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Via email: [ic.spectrumoperations-operationsduspectre.ic@canada.ca](mailto:ic.spectrumoperations-operationsduspectre.ic@canada.ca)

Mr. Eric Parsons  
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Innovation, Science and Economic Development Canada  
235 Queen Street  
Ottawa, Ontario  
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**Re: Canada Gazette Notice No. DGSO-002-18 — Consultation on a New Set of Service Areas for Spectrum Licensing**

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Attached, please find Reply Comments of Rogers Communications Canada Inc. (Rogers) in response to *Canada Gazette*, Part I, December 1, 2018, *Consultation on a New Set of Service Areas for Spectrum Licensing* (DGSO-002-18).

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

Yours very truly,



Howard Slawner  
Vice President – Regulatory Telecom  
HS/pg

Attach.

Consultation on a New Set of  
Service Areas for Spectrum Licensing  
DGSO-002-18

Reply Comments of  
Rogers Communications Canada Inc.  
March 21, 2019



## Executive Summary

- E1. Access to spectrum is critical in order for national network operators to continue delivering advanced connectivity services to Canadians from coast to coast to coast. Creating a new set of smaller service areas may assist small, rural service providers to access additional spectrum; however, it is critical the Department also recognize the importance of geographically-contiguous, interference-free spectrum for national facilities-based networks for current and advanced communication services like 5G, especially for national Internet of Things networks and along transportation corridors. Any future licensing of spectrum on a potential Tier 5 basis should not sacrifice Canadians' ability to connect to robust, nation-wide or other wide-area networks.
- E2. Stakeholders are generally supportive of the creation of Tier 5 service areas, though almost all support modifications to their preferred option in order to reduce interference and administrative complexity. Option 2 remains the better option to serve as the basis on which to design Tier 5 service areas, since it is based on where people live rather than arbitrary municipal or census borders. We continue to view the optimal method of designing Tier 5 service areas as enhancing Option 2 by: amalgamating population centres with a common border into a single service area; defining small population centres as 5,000 to 29,999; amalgamating "other" areas with adjacent population centres; and, adopting Rogers' proposed additional design principles. These enhancements reduce management complexity by creating a rational number of service areas, promote coverage into sparsely populated areas and reduce the risk of interference between service areas while still achieving all of the Department's policy objectives for smaller Tier 5 service areas.
- E3. No convincing arguments are provided that lead Rogers to believe that Tier 5 service areas would be suitable for bands below at least 6 GHz at this time. In fact, our own interference management challenges with operators of legacy equipment in the Tier 4 licensed 3500 MHz band is the only evidence provided on this subject. Improved coordination tools and advancements in technology are required prior to utilizing Tier 5 for frequencies below 6 GHz, and we agree with all the other large and small network operators that recommend that Tier 5 service areas are best suited for millimetre wave bands at this time.

## Introduction

1. Rogers Communications Canada Inc. (Rogers) welcomes the opportunity to reply to comments filed by other parties in response to *DGSO-002-18: Consultation on a New Set of Service Areas for Spectrum Licensing*<sup>1</sup> (the Consultation), published by Innovation, Science and Economic Development Canada's (ISED or the Department) website on February 25, 2019.
2. Rogers stated its position on all of the issues raised in the Consultation in its comments of February 19, 2019. This reply is limited to comments on proposals made by other parties. Failure to address any specific issue raised by other parties should not be taken by the Department as Rogers' acquiescence with the position.

## Rogers' Reply to Comments of Other Parties

Q1A: ISED is seeking comments on the proposed design principles when providing responses, include supporting arguments for or against the proposed principles.

3. After reviewing all the comments submitted by other parties, Rogers continues to be generally supportive of the Department's proposed design principles with the understanding that additional design principles are required to ensure that the creation of Tier 5 service areas properly addresses technical considerations and reflects good spectrum management. In fact, most submissions provide at least general support for the Department's proposed principles.<sup>2</sup>
4. However, Bell, Shaw, and Quebecor recommend the Department not proceed with Tier 5 service areas.<sup>3</sup> Shaw states that Tier 5s, if used, should only apply to fixed spectrum and that Tier 2 or 3 should be used for mobile/flexible use licences, particularly bands under 24 GHz.<sup>4</sup> Bell highlights the challenge of using Tier 5s in low or mid-band spectrum, with CCI Wireless suggesting the use of Tier 5s be

<sup>1</sup> ISED, *DGSO-002-18: Consultation on a New Set of Service Areas for Spectrum Licensing* (Consultation); <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11446.html>.

<sup>2</sup> Bell Comments, para 5; Telus Comments, para 9; RABC Comments, para 11; SaskTel Comments, para 11; Xplornet Comments, para 23; TekSavvy Comments, para 10; CCI Comments, pg 1; CBA, Canwisp, CCSA, ITPA, Cogeco, ECOTEL, Sogetel, and SSI (Joint Submission) Comments, para 22-23; Eastern Ontario Regional Network (EORN) & Eastern Ontario Wardens' Caucus (EOWC) Comments, para 11; Canadian Electricity Association (CEA) Comments, pg 2; Imperial Oil Comments, pg 1; Suncor Comments, pg 1; Syncrude Comments, pg 1; Teck Comments, pg 2; MRC de Temiscouata Comments, para 10.

<sup>3</sup> Shaw Comments, para 17; Quebecor Comments, para 2; Bell Comments, para 2-4.

<sup>4</sup> Shaw Comments, para 7.

restricted to millimetre wave (mmWave) bands.<sup>5</sup> The Saskatchewan Association of Rural Municipalities (SARM) believes higher deployment requirements of Tier 4s is a better option to achieve the Department's goals of rural coverage outside urban centres, something Quebecor highlights is being implemented through higher coverage requirements for bands like 600 MHz and AWS-1.<sup>6</sup>

5. If the Department adopts Rogers' proposed additional design principles and does not implement Tier 5 service areas for bands below at least 6 GHz, then Tier 5s could be of value to Canadian operators and consumers – especially if used only for mmWave bands and above until technology and coordination tools are sufficiently capable of significantly reducing the interference management complexity. Deployment requirements for wide area, national and large regional mobile networks are best set at a Tier 2 or Tier 3 level to ensure operators are able to sustainably meet market demand. Tier 5 deployment requirements should only apply to Tier 5 licences, where the licence is meant to target a very specific population or area.
6. CCI Wireless highlight their support for the Department's proposed principles but state that the third principle of technology and competitive neutrality will conflict with the fourth principle of interference mitigation. In CCI Wireless' view, the challenges of coordinating between IEEE and 3GPP standards in low- and mid-band spectrum will be impossible to overcome with current technology and that T5 service areas should be restricted to mmWave spectrum.<sup>7</sup> As we state in our comments, Rogers has had first hand experience dealing with these types of interference issues in the current Tier 4 3500 MHz band between legacy WiMAX systems and 4G LTE and we have seen numerous cases of interference at distances over 40 km, some as much as 80 km. In fact, we have seen increased interference and coordination issues during the Consultation as companies began testing 5G services, especially in geographically divided Tier 4 service areas. The fundamental cause of this is the fact that legacy technologies cannot synchronize with modern TD-LTE technologies that have very advanced features, such as massive MIMO, nor with 5G ready-radios.
7. Interference mitigation processes, which we have ongoing operational experience with, may potentially involve compromises to the more advanced systems in their capacity, throughput, and coverage. For a couple of network sites, this might not be an issue (except to the consumers served by those sites) but over a large-scale geographic area, this will have negative impacts to spectrum efficiency and Canadians' ability to access the latest connectivity technologies like 5G. Our actual experience with interference and coordination challenges in mid-band spectrum

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<sup>5</sup> Bell Comments, para 12; CCI Wireless, pg. 1.

<sup>6</sup> SARM Comments, pg. 1; Quebecor Comments, para 9.

<sup>7</sup> CCI Wireless Comments, pg 1.

provides more evidence that Tier 5s should only apply to 6 GHz and above, at least for now.

8. For these reasons, the Department should also reject the position by the Eastern Ontario Regional Network and Eastern Ontario Wardens' Caucus (EORN & EOWC) not supporting the use of buffers around urban areas to mitigate interference.<sup>8</sup> Good spectrum management and sound engineering and design principles necessitates sufficient buffers around urban areas even in bands above 6 GHz. Without sufficient buffers, potential interference coordination and mitigation will be both technically and economically unfeasible.
9. The submission from BCBA, CanWISP, CCSA, ITPA, Cogeco, ECOTEL, Sogetel, and SSi (the Joint Submission) proposes several specific adjustments to the Department's design principles.<sup>9</sup> They suggest the Department should consider adding the term "remote" to the first principle, which recognizes the geographic differences of urban and rural areas in Canada. This category is already implicit in the Department's request for input on whether design principles are suitable for "northern and rural areas". As this aligns with the geographic realities of Canada, Rogers would support the addition of "remote". We also support the Department adopting the Joint Submission's proposed text to the fifth design principle, which has the objective of nesting Tier 5 service areas within existing Tier 4 areas. Rogers supports such nesting in principle but believes some variation is acceptable to better serve communities if it conflicts with other design principles, such as if a potential Tier 5 boundary were to divide a population along an existing service area boundary. Flexibility of nesting Tier 5 service areas within multiple Tier 4 service areas is also recommended by TekSavvy.<sup>10</sup> However, the Department should reject the Joint Submission's proposal to alter the wording of the Department's third principle to "maintain technological and competitive neutrality". Technological and competitive neutrality will ensure that facilities-based network operators are all able to effectively compete in the market and bring the benefits of competition to all Canadian consumers.

Q1B: ISED is seeking any suggestions on additional design principles that should be considered.

<sup>8</sup> EORN & EOWC Comments, para 14.

<sup>9</sup> Joint Submission Comments, para 23.

<sup>10</sup> TekSavvy Comments, para 13.

10. In our comments, Rogers proposes several additional design principles, including: geographic separation between population centres; population centres that share a border; population expansion (i.e., sprawl) and contraction; considerations for bodies of water (coastal and inland); and, considerations for terrain. Several stakeholders propose similar physical design principles, including Shaw and the RABC.<sup>11</sup> The Joint Submission states they favour design principles that result in service areas adapted to the reality of their environment and that boundaries should ensure they serve the needs of local communities.<sup>12</sup> These proposals by the Joint Submission also align with Rogers' design principles, which also stress the careful placement of boundaries.
11. Similar to Rogers' policy consideration of geographic contiguity of spectrum, Xplornet highlights the need to foster the deployment of contiguous networks to the greatest degree possible and Bell recommends that Tier 5s do not nest completely inside another Tier 5.<sup>13</sup> Quebecor, when discussing Option 1, also recommends preventing Tier 5s from nesting within another Tier 5 service areas, whether in urban or rural areas.<sup>14</sup> As noted above, Rogers supports the principle of Tier 5 service areas generally nesting within Tier 4 services but this should not be rigidly applied and exceptions should be made when nesting a Tier 5 wholly within a Tier 4 would conflict with other design principle. However, a Tier 5 that is completely nested within another Tier 5 could create a situation where a population is bisected and wireless network operators may end up with non-contiguous network deployment within their own licence areas. Therefore, any such service area should be amalgamated into the surrounding Tier 5 service area. This will help prevent holes in network coverage, especially in the large national networks that already provide service to 99% of Canadians and for any wireless operator deploying networks along major transportation corridors.
12. Members of the resource extraction industry suggest that the Department use Mine Surface Lease boundaries in the design of Tier 5, such that a single Tier 5 should cover a single mine area.<sup>15</sup> The Department should reject these proposals as they have the potential to create an unmanageable number of services areas. As Telus argues, "the concept of service areas only makes sense down to a certain minimum geographic size, after which site based licensing or licensed exempt spectrum is more appropriate."<sup>16</sup> A single mine site would be best served by a network operator

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<sup>11</sup> Shaw Comments, para 20; RABC Comments, para 20 & 25.

<sup>12</sup> Joint Submission Comments, para 25 & 37.

<sup>13</sup> Xplornet Comments, para 29; Bell Comments, para 28.

<sup>14</sup> Quebecor Comments, para 21.

<sup>15</sup> Imperial Oil Comments, pg 2; Suncor Comments, pg 1; Teck Comments, pg 2.

<sup>16</sup> Telus Comments, para 20.

where coverage already exists or can be easily extended, or through a commercially-negotiated subordinate licence covering the site on a grid cell level. To grant a licence to an entire Tier 5 area risks potential interference in adjacent service areas that could disrupt coverage along highways or major routes.

13. Further, the Department should reject all requests for mandatory subordination, such as made by the Joint Submission,<sup>17</sup> which would force subordination agreements upon licensees that acquire exclusive usage spectrum licences at significant and ongoing costs. Licensees also expend considerable resources in network planning and deployments wherever it is economically feasible and market-demand exists, and any mandatory process could result in challenges to the Department's current policy of setting deployment targets for spectrum licences. If a spectrum licence was involuntarily sub-divided, it could result in interference and serve as an impediment to the future deployment plans of the primary licence holder, including other spectrum sharing arrangements.
14. There is also no evidence for the need for mandatory subordination. As Rogers has previously discussed, we have received many requests over the years and agreed to provide spectrum in almost every case. Bell highlights 42% of all subordination agreements approved by the Department since January 2015, "have involved a national or regional carrier subordinating spectrum to a small (i.e., non-national, non-regional) carrier."<sup>18</sup> In fact, the most recent subordinate licence published by the Department involves spectrum provided by Rogers to a small, northern operator.<sup>19</sup> As long as Rogers is not using, or plans to use, the spectrum, we make it available. This has helped foster network deployments in rural and remote parts of the country, including indigenous communities. Subordination and other spectrum sharing agreements should therefore continue to be negotiated on a voluntary, commercial basis to ensure that the primary licensees' deployed wireless networks and future deployment plans are not negatively impacted to the detriment of current and future wireless subscribers.
15. Bell states that, in the event that the Department moves forward with Tier 5s, only a limited portion of the band should be allocated on such a level and that the portion does not require the use of set-asides and can be implemented within existing auction structures.<sup>20</sup> Shaw makes a similar proposal, stating that if there are exceptional circumstances which necessitate the use of Tier 5s for mobile spectrum,

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<sup>17</sup> Joint Submission Comments, para 160.

<sup>18</sup> Bell Comments, para 16.

<sup>19</sup> ISED, *Decisions on Licence Transfers of Commercial Mobile Spectrum*, 17 March 2019; available from: <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10717.html>.

<sup>20</sup> Bell Comments, para 25.

only a single (paired/unpaired) block should be licensed using such a service level.<sup>21</sup> We believe such options may make sense, especially for bands between 6 GHz and mmWave, but those policy decisions are best suited to be determined in consultations for particular bands.

16. The Department should also strongly reject the proposal by the Canadian Electrical Association (CEA) to apply Conditions of Licence that require deployment requirements be met within 2 years and mandatory subscription-based permanent roaming.<sup>22</sup> Such unreasonably short deployment times would completely destroy the incentives for investing in national or regional networks due to the massive uncertainty created, resulting in large amounts of spectrum remaining undeployed across the country. The proposal for a mandatory subscription-based permanent roaming, as we highlight in our comments, would provide unscrupulous actors with a newfound opportunity to engage in unauthorized resale, and thus should also be rejected.

Q2A: ISED is seeking comments on the suitability of Option 1 in addressing the proposed design principles.

17. Numerous stakeholders echo Rogers' position of not supporting Option 1, as it is difficult to administer and manage interference. Xplornet does not believe that Option 1 is a suitable basis for creating Tier 5 service areas, stating how census subdivisions (CSD) were defined does not align with the design principles of Tier 5s.<sup>23</sup> Telus states that CSDs are too small to merit defining each CSD as a unique service area, with Quebecor strongly opposing Option 1 as it could potentially create up to 5,162 Tier 5 service areas.<sup>24</sup> Shaw is of the view that CSDs do not fulfill any of the design principles proposed by the Department and thus does not provide an optimal starting point for the design of Tier 5 boundaries.<sup>25</sup> Finally, the Joint Submission believes Option 1 does not adequately distinguish between urban and rural areas and does not reflect how local conditions may affect network design, with CSDs ranging from impractically small to unacceptably large.<sup>26</sup>

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<sup>21</sup> Shaw Comments, para 7.

<sup>22</sup> CEA Comments, pg 2-3

<sup>23</sup> Xplornet Comments, para 32.

<sup>24</sup> Telus Comments, para 21; Quebecor Comments, para 18-19.

<sup>25</sup> Shaw Comments, para 29.

<sup>26</sup> Joint Submission Comments, para 61.

18. Some stakeholders that are primarily focused on rural operations support the use of Option 1, as they suggest it may provide rural wireless service providers with the ability to acquire spectrum in smaller targeted areas, especially through creation of service areas with little or no coverage that align with municipal boundaries.<sup>27</sup> However, some stakeholders that prefer Option 1 as a basis for creating Tier 5s also suggest significant modifications. For instance, while Bell has a preference for Option 1, they also believe that CSDs will create an excessive number of Tier 5 service areas. As such, Bell recommends using census divisions (CD) to create 293 Tier 5 service areas; if CDs are not used, they recommend amalgamating CSDs to create between 300-500 Tier 5 service areas.<sup>28</sup> Both Imperial Oil and Suncor also prefer Option 1 but with the recommendation that large urban CSDs are combined in order to minimize interference.<sup>29</sup>
19. Should the Department ultimately adopt Option 1 as the basis for determining Tier 5 service areas, we are still of the view that our proposed principles should be incorporated to improve the design of Tier 5 service areas and reduce potential interference risks. As such, we would support any modification that reduces the number of potential Tier 5 service areas to a reasonable number and prevents interference risks to population centres of any size.

Q2B: ISED is seeking comments on whether adjacent urban CSDs should be combined into a single service area.

20. The majority of submissions agree with Rogers' support of combining adjacent urban CSDs into a single service area. This position is shared by all stakeholders that prefer Option 2, including Xplornet, Telus, Quebecor, and Shaw.<sup>30</sup> Most supporters of Option 1 also generally support combining adjacent urban CSDs into a single Tier 5 service area, including Bell, SaskTel, MRC de Temiscouata, Imperial Oil, Suncor, and the Toronto Police Service.<sup>31</sup>
21. Only three submissions explicitly do not support amalgamating adjacent urban CSDs and the Department should strongly disregard this advice. TekSavvy argues this

<sup>27</sup> SaskTel Comments para 19; CCI Wireless Comments, pg 2; MRC de Temiscouata Comments, para 15; CEA Comments, pg 3; Teck Comments, pg 3; EORN & EOWC Comments, para 16.

<sup>28</sup> Bell Comments, para 33-39.

<sup>29</sup> Imperial Oil Comments, pg 2; Suncor Comments, pg 2.

<sup>30</sup> Xplornet Comments, para 37; Telus Comments, para 29; Quebecor Comments, para 20; Shaw Comments, para 30.

<sup>31</sup> Bell Comments, para 40; SaskTel Comments, para 26; MRC de Temiscouata Comments, para 18; Imperial Oil Comments, pg 2; Suncor Comments, pg 2; Toronto Police Service Comments, pg 7.

would result in an urban service area unaffordable to smaller entities.<sup>32</sup> Their suggestion that having 10-12 service areas for the urban centre of Toronto would be a feasible option may be a result of their inexperience with wireless network building and interference management. CCI Wireless also opposes amalgamation for similar reasons and believes it is unnecessary if T5s are only used for spectrum with appropriate propagation characteristics.<sup>33</sup> However, even when dealing with only mmWave propagation as suggested by CCI Wireless, coordinating 10-12 licence areas in a single urban core would still be unfeasible.

22. The Joint Submission also opposes combining adjacent Tier 5 service areas, instead suggesting operators can simply acquire the adjacent licence.<sup>34</sup> The Joint Submission does not account for the additional risk to network planning nor the additional administrative burden on both the Department and national and large regional operators that managing so many service areas would entail. Further, it is inconsistent with the Joint Submission's own position recommending that the Department should alter other design principles in order to have a single Tier 5 service area for a population centre that is currently bisected by a Tier 4 boundary. If the Joint Submission positions were consistent, they would simply acquire the neighbouring Tier 5 licence.

23. For clarity, Rogers supports the Department not having an overly strict policy of having Tier 5s completely nest within only a single Tier 4 service area and that ISED should always amalgamate single population centres of all sizes. We continue to view the creation of a service area that contains only most or part of a population centre as creating the potential for substantial interference issues between these adjacent service areas with no apparent benefit.

Q2C: ISED is seeking comments on whether there should be a minimum or maximum size for the service areas and if very small CSDs should be amalgamated into the larger surrounding or adjacent CSD.

24. There is broad support for limits to the sizes of service areas. Several stakeholders echo the Rogers position of general support for a minimum size for smaller service areas, including Telus, Quebecor and Shaw.<sup>35</sup> In addition, several parties provide more specific recommendations for minimum sizes. SaskTel and EORN & EOWC

<sup>32</sup> TekSavvy Comments, para 31.

<sup>33</sup> CCI Wireless Comments, pg 2.

<sup>34</sup> Joint Submission Comments, para 57.

<sup>35</sup> Telus Comments, para 63; Quebecor Comments, para 25; Shaw Comments, para 31.

recommend Tier 5 service areas amalgamate rural CSDs less than two square kilometres while MRC de Temiscouata suggests the minimum should be five square kilometres.<sup>36</sup> However, creating such small service areas would result in a high risk of interference between service areas, as well as massively increasing the total number of Tier 5s for the Department to administer and for network operators to coordinate.

25. Conversely, MRC de Temiscouata suggests the maximum size of Tier 5 service areas should be 2016 CSDs in Southern Canada but 1,000 square kilometres in Northern Canada, with the CEA recommending that the maximum size as 50,000 NTS grid units for northern CSDs.<sup>37</sup> As highlighted above and in our comments, should the Department decide to move forward with the suboptimal Option 1 to design Tier 5 service areas, it should amalgamate CSDs in order to respect its design principles and achieve approximately 360 Tier 5 service areas. Such a number would meet the Department's policy objectives for smaller service areas while significantly reducing potential interference and administration management complexity.
26. Bell recommends that the Department not use geographic size to reduce the number of Tier 5 service areas but instead use population size and proposes a 4-step process to amalgamate CSDs, which would create approximately 500 service areas.<sup>38</sup> Xplornet is of the view that there should be no minimum or maximum size to Tier 5 service areas but that population centres should be licensed as a single licence area, and separated from low-population-density areas.<sup>39</sup>
27. Option 2 is the optimal option to design Tier 5 service areas, since it is based on where people live rather than arbitrary municipal or census borders. However, should the Department elect to use Option 1 as the basis for service area design, we strongly recommend that the Department amalgamate CSDs, potentially using a process similar to Bell's 4-step process. Although 500 Tier 5 service areas is still very high, approximately three times the number of Tier 4 service areas, we support, in principle, all efforts to reduce interference and administration management complexity through an appropriate number of well designed service areas.

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<sup>36</sup> SaskTel Comments, para 29; EORN & EOWC Comments, para 23; MRC de Temiscouata Comments, para 21.

<sup>37</sup> MRC de Temiscouata Comments, para 22; CEA Comments, pg 3.

<sup>38</sup> Bell Comments, para 41-43.

<sup>39</sup> Xplornet Comments, para 37-38.

Q2D: ISED is seeking comments to gauge if this option is suitable for northern and rural areas.

28. Upon review of the comments of other participants, we still believe Option 1 is not ideal to maximize coverage in rural and northern areas, which may be constricted by small service areas. This view is also shared by Xplornet, who believes Option 1 does not properly consider important differences of urban and rural geographies.<sup>40</sup>
29. Those in support of Option 1 have mixed views on its utility for northern and rural areas. MRC de Temiscouata sees Options 1 as suitable for rural areas though not for northern ones and SaskTel believes it is not viable in remote northern and rural areas.<sup>41</sup> The Joint Submission also recommends remote areas should be considered separately from rural areas under Option 1.<sup>42</sup> Bell, Telus, and the CEA all view the option as viable in northern and rural areas, as long as their proposed adjustments are incorporated while extractive industries are supportive as long as service area boundaries match up to their operations.<sup>43</sup> However, no substantial evidence is provided that overcomes the deficiencies that make Option 1 suboptimal in achieving the Department's goals for Tier 5 services areas.

Q3A: ISED is seeking comments on the suitability of Option 2 in addressing the proposed design principles.

30. Option 2 is the preferred choice of the Department's proposals for a range of national, large regional, and rural wireless network operators, as well as a rural association.<sup>44</sup> As Quebecor states, "La deuxième option nous apparaît plus acceptable que la première, puisqu'elle n'entraînerait pas une hyperfragmentation géographique des zones de service."<sup>45</sup> Selecting Option 2 and enhancing it by adopting Rogers' proposed additional design principles continues to be the optimal policy choice to improve the design and creation of Tier 5 service areas in order to reduce the interference risk and management complexity that such small service areas can generate.

<sup>40</sup> Xplornet Comments, para 39.

<sup>41</sup> MRC de Temiscouata Comments, para 24; SaskTel Comments, para 32.

<sup>42</sup> Joint Submission Comments, para 62.

<sup>43</sup> Bell Comments, para 44; Telus Comments, para 33; CEA Comments, pg 3; Imperial Oil Comments, pg 2; Teck Comments, pg 3.

<sup>44</sup> Telus Comments, para 34; Shaw Comments, 35; Xplornet Comments, para 40; SARM Comments, pg 1.

<sup>45</sup> Quebecor Comments, para 28.

31. Some parties do not support Option 2, with CCI Wireless declaring it “unnecessarily complex” while MRC de Temiscouata states that it “simplifie les considérations de gestion” even if they do not endorse it.<sup>46</sup> Utilities and extractive industry stakeholders, along with SaskTel and the Joint Submission, suggest Option 2 may create too many sparsely-populated areas aggregated into a single Tier 5 service area within Tier 4s, with Syncrude simply and explicitly stating it is “not suitable” for their operations.<sup>47</sup> As has been mentioned above, extractive resource industries are likely best served by a network operator or through a commercially-negotiated subordinate licence covering the site on a grid cell level. Further, ISED has proposed that Tier 5 service areas have a material population centre to incent deployment of the service area. As Option 2 was developed to provide a clear delineation between highly populated urban areas and very rural areas, it provides the benefit of creating service areas based on where people live rather than arbitrary municipal or census borders.
32. Bell’s primary objection to the use of Option 2, other than their general preference for Option 1, appears to be the concern that Tier 5s could be wholly nested within other Tier 5 service areas.<sup>48</sup> They also have concerns with Tier 5s in multiple Tier 4 service areas. However, the Department should amalgamate any Tier 5 service area that is wholly nested within another Tier 5, which will prevent potential gaps in coverage and interference management. The Department should also not be overly rigid in the nesting of Tier 5 service areas within a single Tier 4 service area when other design principles should take precedent, such as not placing a service area boundary through a population centre.

Q3B: ISED is seeking comments on the proposed minimum population for small population centre service areas. A rationale should be provided if a different population is proposed.

33. Upon reviewing all comments submitted in the Consultation, we continue to recommend the Department remove the smallest population centres to reduce the overall number of service areas and simplify management, increasing the lower bound of small population centres to 5,000. This would make the total number of Tier 5 services areas approximately 360 (30 large, 58 medium, and 272 small),

<sup>46</sup> CCI Wireless Comments, pg 3; MRC de Temiscouata Comments, para 26.

<sup>47</sup> CEA Comments, pg 4; Imperial Oil Comments, pg 3; Suncor Comments, pg 2; Teck Comments, pg 4; SaskTel Comments, para 34; Joint Submission, para 72-73; Syncrude Comments pg 2.

<sup>48</sup> Bell Comments, para 45.

which would meet the Department's policy objectives for smaller service areas while significantly reducing the interference and administration management complexity.

34. Telus states, "the minimum size of service area should be one that supports the deployment of a cluster of base sites which is the fundamental purpose of area based licensing", yet suggests a population of 2,000 may be large enough to support such deployments.<sup>49</sup> SaskTel supports increasing the minimum population size but also believes 2,000 for small population centres would be sufficient, whereas MRC de Temiscouata recommends the minimum population be just 100.<sup>50</sup> Clearly, service areas based on a population of as low as 100 would create enormous administrative challenges for the Department and national and large regional network operators, as well as significant coordination challenges. However, the 800+ service areas created by the Department's original lower bound proposal of 2,000 would also increase coordination and administrative challenges.
35. TekSavvy recommends that the minimum population for small population centres be raised to 10,000 to remove the administrative complexity but that large urban population centres should be subdivided into smaller service areas.<sup>51</sup> The Department should reject such a proposal as perhaps being too large a minimum to meet the policy goals of creating Tier 5 service areas while creating insurmountable interference in urban centres, the worst of both worlds. All population centres should generally be a single Tier 5 service area, regardless of their size.
36. Xplornet suggests modifying Option 2 to isolate large and medium population centres and have all areas in an existing Tier 4 service area that are not part of those population centres be licensed as a single "other" area.<sup>52</sup> While Xplornet's proposal has the potential to substantially simplify management and prevent potential interference, the creation of a single "other" service area in current Tier 4s could prevent coverage of large, medium and small population centres being extended into outlying suburbs and rural areas.

Q3C: ISED is seeking comments on whether the "other" service areas (remainder areas in each Tier 4) should be licensed differently (e.g. on a shared or first-come, first-served basis).

<sup>49</sup> Telus Comments, para 41.

<sup>50</sup> SaskTel Comments, para 37; MRC de Temiscouata Comments, para 28.

<sup>51</sup> TekSavvy Comments, para 40.

<sup>52</sup> Xplornet Comments, para 47.

37. Stakeholders are split on how best to license “other” service areas. Bell recommends there be no unique licensing process, highlighting that many operators may require access to “other” service areas for coverage contiguity, especially along transportation corridors.<sup>53</sup> Shaw and Xplornet also support that all licence areas should be licensed on the same basis as other Tier 5 service areas, with Telus stating that this is a decision best made when developing the policy framework for individual bands.<sup>54</sup>
38. SaskTel supports a first-come first-served (FCFS) basis using within Tier 5 “other” areas on a grid cell level, while CCI Wireless recommends the FCFS licences come with a one-year deployment requirement.<sup>55</sup> Quebecor has no objections to “other” areas being licensed on FCFS so long as auctioned licences are protected from interference from FCFS licensees while SARM believes licensees in “other” areas should be privileged with different deployment requirements and additional subsidies.<sup>56</sup>
39. Upon review of the Consultation submissions, Rogers believes the Department’s best policy is to continue the use of open auctions to license mobile spectrum to ensure those companies that value the spectrum the most will be able to acquire it and put the spectrum to its highest use. Open auctions also makes certain that network operators pay the true market value of this scarce and valuable resource to the benefit of Canadian taxpayers. If spectrum remains unawarded through an open auction process, then alternative licensing could be explored, a recommendation supported by the Joint Submission.<sup>57</sup>
40. Some resource extraction stakeholders are the only group to express support for spectrum sharing.<sup>58</sup> However, opportunistic sharing technology is still years away from any commercial deployments and has substantial technical, regulatory, and business challenges to overcome before it can become a reality. As noted above, a single mine site would be best served by an extension of a commercial network or through a commercially-negotiated subordinate licence covering the site.

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<sup>53</sup> Bell Comments, para 48

<sup>54</sup> Shaw Comments, para 37; Xplornet Comments, para 48; Telus comments, para 42.

<sup>55</sup> SaskTel Comments, para 55; CCI Wireless Comments, pg 4.

<sup>56</sup> Quebecor Comments, para 30-31; SARM Comments, pg 2.

<sup>57</sup> Joint Submission Comments, para 165.

<sup>58</sup> Imperial Oil Comments, pg 3; Suncor Comments, pg 3.

Q3D: ISED is seeking comments on whether this option is suitable for northern or rural areas.

41. Supporters of Option 1 suggest that that option is better suited for northern or rural areas, including stakeholders in the resource extraction industry like Suncor who state, “Option 2 is not materially different from Tier 4 in northern and rural areas and will not help Suncor achieve what is needed.”<sup>59</sup> Telus suggests Option 2 is well suited for northern areas though is less certain in rural areas, while MRC de Temiscouata finds it is a suitable option provided that the minimum population size is lowered to 100.<sup>60</sup> These recommendations are not persuasive, as service areas for only 100 persons in far rural locations or resource extraction sites are best served by site-based licensing, licence-exempt spectrum or commercially-negotiated subordinate licences. To do otherwise creates risks of potential interference, enormous administrative complexity, or potential for gaps in coverage for national or large regional networks.
42. Bell, who is a proponent of Option 1, states that “there is no reason to believe that Option 2 could not be applied to northern areas.”<sup>61</sup> Xplornet recommends that, with modifications, Option 2 as suitable for rural Canada.<sup>62</sup> Rogers shares this view, that with adjustments (such as those proposed by Rogers) to prevent overly small service areas in northern or rural areas, wireless coverage can be maximized in these communities to benefit all Canadians.

Q3E: ISED is seeking comments on whether population centres, which have adjacent boundaries, should be amalgamated to form a single service area.

43. Nearly all submissions recommend that population centres with adjacent boundaries be amalgamated to form a single service area, including supporters of Option 1 like SaskTel and MRC de Temiscouata, supporters of Option 2 like Quebecor, Xplornet, and Rogers, and those preferring their own alternatives like Telus and Shaw.<sup>63</sup> Amalgamation would respect the Department’s guiding principles of defining area

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<sup>59</sup> SaskTel Comments, para 39; CCI Wireless Comments, pg 3; Imperial Oil Comments, pg 3; Teck Comments, pg 4; Suncor Comments, pg 3.

<sup>60</sup> Telus Comments, para 44; MRC de Temiscouata Comments, para 36.

<sup>61</sup> Bell Comments, para 49.

<sup>62</sup> Xplornet Comments, para 49.

<sup>63</sup> SaskTel Comments, para 40; MRC de Temiscouata Comments, para 38; Quebecor Comments, para 33; Xplornet Comments, para 50; Rogers Comments, para 76; Telus Comments, para 46; Shaw Comments, para 39.

boundaries in low population areas, as well as prevent the creation of service areas that contain only part of a population centre with substantial potential interference issues for no material benefit.

44. Only CCI Wireless lodges an objection to amalgamation under Option 2, suggesting that it would create irregular shapes and challenging deployment while also increasing licence costs.<sup>64</sup> The Department should reject this recommendation, as splitting a population centre is what would create challenging deployment through increased interference mitigation, which would also cost significantly more to remediate. Amalgamation of population centres, which have adjacent boundaries, into a single service area is the best way to achieve the Consultation's goals.

Q4: ISED invites interested parties to submit alternative proposals for smaller service areas. All alternative service area proposals must be applicable to all of Canada and promote the federal government's policy objectives.

45. Upon review of the alternative proposals in other submissions, we continue to view the Department's Option 2 with the Rogers proposed enhancements as the best option to achieve ISED's policy objectives. These additional principles include: geographic separation between population centres; population centres that share a border; population expansion (i.e., sprawl) and contraction; considerations for bodies of water (coastal and inland); and, considerations for terrain. Option 2 is the optimal starting point for designing Tier 5 service areas, as it is based on where people live rather than arbitrary municipal or census borders.
46. Bell offers two alternative proposals, as noted above. The first is to use Census Divisions to create 293 Tier 5 service areas, which is a much more reasonable number in terms of administrative and interference complexity.<sup>65</sup> The second option Bell proposes is a 4-step process to improve Option 1's use of Census Subdivisions. The first three steps Bell proposes (ensuring no Tier 5 contained within another Tier 5; amalgamating CSDs to replicate the area of a large population centre; amalgamating contiguous CSDs with less than a population of 30,000) are improvements to Option 1 and would create approximately 500 Tier 5 service areas. This would also create service areas with similar population sizes to U.S. county-based licensing. While 500 service areas is still very high for administrative purposes, it may make interference management feasible in mmWave bands. However, no matter which option the Department elects to use as its basis for

<sup>64</sup> CCI Wireless Comments, pg 4.

<sup>65</sup> Bell Comments, para 9.

designing service areas, it should not adopt Bell's recommendation to ensure Tier 5s nest within a single Tier 4. While we support this as a general principle, we believe it should not be rigidly applied when it conflicts with other design principles, like ensuring service area boundaries do not bisect population centres.

47. Telus proposes an alternative approach combining elements of Option 1 and Option 2, starting with the use of Statistics Canada Census Consolidated Subdivisions (CCS) instead of CSDs as the basis for defining Tier 5 service area boundaries. Telus also recommends amalgamating all contiguous CCS areas that overlap, partially or completely, with medium and large population centres, in order to create undivided Tier 5 service areas.<sup>66</sup> While Telus' recommendations are an improvement by reducing interference and administrative complexity, it is still suboptimal since it is based on arbitrary borders, not on where people live, and a system not originally intended for spectrum management.
48. TekSavvy also proposes combining various elements from Option 1 and Option 2 to create an alternative "Option 3".<sup>67</sup> While some of the elements have some merit in principle, such as attempting to account for growth and urban sprawl, TekSavvy's proposal to divide urban population centres into multiple service areas would make network coordination and interference management even in mmWave bands technically and economically unfeasible. The Department should reject such proposals, otherwise, Tier 5 service areas could result in degrading service for urban Canadians.
49. Shaw proposes an alternative that would see the Department either create Tier 4 subdivisions on an ad hoc basis for some Tier 4s as part of licensing framework consultations or review all Tier 4s and apply Option 2 only to those individual Tier 4 service areas that may contain areas that have deployment challenges.<sup>68</sup> The Department should reject such an alternative. While there would likely be some benefit derived from reduced administrative and interference complexity from this approach, the benefits of using Tier 5 licences nationally for mmWave bands and above would be lost.
50. The Joint Submission provides a detailed alternative proposal to the Department's options. Their alternative would see the creation of 370 urban, 867 rural, and 61 remote service areas for a total of 1,298 Tier 5 service areas.<sup>69</sup> In the Joint Submission's view, this is reasonable and manageable number as it falls between the 5,162 service areas of Option 1 and 863 Tier 5s of Option 2. They also suggest

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<sup>66</sup> Telus Comments, para 47.

<sup>67</sup> TekSavvy Comments, para 42-43.

<sup>68</sup> Shaw Comments, para 40.

<sup>69</sup> Joint Submission Comments, para 120.

such a number is in line with other jurisdictions. However, even 863 Tier 5 service areas would be overly complex and pose significant interference risks and administrative challenges and 1,298 would increase those already significant risks by a material amount. The Joint Submission's proposal of 1,298 Tier 5 service areas is neither reasonable nor manageable.

51. In contrast, Rogers' proposal is much more in line with the small service area licensing approach used in the U.S., which is based on approximately 3,200 counties.<sup>70</sup> Using a similar scale between Canadian (35M) and U.S. (329M) populations suggests that about 340 county-equivalent service areas should be used for urban and rural areas.<sup>71</sup> Rogers supports consideration for northern communities, with some number of remote service areas added, which creates a number much closer to our proposed 360 Tier 5 service areas. Our proposed enhancements to Option 2 as a basis for Tier 5 design is a reasonable, common sense approach that will generate less interference and administrative complexity, and is a much more manageable system, especially for the Department. In addition to having a scale in line with the equivalent U.S. system, it provides full flexibility to operators while meeting the values proposed by the Department (and the Joint Submission's proposal).
52. Of particular concern with the Joint Submission proposal is their recommendation that large urban areas should be divided into multiple service areas with upper limits placed on the population size of Tier 5s.<sup>72</sup> In their view, it is okay for tier boundaries to run through populated areas, provided they are sufficiently large. The Department should strongly reject such proposals, from the Joint Submission or any other similar comment, as all population centres should be amalgamated if adjacent or close. Interference control is a requirement for co-existence and boundaries should never bisect a population centre nor separate sites from communities, both specific concerns expressed by the Joint Submission.<sup>73</sup> Placing service area boundaries within population centres, including large urban areas, would amplify all the interference and management problems expressed by the Joint Submission. In contrast, the Rogers proposal would ensure efficient use of spectrum and avoid a multitude of cross-border interference disputes for the benefit all Canadians.
53. The Joint Submission also proposes that limits should be set based on Tier 5 service areas (square km) regardless of population density, which would result in extremely

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<sup>70</sup> FCC. *FCC Areas*; available from: <https://www.fcc.gov/oet/maps/areas>.

<sup>71</sup> Populations based on ISED 600 MHz Consultation (2016 Pops) and CIA World Factbook (U.S. est. July 2018); available from: <https://www.cia.gov/library/publications/the-world-factbook/geos/us.html>.

<sup>72</sup> Joint Submission Comments, para 57-58.

<sup>73</sup> Joint Submission Comments, para 39-40.

large areas with low population qualifying as individual service areas.<sup>74</sup> While we support that special consideration should be given to remote communities, setting thresholds based on area rather than population is not in the best interest of Canadians. Service areas should be sized appropriately based on population.

54. For all these reasons (complexity of licensing; dividing large urban areas; creating inappropriately sized Tier 5 service areas), the Department should reject the Joint Submission's alternative proposal. The Rogers proposed enhancements to Option 2 will provide a better foundation for the Department to design service areas that will achieve the Consultation's policy goals and be viable for small rural carriers as well as national and large regional network operators, thus, beneficial to all Canadians. Where the Joint Submission makes recommendations aligned with Rogers' design principles (e.g. service areas adapted to the reality of their environment, considering topography, highways, and not separating sites from communities; small population centres being a minimum of 5,000; accounting for population growth; manual adjustments to boundaries if required to prevent bisecting populations, even if there's an impact to nesting within existing Tier 4s; etc.), the Department should consider the benefits these will provide to the design of Tier 5s. However, any proposal or option that will result in more than approximately 500 Tier 5 service areas will introduce so much interference and administration management complexity as to completely overwhelm any potential benefits to Canadians through the creation of a new set of service areas for spectrum licensing.

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

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<sup>74</sup> Joint Submission Comments, para 98.