• Bidders always have certainty over potential outcome and payment exposure</li> </ul>
<b>Aggregation risk</b>	<ul style="list-style-type: none"> <li>• Bidders are not exposed to aggregation risk</li> </ul>	<ul style="list-style-type: none"> <li>• Bidders exposed to limited aggregation risk</li> <li>• Not a major concern for the 600 MHz auction given use of generic lots and Tier 2 licensing</li> </ul>	<ul style="list-style-type: none"> <li>• Bidders exposed to limited aggregation risk</li> <li>• Not a major concern for the 600 MHz auction given use of generic lots and Tier 2 licensing</li> </ul>
<b>Bidder asymmetries and budget constraints</b>	<ul style="list-style-type: none"> <li>• Bidder asymmetries may translate into asymmetric price outcomes</li> <li>• Bidders with budget constraints at a severe disadvantage</li> </ul>	<ul style="list-style-type: none"> <li>• Bidder asymmetries less likely to distort price outcomes</li> <li>• Bidders can manage exposure to budget constraint</li> </ul>	<ul style="list-style-type: none"> <li>• Bidder asymmetries less likely to distort price outcomes</li> <li>• Bidders can manage exposure to budget constraint</li> </ul>
<b>Vulnerability to strategic bidding</b>	<ul style="list-style-type: none"> <li>• Vulnerable to spiteful bidding that is solely aimed at driving up rivals’ prices. This may lead to very inefficient allocations</li> </ul>	<ul style="list-style-type: none"> <li>• Bidders may have limited demand reduction incentives; this could reduce revenues but avoids outcomes where one bidder wins a large number of lots</li> </ul>	<ul style="list-style-type: none"> <li>• Bidders may have limited demand reduction incentives; this could reduce revenues but avoids outcomes where one bidder wins a large number of lots</li> </ul>

**ISED’s auction format proposals**

116. If ISED remains committed to the CCA format, then a full assessment of the merits of each of the three CCA variants is necessary. Rogers is strongly supportive of ISED’s goals of encouraging truthful bidding, and promoting a fair and efficient

allocation of spectrum.<sup>26</sup> However, we do not agree with some of the claimed advantages and disadvantages of the various approaches.

117. We have analysed carefully the modifications to the standard CCA put forward by ISED in the consultation document. Overall, we consider that the CCA with a GARP-based activity rule is the most appropriate CCA format. This is rooted in the approach adopted in the AWS and 2500 MHz auctions, but the greater imposition of consistency in bidding should constrain strategic bidding more than the WARP approach. We strongly oppose the adoption of the ECCA, as it is not acceptable to set prices based on hypothetical rather than actual bids, especially given the absence of any caps. This would result in winning prices potentially determined by rivals' losing bids for large numbers of lots, where the bid amount would reflect possible anti-competitive motives in cornering the available spectrum and distorting competition in the marketplace.

118. As a general comment, we consider that all these rules add needless complexity. As discussed above, ISED would be far more likely to realise its objectives if it reverted to a non-combinatorial auction format, such as the hybrid SMRA or clock auction. These formats can also be run with partial transparency, i.e. aggregate demand revelation but no information about individual bidders. In these cases, there is no need to restrict information about bids in the final round, as this is the end of the auction, so governance is more straightforward.

### **The drawbacks of WARP**

119. Reviewing the proposed CCA format with WARP, a clear disadvantage of the activity rules proposed is that it is possible to bid strategically to affect clock prices and so relax constraints that arise in the clock rounds. This is typically possible towards the end of the clock rounds when a bidder can affect the evolution of clock prices by shifting its demand between service areas (while maintaining eligibility).

120. This issue is not just theoretical. It is observable in the bid data from the 2015 auctions. It demonstrates that the WARP activity rules as proposed do not sufficiently constrain bids to be consistent across rounds, as bidders may be able to use eligibility-maintaining bids to manipulate clock prices and WARP constraints so as to exaggerate future price setting power. Therefore, the WARP rules may in practice allow for significant revisions in a bidder's set of valuations for packages provided that bidder bids in a sufficiently sophisticated manner.

### **GARP, with modifications, is the preferred method**

121. A GARP activity rule would impose constraints on a bidder's choice of package during the clock rounds and on the bid amounts they can express in the supplementary round. If bidders bid straightforwardly based on preset valuations,

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<sup>26</sup> ISED, *Consultation*, para 69.

and have no budget constraints, this should have no impact on outcomes. Thus, the effect of GARP is to further constrain the ability of bidders to deviate from straightforward bidding. The key question, therefore, is whether this could offer more benefits than costs in the context of the 600 MHz auction.

122. Constraining bidders could be a good or a bad thing, depending on why a bidder wishes to deviate from pre-set valuations. For example, if a bidder wishes to deviate because it has changed its valuations, as part of the price discovery process, then GARP could impose constraints that preclude an efficient outcome. Alternatively, if the deviation is aimed at inflating prices for rivals, GARP might preclude such strategic behaviour. A further problem with tightening activity rules is that if bidders make mistakes, they may be permanently prevented from recovering their position, resulting in missing bids and reduced outcome efficiency.<sup>27</sup>

123. Looking back at the 700 MHz and 2.5 GHz auctions reveals that a GARP rule would have prevented some bids. As Table 5 shows, if GARP had applied in the 700 MHz auction, 134 bids (90% of all relaxed bids) would have been rejected. The impact on the 2500 MHz auction (Table 6) would have been smaller, with just nine bids and one bidder affected. Rogers was one of the bidders that submitted relaxed bids in the 700 MHz auction. We did so because we adapted our valuations, based on new information about the likely outcome, in particular the observation that Bell and Telus appeared to be pursuing spectrum in both the upper and lower bands. Indeed, we would have liked to have changed our bids even further, but were constrained by the WARP rules.

**Table 5: GARP violations in the 700 MHz auction**

	Feenix	MTS	Bragg	Telus	Videotron	Novus	TBayTel	Bell	SaskTel	Rogers
<b>Number of relaxed bids:</b>	3	0	1	14	75	0	0	8	1	45
<b>Invalid (GARP):</b>	0	0	1	11	69	0	0	8	1	44

<sup>27</sup> See, for example, a discussion of this problem in: Christian Kroemer, Martin Bichler and Andor Goetzendor, *(Un)expected Bidder Behavior in Spectrum Auctions, About Inconsistent Bidding and its Impact on Efficiency in the Combinatorial Clock Auction*, January 2015.

**Table 6: GARP violations in the 2500 MHz auction**

	Videotron	Xplornet	Corridor
<b># of relaxed bids:</b>	3	3	15
<b>Invalid (GARP):</b>	0	0	9

**Note:** Only three bidders submitted relaxed bids in this auction.

124. A key point here is that straightforward and truthful bidding are not necessarily the same thing. As we did in the 700 MHz auction, bidders may have legitimate reasons to change their valuation structures. For the 700 MHz auction, GARP would have been a bad rule because it imposes a high degree of preference consistency. GARP would not have allowed for much revision of package valuations in the course of the clock rounds, negating the benefit of an open auction in mitigating common value uncertainty.

125. Turning to the 600 MHz auction, we think the case for GARP is stronger. Unlike the 700 MHz auction, which had two sub-bands and lots with different characteristics and values within the lower sub-band, this auction comprises a single band and seven equal value lots. Accordingly, the likelihood that a bidder may want to deviate from a straightforward valuation structure should be smaller. ISED may therefore put greater relative weight on the benefits of precluding strategic bidding, which might involve, say, shifting demand between regions in an effort to manipulate relative prices. It should be noted, however, that GARP only prevents inconsistent bidding; it does nothing to address the broader problem with the CCA that it may incentivise bidders to exaggerate their demand for larger quantities of spectrum in a consistent manner to drive rivals' prices; this is still possible under GARP.

126. On balance, if ISED is determined to use a CCA for the 600 MHz auction, then we would support a shift to GARP for this specific award. However, for the avoidance of any doubt, this support for GARP should not be taken as support for the ECCA proposal, where we consider that the pricing rule reflects an unwarranted zeal to raise revenue, rather than efficiently allocate spectrum.

### **Strategic bids for open lots**

127. While the GARP activity rules (in both the CCA and ECCA proposals) is clearly superior in terms of restricting behaviours intended to relax WARP constraints, it is not a panacea. Even with GARP, we would still need a rule to ensure that set-aside-eligible bidding is preferentially for set-aside spectrum before non-set-aside-eligible spectrum to prevent price driving.

128. In the context of the proposed set-aside, a particular concern is that set-aside-eligible bidders might choose to bid for open lots instead of set-aside lots in order to maintain their future bid options. Later in the auction, when there is some risk of the clock rounds closing, they would then switch from open lots to set-aside lots.

However, eligibility reductions would occur with them bidding for open, rather than set-aside, lots. Because the clock price of open lots is required by the auction rules to be above the clock price of corresponding set-aside lots, this must provide set-aside-bidders with greater future bid options than would straightforward bidding. This is true for both WARP and GARP rules.

129. We consider that this strategy would become obvious to set-aside-eligible bidders and we would expect such behaviour to occur. It would be quite wrong for the Department to proceed with a set of rules that is so obviously likely to give rise to distorted bid incentives. This issue could be simply addressed by our proposed amendment to the bidding rules to require set-aside-bidders to bid preferentially for set-aside lots where these were strictly cheaper than the corresponding open lots.

### **The ECCA format has significant flaws**

130. The ECCA is governed by broadly similar activity rules to the GARP CCA but aims to increase the accuracy with which clock prices will approximate eventual winning prices. We note that this approach is completely untested. It is not at all clear how accurate clock prices are likely to be in practice as there is no guarantee that winning prices will necessarily reflect the calculated discounts in cases with unsold lots.

131. One of the many drawbacks of the CCA is outcome uncertainty for bidders in the course of the clock rounds, sometimes with respect to allocation and almost always with respect to price paid. As we understand it, the ECCA has been proposed as an alternative to the CCA that provides bidders with greater certainty over price outcomes. From a governance perspective, greater outcome certainty is obviously beneficial to bidders. However, this problem could alternatively be addressed by reverting to a non-combinatorial, pay-your-bid format, such as the clock auction or SMRA (or similar variant). We see no other benefits from the ECCA and a host of potential concerns (which we set out below). Accordingly, we strongly oppose the adoption of the ECCA for this auction.

132. The ECCA proposal is most likely to increase spectrum prices, which has been shown to negatively affect competition, capital available for deployment, and consumer affordability. The pricing formula operates as if rival bidders had made bids within the activity rules to maximise the opportunity cost faced by each winner but without those rival bidders actually needing to make the bids. This is particularly troublesome given the lack of any caps.

133. It took the academic community almost a decade to start to understand the gaming incentives that the standard CCA provides and a full understanding is still lacking. The ECCA has not received any academic scrutiny so far. It has been mentioned in one paper so far, but we are unaware of any academic research that analyses the bidding incentives in the ECCA. The lack of academic scrutiny and lab testing of this

format is a key concern. Entrusting the allocation of a valuable and scarce resource to an auction format that is not well understood at this point carries significant risk of auction failure. At the same time, the ECCA does not provide any benefits over the CCA other than possibly if ISED had an improper objective of raising revenue over and above a reasonable market price for spectrum.

134. The claim that an advantage of the ECCA is that allows for full disclosure of excess demand in all clock rounds, including the final clock round, is misplaced. In both the 700 MHz and 2500 MHz auctions, the clock rounds drew to a close with excess demand being resolved in all but very minor regions; ending excess demand in these minor regions then closed the clock rounds. As we discussed in our answer to Q4, whether or not final demand is revealed in any version of the CCA is unlikely to be material to addressing concerns about price driving behaviour.

**Q6**—ISED is seeking comments on:

- a. The proposal that winners of more than one block in a single service area be assigned contiguous blocks; and
- b. The proposed structure of the assignment stage, including the order of the assignment rounds and the combination of service areas into a single assignment round.

135. Rogers supports the proposal that winners of more than one block in a single service area be assigned contiguous blocks. As the Department itself recognizes, “contiguous spectrum is generally more efficient, and thus preferable to fragmented spectrum”.<sup>28</sup> Wide channels of contiguous spectrum are desirable to provide the higher speeds and capacity to users that Canadians have come to expect and demand.

136. Rogers further supports the proposal to conduct the assignment stage in sequential rounds, service area by service area, in descending order of population. By assigning two or more service areas in a single assignment round when the service areas form a contiguous geographic area, and the winners and the number of licences they have won are the same in the considered service areas, the benefits of contiguous spectrum are enhanced.

137. Rogers also supports the general principle of using a sealed bid, second price auction format to assign specific frequencies to winning bidders. This is a tried and tested format that works well whenever the value differences between lot placements are expected to be small. However, there is a major flaw in the proposed

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<sup>28</sup> ISED, *Consultation*, para 78.

ISED design, which is that it ignores the value to bidders from being next to actual or potential partners. The design must be adapted to eliminate any incentive for bidders to try to block rivals from being co-located.

138. In the assignment round, synergy values come from two sources:

- i. **Technical value.** In some bands, there are differences in the value of specific frequency blocks, for example owing to differences in interference vulnerability.
- ii. **Strategic value.** Companies may have strong preferences regarding their neighbours. As they run a joint network, Bell and Telus likely place a large premium on being co-located. Similarly, other bidders may prefer to be co-located, so they also retain an option to share spectrum in the future. Meanwhile, “new competitors” generally prefer to be next to established operators (and vice versa), so they have a future option to trade spectrum.

139. For the 600 MHz auction, technical value is negligible but strategic value is potentially high. For example, in the case that a bidder won only a single 5+5 MHz block, the value of that block would be much higher if it was adjacent to a potential network or trading partner. Conversely, other parties may place a premium on separating the small winner from its strategic partner, as to foreclose such a deal or position itself as the only partner. For example, in the 700 MHz auction, it appears that Bell and Telus bid both in the upper and lower bands in order to divide the remaining bidders and preventing any network sharing.

140. Given that the assignment bidding process is conducted anonymously and it is very hard to value future options, the risk of an inefficient assignment outcome from a strategic perspective is substantial. Fortunately, the strategic preferences of bidders are predictable, so it is possible for ISED to adapt the rules both to eliminate risk of not being next to a potential partner where this is desirable and to eliminate potential anti-competitive behaviour to foreclose such options. In particular, we favour rules that (a) in case network partners bid separately, they are guaranteed contiguous assignment; and (b) preclude network partners, whether bidding separately or together, from inserting themselves between other winning bidders.

141. Consistent with the Department’s policy to allow network sharing in order to achieve the potential benefits of providing better economics that can result in broader coverage and more advanced services in rural areas, the Department should consider additional measures to enhance contiguity between clock round winners. We outline three approaches that ISED could adopt to address this problem:

- i. **Place established national operators at either end of the band.** Under this approach, Bell-Telus and Rogers, in regions where they have winning bids,

would automatically be assigned to separate ends of the entire 70 MHz spectrum band, with other bidders located between them. Bell-Telus and Rogers could compete in a single assignment round at the start to determine whether they are at the top or bottom. On a region-by-region basis, if there are multiple other parties that win spectrum, they could participate in a bidding round to determine where they are located in the middle of the band. Such an approach could benefit downstream competition by providing the greatest strategic options for newer networks to either explore partner sharing with national networks or other regional operators.

ii. **Additional rule on bid options for winning bidders.** Under this approach, certain categories of bidders are given the option to reject potentially undesirable assignment outcomes, which are then excluded from the winner determination. Specifically, we propose that:

- On a region-by-region basis, existing network share partners have the option to bid as a single entity in the assignment round.
- Any bidder winning only 5+5 MHz in a region (or group of regions) be given the option to reject assignment options that would place it at the end of the band. In this way, such a bidder knows that if they win only 5+5 MHz in the main auction, they will have more than one future partner option.
- In the case that both national network operators (i.e. Bell-Telus and Rogers) each win more than 10+10 MHz, any “new competitor” that wins spectrum in the region would have the option to reject assignment options that would place it at the end of the band.<sup>29</sup> The rule prevents either Bell-Telus or Rogers blocking each other from being adjacent to a new competitor.

iii. **Allow multiple bidders to bid as a coalition in the assignment round.** Under this approach, all winning bidders are given a short period of time following the conclusion of the supplementary round to form an assignment round coalition that is treated as one entity during the assignment round. A similar approach was used successfully in the 3.6 GHz spectrum auction in Ireland.<sup>30</sup> In this way, bidders can shield themselves from assignment round risk that future agreements between operators are not viable owing to non-contiguous spectrum.

To facilitate this process, the prohibition on bidders talking to each other in the auction would need to be lifted following announcement of results from the principal stage. This should be acceptable, as there would no longer be the possibility of bidders colluding to change the allocation outcome or principle

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<sup>29</sup> We suppose that SaskTel would be excluded from this option, as it – like Bell, Telus and Rogers – is an established player.

<sup>30</sup> A full copy of the Information Memorandum can be found on Comreg’s website at:

<https://www.comreg.ie/publication/3-6-ghz-band-spectrum-award-information-memorandum/>



stage prices. Allowing coalitions in the assignment round may also reduce assignment pricing competition; however, as assignment revenues are not significant with respect to overall auction revenues and the priority is efficient assignment, this should not be a concern for ISED.

142. Any of these three options would be acceptable to Rogers.

**Q7**—ISED is seeking comments on the proposed methodology for incrementing prices during the clock rounds, as described in annex A.

143. The price increment rules that ISED proposes in the consultation creates a price linkage between the open spectrum and the set-aside spectrum, such that the open spectrum can never be cheaper than the set-aside. This by itself is acceptable. However, there appears to be nothing to stop an entrant from bidding for non-set-aside spectrum when the set-aside spectrum is in fact cheaper. This opens up the possibility of entrants either parking demand in open spectrum or deliberately driving up the price of non-set-aside spectrum for strategic reasons (price setting), as they did in the 2008 AWS auction.

144. To address this problem, if a set-aside of any size is adopted, we propose a fair bidding rule. This would involve putting in place bidding restrictions on set-aside-eligible bidders that ensure that such a bidder always bids for the cheapest option. As the set-aside and the open spectrum are perfect substitutes, there is no reason for such a bidder to ever bid for the more expensive option, unless there is not enough set-aside spectrum to fill their demand. We believe that this rule could be applied to any candidate formats, i.e. the clock auction, hybrid SMRA or CCA. Adding this rule would not require any revision of the price adjustment rule, although, it would have implications for the price dynamics.

145. In the context of a CCA, we recognise that a GARP activity rule makes such behaviour more difficult but does not eliminate the possibility of abusive bidding. As our proposed bidding restriction simply imposes a requirement that set-aside-eligible bidders treat the set-aside and the open category as perfect substitutes, the restriction has no impact on the ability of set-aside-eligible bidders to express their demand even under a GARP activity rule. Our proposed rule would work as follows.

146. In the clock or SMRA rounds:

- If set-aside spectrum is cheaper than open spectrum in a region, set-aside bidders must bid in the set-aside category and are only allowed to express demand over and above the total available set-aside quantity in the open category; or

- If the price of set-aside spectrum is equal to or greater than the open category, set-aside-eligible bidders would be able to place bids for lots in either category.

147. In the supplementary round (if applicable):

- Bidders that are eligible to bid for set-aside spectrum must submit bids that prioritise meeting their demand with set-aside spectrum to the maximum extent possible before adding non-set-aside spectrum.
- Any such bidder that submits a bid containing set-aside spectrum is automatically deemed to have submitted bids containing the same amount of spectrum by category for all feasible combinations of set-aside and non-set-aside spectrum *at the same price*.

148. Importantly, these rules would not constrain a set-aside bidder who engages in straightforward bidding. We therefore believe that they are an unambiguous improvement to the rules for any auction format in which a set-aside of any size is implemented.

**Q8**—ISED is seeking comments on the proposed Affiliated and Associated Entities rules that would apply to bidders in the 600 MHz auction.

**Q9**—ISED is seeking comments on the proposed rules prohibiting collusion and other communication rules, which would apply to bidders in the upcoming 600 MHz auction.

149. The Department should carefully evaluate and take all the necessary steps to ensure any affiliated and associated entities rules promote a fair and efficient outcome in current and future auctions or any licensing processes. Rogers further believes that the Department must integrate its policies and auction rules regarding collusion and affiliated and associated entities within a single framework, including spectrum aggregation limits, to ensure that unintended consequences do not benefit one or more bidders in auctions.

150. The purpose of the associated entity and collusion rules is to ensure a fair auction in order to achieve ISED's ultimate goal of a competitive wireless industry. Every carrier must stand equal and have the same opportunity to successfully bid for and win spectrum. If some carriers can circumvent the rules, then that advantage will carry into the marketplace.

151. The ability to compete fairly in the auction is compounded by the limited amount of spectrum available. With at least four bidders in every region, each seeking at least 20 MHz, the available 70 MHz will be squeezed. Demand will exceed supply. This is

exacerbated by the 30 MHz set-aside which artificially constrains supply even further. National carriers will be seeking at least 60 MHz when only 40 MHz is made available. New entrants will make bids in the open blocks too.

152. The problem before ISED is how to maximize the possibility that every carrier who requires 600 MHz spectrum will have a realistic opportunity to receive it. Failure to do so will have significant competitive repercussions. Under the current framework, with a 30 MHz set-aside and no cap, it is distinctly possible that there will only be two winners in this auction – a single set-aside winner and a single open block winner. Such an outcome will distort the market and hurt consumers. It certainly will not help ISED achieve its policies.
153. Moreover, the spectrum scarcity will also affect bidder relationships and bidding behaviour. The limited supply of spectrum will place more pressure to form new or extend existing network sharing arrangements. Being able to combine spectrum to create economically feasible blocks is a tremendous advantage when there is a limited amount. Combining balance sheets to increase bidding strength creates further advantages. Whether formed before or after the auction, the impact of the network sharing arrangement will be the same – incumbent carriers who have such arrangements before the auction, or are thinking of doing so afterwards, will seek to coordinate their bids. This will further increase the likelihood that only a small section of bidders, perhaps only two of them, will win any 600 MHz spectrum
154. On their own, the associated entity and collusion rules cannot prevent this outcome. Over the last four auctions, related carriers have been freely allowed to bid separately. Furthermore, Rogers believes coordinated bidding has been witnessed repeatedly. The same bidding patterns emerge time and time again. There is no need to collude if you already know exactly where you need to bid and where your partner, or likely partner, has to. While the rules prevent overt cheating, Rogers has little confidence in them to prevent coordinated bidding.
155. ISED must therefore use the entire auction framework to prevent such behaviour and avoid any monopolization of the 600 MHz spectrum. The associated entity and collusion rules are intrinsically tied to the spectrum aggregation limits, and they must be designed in conjunction with one another and not in isolation. For example, without a spectrum cap, the associated entity rules carry little weight. Being designated associated entities will not harm incumbent network sharing partners as they can obtain all the spectrum they want as a single bidder. In fact, they will be able to better coordinate their bids than if they bid apart. At the same time, Rogers believes the collusion rules are ineffective in preventing coordinated behaviour between related parties even when bidding separately. Long-standing network sharing partners already have well developed bidding strategies and no collusion is necessary to achieve their auction goals. They each know exactly what to do without

breaking any rules. These rules are ineffective on their own. They must be tied to effective spectrum aggregation rules.

156. That is why, as already recommended, there must be a 20 MHz spectrum cap. Only that will provide a fair bidding playing field. Otherwise, without one, incumbent network partners can accept becoming associated entities and bid together with more bidding power than other bidders. As a single bidder, they can also ignore the anti-collusion rules. Together, a joint bidder could dominate the auction and monopolize the spectrum. The cap would therefore prevent more coordinated behaviour between related incumbent bidders than both the associated entity and anti-collusion rules combined.
157. The 20 MHz cap however is not enough. Over the last two CCA auctions, Rogers believes there has been plenty of coordinated bidding even with caps. Carriers simply avoid coming to any agreement for the specific spectrum being auctioned, allowing them to bid separately, all the while knowing exactly how their partner will bid due to their existing network relationship. They then combine spectrum after the auction. ISED should therefore consider two solutions to avoid this practice: strengthen the associated entity rules and limit the transferability of the licences after the auction.
158. To begin with, the associated entity rules should be amended to recognize existing relationships between the national carriers. The current rules only capture entities who have specifically agreed to share the 600 MHz spectrum. That is easily avoided. Joint network partnerships between incumbent carriers do not have to make any such agreement. As explained above, they already understand where to bid based on their existing spectrum sharing arrangement. To be effective, the associated entity rules should capture incumbents already sharing spectrum.
159. This was already done in Denmark. They recognized the effect of existing network sharing relationships and forced them to bid together going forward. The Danish auction rules state:
- “Commitment 3: In the future, the parties are obliged to buy frequency licenses in common (through the joint venture). This will avoid a situation where the parties buy spectrum separately and afterwards pool the obtained frequency resources in the joint venture, thus gaining access to an overall larger amount of spectrum.”<sup>31</sup>
160. In addition, ISED should restrict the transferability of licences between licence holders in the future. As previously explained, if licence holders wish to combine spectrum after the auction, they should not be allowed to combine more than 30

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<sup>31</sup> DCCC, *Denmark: Network Sharing Agreement in Danish Mobile Telecommunications Sector*; [http://ec.europa.eu/competition/ecn/brief/02\\_2012/dk\\_mobile.pdf](http://ec.europa.eu/competition/ecn/brief/02_2012/dk_mobile.pdf).

MHz. Any surplus spectrum must be returned to ISED. This will prevent any unwritten agreements from skewing the auction.

161. These changes are essential. Without caps and improved associated entity rules, there is a real danger that this crucial resource will end up in a limited number of hands and hurt competitiveness. ISED must ensure every bidder has a fair chance to win spectrum.

**Q10**—ISED is seeking comments on its proposal to issue spectrum licences in the 600 MHz band with a 20-year licence term and the proposed wording of the condition of licence above.

162. Rogers supports the Department's proposal to license the 600 MHz band for a 20-year term and that the licensee will have a high expectation that a new licence will be issued for a subsequent term through a renewal process. 20-year terms are consistent with licence terms for recent spectrum auctions and renewed spectrum licences. This approach provides licensees with a greater degree of certainty with respect to the ongoing viability of their operations, for network planning purposes, and in order to secure additional funding for their substantial ongoing investments. This will be vital for the 600 MHz band, which may be used for deployments of advanced 4G LTE technology or pioneer 5G technologies still under development.

163. The Department should take a very cautious approach when exploring opportunistic access so as not to negatively affect the advanced mobile networks that already provide connectivity to digital technologies and services that is a defining feature of the digital economy.<sup>32</sup> Opportunistic sharing technology is still years away from commercial deployment and has substantial technical, regulatory, and business challenges to overcome before it can become a reality.

164. Once these technical challenges have been solved, trials should be restricted to bands with open spectrum designations, lightly licensed mobile bands or bands with limited users in restricted geographic areas that will be protected from interference. This will allow the Department to trial new spectrum management technologies and policies in bands that do not pose large risks to incumbent licensees and the extensively deployed communications infrastructure already providing advanced connectivity to Canadians. The Department should also recognize the large amount of spectrum already available for unlicensed use vis-à-vis the much smaller amount of licensed cellular mobile radio spectrum.

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<sup>32</sup> Rogers, *Comments on Consultation on a Licence Renewal Process for Advanced Wireless Services and other Spectrum*, para 17.

165. Once trials have proven successful and stakeholders have a better understanding of the implications of the technology, the Department should launch a comprehensive consultation process to ensure such a fundamental change in spectrum planning and usage is in the public interest. Licensees have spent over \$14 billion at spectrum auctions since 2001 on acquiring exclusive licences and more than an estimated \$2.3 billion in spectrum fees since 2004.<sup>33</sup> The total amount of the proposed opening bids for the 600 MHz spectrum nationwide is \$1.537 billion, with the actual amount spent likely to be much higher. Licensed operators have invested a further \$44.8 billion since 1985 to construct world class networks and infrastructure to service Canadians.<sup>34</sup> Canadian wireless providers must clearly understand all of their rights, obligations and terms of licence upfront.

**Q11**—ISED is seeking comments on the proposals on the condition of licence related to transferability and divisibility, and the proposed wording above.

166. Notwithstanding Rogers' general opposition of set-asides, we support the Department's proposal that would provide a five-year moratorium on the transfer of set-aside spectrum to a set-aside-ineligible entity. However, as stated above in Q1D, the Department should extend this moratorium on the transfer of set-aside spectrum to all entities, including set-aside-eligible ones. Combined with the mid-term deployment requirements, as discussed below in Q12, such an action will help deter spectrum speculators and ensure the spectrum is available to provide service to Canadians.

167. Rogers also supports the Department's proposal to make 600 MHz licences divisible in both bandwidth and geographic dimensions, subject to ISED's approval, though primary licences should not be divisible below a Tier 3 level (i.e. Tier 4 or smaller). Tier 3 service areas will minimize interference risks to established networks that coordinating low-band mobile spectrum on a Tier 4 (or smaller) level could bring. Rogers has extensive first hand experience dealing with wireless interference challenges between its joint venture Inukshuk Wireless Partnership's network and small, regional operators in the 3.5 GHz band. Licensing 600 MHz spectrum at a Tier 4 (or smaller) level with spectrum that has even stronger propagation characteristics would increase the complexity, number and severity of service area interference risks for a spectrum band that Canadians will come to rely on. The use

<sup>33</sup> ISED, *Spectrum Auctions*; [http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h\\_sf01714.html](http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01714.html). Note: \$14B is nominal and does not account for inflation. Spectrum fees calculated based on industry holdings.

<sup>34</sup> CWTA, *Facts & Figures: Investment and Job Creation in Canada*; <https://www.cwta.ca/facts-figures/>.

of Tier 4 areas would therefore result in a less efficient use of this valuable spectrum.

**Q12**—ISED is seeking comments on the proposed deployment condition of licence as stated above.

168. Rogers supports the Department’s proposed deployment condition of licence, which will “encourage licensees to put the spectrum to use and to deter acquisition of spectrum licences by speculators and those whose intent is to preclude access to the spectrum by their competitors.”<sup>35</sup> Rogers agrees with the Department’s statement that, “mid-term deployment requirements would help to ensure that deployment progresses across all licence areas throughout the licence term.”<sup>36</sup>

169. However, the Department should clarify that for any Tier 2 licence that does not meet underlying Tier 3 (Year 10) or Tier 4 (Year 20) deployment requirements, the licensee will be renewed in all underlying Tier 3 or Tier 4 service areas that meet or exceed deployment requirements by the deployment timelines and only those that do not would be returned to ISED.

170. Rogers submits that should ISED retrieve any such Tier 4 licence blocks that it take into account the propagation characteristics of the 600 MHz spectrum. As the Department is aware, 600 MHz spectrum travels great distances. ISED cannot take back a Tier 4 area then licence it to another party if it would result in interference to the original’s carriers operations in abutting areas.

**Q13**—ISED is seeking comments on proposed conditions of licence outlined in annex G that would apply to licences issued through the proposed auction process for spectrum in the 600 MHz band.

171. Rogers generally supports the Department’s proposed conditions of licence as outlined in annex G and that would apply to 600 MHz spectrum licences issued through the proposed auction.

172. With respect to lawful interception, it is important to note that mobile spectrum licensees, such as Rogers, have a long history of cooperation with law enforcement and security agencies, subject to appropriate legal processes and judicial oversight.

<sup>35</sup> ISED, *Consultation*, para 132.

<sup>36</sup> ISED, *Consultation*, para 134.

Moreover, Rogers' significant investment in the technology, resources and expertise that are required to support lawful interception activities is a substantial benefit that accrues directly to the Canadian public.

173. However, Rogers strongly believes that any lawful interception obligations, imposed as a condition of licence or pursuant to legislation, should be limited to capabilities that are provided for in industry standards and incorporated in commercially available equipment. Licensees should not be required to fund intercept capabilities that are not provided for in industry standards and commercially available equipment.
174. Technology vendors will be more likely to build equipment based on industry standards because this will generally be more economic than building unique or proprietary solutions for which there will be relatively limited demand. Defining lawful intercept requirements based on industry standards will result in greater availability of technology, better on-going support, and lower cost than non-standardized requirements.
175. We believe that the Department should clarify the proposed wording of the condition of licence such that the lawful interception capabilities that must be maintained will be limited to those capabilities that are provided for in industry standards and incorporated in commercially available equipment.
176. The research and development ("R&D") condition of licence has served its purpose and should be phased out. As the Department has noted elsewhere, this condition of licence was initially established to stimulate R&D in the telecommunications sector when the first mobile spectrum licences were issued in the mid-1980s.<sup>37</sup> Since then, billions of dollars have been invested in R&D and the mobile industry in Canada is well established. This condition has therefore achieved its objective and is no longer required.
177. Rogers agrees with the *Telecommunications Policy Review Panel Final Report* and the *OECD Telecommunications Regulatory Institutional Structures and Responsibilities* report, which cautioned against the mix of regulation and industrial development strategy.<sup>38</sup> The Department has other alternatives for encouraging R&D in Canada. We would also note that the U.S., U.K. and Australia do not impose an R&D condition of licence and Rogers is not aware of any other jurisdiction that imposes such a condition of licence. Market forces will ensure that wireless equipment manufacturers and licensees will continue to invest heavily in R&D to enhance their competitive position.

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<sup>37</sup> ISED, *Consultation on Revisions to the Framework for Spectrum Auctions in Canada*; <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09371.html#DGRB00109.06.1>.

<sup>38</sup> Ibid.



178. As was highlighted in the Department's recent *Consultation on a Licence Renewal Process for Advanced Wireless Services and other Spectrum*, in recent years the Canada Revenue Agency (CRA) has changed its rules as to what qualifies as SR&ED spending. As a result, a certain amount of labour and capital expenditures are no longer eligible to be claimed as SR&ED. These CRA changes have made it even more difficult for wireless carriers, as they can no longer claim certain activities as SR&ED while the 2% revenue requirement itself continues to grow. This forces licensees to invest in a shrinking prescribed list of R&D activities to meet guidelines, reducing capital available for needed investments. These are some of just a few of the challenges of this condition of licence that also result in a large administrative burden associated with the gathering, auditing and generating of R&D reports. It further demonstrates why this mix of regulation and industrial development strategy is no longer good policy.
179. As a result, Rogers supports calls to eliminate the R&D requirement. At a minimum, Rogers proposes to reduce the 2% requirement to a much lower percentage. A lower percentage would make it less difficult for licensees to meet the requirement despite the CRA rule changes that limit eligible SR&ED claims. As an alternative, Rogers would recommend the implementation of a cap on the 2% R&D requirement. Once the 2% reaches a certain revenue threshold (for example \$100 million), the licensee's 2% of adjusted gross revenues is capped at that level and cannot increase. The cap would prevent the R&D requirement from distorting the marketplace and the investment decisions of licensees and thereby free up more capital to invest in the expansion of wireless coverage in remote areas and in 5G services.
180. The Department should modify the annual reporting condition of licence in order to help reduce administrative burdens for both the Department and licence holders. Current annual reports consume significant regulatory and engineering resources within wireless operators to generate and appear to provide uncertain value for ISED at such a high frequency. Alternative models for reporting requirements could involve moving to an "as-requested" model, where carriers are only obligated to provide only those documents specifically requested by ISED each year or increasing the length of time between the provision of certain reports. Such a move would reduce the administrative burden on operators, as well as the Department, while still ensuring ISED can adequately monitor spectrum licensees to fulfill its mandate.
181. Rogers supports the mandatory roaming condition of licence. Client Procedures Circular (CPC) 2-0-17 *Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements* covers important areas not duplicated by the CRTC Telecom Regulatory Policy 2015-177, including the mandated roaming requirement itself. CPC-2-0-17 further includes a roaming request process backed-up by commercial negotiation timelines and

arbitration if the two parties cannot come to a roaming agreement. This end-to-end process benefits millions of Canadian mobile customers by balancing the objective of encouraging the “deployment of advanced networks that provide the greatest choice of basic and advanced services available at competitive prices to the greatest number of Canadians”<sup>39</sup> with the fact that operators may require access to wholesale roaming services on a reasonable basis as they continue to expand their networks in an orderly manner.

182. ISED must work with the CRTC and all levels of government to ensure carriers have access to the poles (hydro and telecom), ducts, streetlights, and municipal property that are needed to place antennas and wires. Backhaul will be crucial to 5G and carriers must be able to deploy the necessary trunks and dishes.

**Q14**—ISED is seeking comments on the proposed opening bids as presented in table 1.

183. Rogers supports the Department’s proposed opening bids as presented in the Consultation table 1.

**Q15**—ISED is seeking comments on the proposed eligibility points for spectrum licences in the 600 MHz as outlined in table 2, and pre-auction deposits as outlined above.

184. Rogers supports the Department’s proposed approach to setting eligibility points for spectrum licences in the 600 MHz auction, and pre-auction deposits as outlined above.

185. However, Rogers also proposes that, as was done in the AWS-1 auction, the Department make public prior to the commencement of bidding the identities of all bidders, the licences on which they are qualified to bid, and their initial levels of eligibility points.<sup>40</sup> Revealing this information will assist price discovery in the auction, making it easier for bidders to interpret competitive dynamics and refine valuations in each service area, and promoting a level playing field across participants.

<sup>39</sup> ISED, CPC-2-0-17 — *Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements, Issue 1*; <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10563.html#Roaming>.

<sup>40</sup> ISED, *Licensing Framework for the Auction for Spectrum Licences for Advanced Wireless Services and other Spectrum in the 2 GHz Range*, Section 6.1; <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08862.html#sect61>.

**Q16**—ISED is seeking comments on the proposed renewal process for spectrum licences in the 600 MHz band.

186. Rogers supports the Department's proposal that licensees will have a high expectation of renewal at the end of the initial licence term. It is essential that licensees that comply with their licence conditions have the certainty needed to make the significant investments required to deploy advanced wireless networks.

187. However, the Department should clarify that for any Tier 2 licence that does not meet underlying Tier 3 (Year 10) or Tier 4 (Year 20) deployment requirements, the licensee will be renewed in all underlying Tier 3 or Tier 4 service areas that meet or exceed deployment requirements by the deployment timelines.

188. Rogers notes that should ISED retrieve any such Tier 4 licence blocks that it take into account the propagation characteristics of the 600 MHz spectrum. As the Department is aware, 600 MHz spectrum travels great distances. ISED cannot take back a Tier 4 area then licence it to another party if it would result in interference to the original's carriers operations in abutting areas.

189. Rogers thanks the Department for the opportunity to share its views and participate in this process.