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March 31, 2026      via email: [spectrumauctions-encheresduspectre@ised-isde.gc.ca](mailto:spectrumauctions-encheresduspectre@ised-isde.gc.ca)

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**Re: Canada Gazette, SPB-002-26: Consultation on the Revisions to the 2500-2690 MHz Band Plan**

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Ms. Davis,

Rogers Communications Canada Inc. (Rogers) is pleased to provide Innovation, Science and Economic Development Canada with the following comments in response to *SPB-002-26: Consultation on the Revisions to the 2500-2690 MHz Band Plan*, published in the Canada Gazette, Part I, February 14, 2026.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Howard Slawner', written in a cursive style.

Howard Slawner  
Vice President - Telecom  
HS/pg

Attach.

Consultation on the Revisions to the  
2500-2690 MHz Band Plan  
SPB-002-26

Comments of  
Rogers Communications Canada Inc.  
March 31, 2026



## Executive Summary

- E1. Rogers supports Innovation, Science and Economic Development Canada's (ISED or the Department) proposals to revise the band plan for the 2500-2690 MHz range. Revising the Canadian Broadband Radio Service band from mixed Frequency Division Duplex (FDD) and Time Division Duplex (TDD) to TDD-only will provide network operators in Canada (and the United States) greater flexibility to deal with the increasingly challenging cross-border coordination. In addition, an all TDD band can maximize the spectral efficiency of the band long-term as operators look to transition from 4th Generation to 5th Generation mobile networks, benefiting Canadian consumers and the broader economy.
- E2. The Department should implement a transition process that is completed in three distinct zones, with deployments for the new band plan starting in 2029 and the actual transition to start in 2033. Facilities-based operators will be required to transition (or consolidate) over 18,000 sites operating across the country using the current Broadband Radio Service band plan. While the rollout of radios that can operate using the revised Canadian band plan will take place over several years, the actual transitions will be carefully orchestrated, large-scale, single night 'cut-overs'. Unlike the deployment of a new spectrum band, like the 600 MHz or 3800 MHz bands, the Broadband Radio Service band is currently, and will continue to be, heavily used by both mobile and fixed wireless Internet Canadian consumers. Ongoing Canadian wireless usage thus supports having the actual transition date sufficiently in the future in order to have zero effective downtime for the band.
- E3. As an outgrowth of the industry-wide cross-border coexistence working group, preliminary discussions have occurred between Canadian licensees. Rogers recommends the transition to a revised band plan should be structured as follows.
- **Zone 1** – Ontario/Québec with the Atlantic portion of Gaspé peninsula excluded; cut-over transition date: **May 2033**
  - **Zone 2** – British Columbia, Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, plus the Atlantic portion of the Gaspé peninsula of Québec; cut-over transition date: **May 2035**
  - **Zone 3** – Nunavut, Northwest Territories and Yukon; cut-over transition date: **May 2036**
- E4. This band revision and transition plan must be accompanied by the re-assignment of Broadband Radio Service holdings to create contiguous spectrum holdings for licensees, particularly in urban areas, to justify the investments by Canadian

facilities-based operators to transition to the revised band plan. Contiguous holdings will create significant spectral and operational efficiencies, particularly as operators can transition legacy 4th Generation radios to more advanced 5th Generation systems that can support bandwidths of 100 MHz.

- E5. The Department should also allow for relaxation of deployment requirements (enforcement) both prior to and for five years following the transition to the new band plan. While operators should be required to fully meet their deployment requirements, some flexibility in timing may be required to facilitate the transition. Canadians will benefit more from an orderly transition to the new band plan than strict enforcement of deployment requirement using a band plan that will be sunsetted in a few years.
- E6. The transition to a TDD-only band also provides the Department with the opportunity to license the currently restricted intra-band guard band holdings through a competitive auction process. The Department created two 5 MHz restricted bands, 2570-2575 MHz and 2615-2620 MHz, to mitigate the interference inherent with the current Canadian band plan, between systems operating in the paired (FDD) and unpaired (TDD) spectrum. This restricted spectrum is effectively sterilized in Canada, as currently deployed Canadian TDD equipment cannot typically operate within the restricted frequency ranges owing to more stringent filtering to protect the FDD deployments. We thus recommend the Department also include any assigned guard band to make a 10 MHz TDD block available for auction at the Tier 3 licence area across the country.
- E7. As part of the licensing of restricted TDD spectrum, the Department should adopt a similar assignment round structure to the 3500 MHz band, where all existing and transition 2500 MHz band holdings would be put into the auction assignment round. A licensee's holdings would be made contiguous by default (including any transition and auction holdings). This will allow licensees to express a preference for specific frequency ranges, while those who do not wish to bid can still be accommodated in the new band plan with fully contiguous holdings.
- E8. We note that targeting a transition date of 2033 will allow sufficient time for the Department to consult on a licensing policy and run a successful auction, with enough time for operators to coordinate final spectrum frequency assignments under the new band plan. By making additional mid-band spectrum available for facilities-based operators while making all current and future holdings fully contiguous within the revised band plan, the Department will successfully maximize the economic and social benefits that Canadians derive from the use of radio frequency spectrum.

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## 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 *SPB-002-26: Consultation on the Revisions to the 2500-2690 MHz Band Plan*<sup>1</sup> (the Consultation), published in the *Canada Gazette*, Part I, February 14, 2026.
2. As Canada's largest single national network operator, including with the greatest number of total sites deployed in the Broadband Radio Service (BRS) band, Rogers is supportive of the Consultation's proposals to revise the band plan for the 2500-2690 MHz range (referred to as the 2500 MHz band). Revising the Canadian 2500 MHz band from mixed Frequency Division Duplex (FDD) and Time Division Duplex (TDD) to TDD-only will provide Canadian and United States (U.S.) network operators greater flexibility to deal with the increasingly challenging cross-border coordination and coexistence issues. In addition, an all TDD band can also maximize the spectral efficiency of the band long-term as operators transition from 4th Generation (4G) Long Term Evolution (LTE) to 5th Generation (5G) New Radio (NR) network systems. The Department should adopt a transition process that is completed in three stages/zones, with deployments starting in 2029 and the actual transitions to start in 2033. The proposed band plan revision and transition must be accompanied by the re-assignment to create contiguous spectrum holdings for licensees, particularly in urban areas, to justify the significant investments by Canadian facilities-based operators. The Department should allow for relaxation of deployment requirements both prior to and for five years following the transition to the new band plan. While operators should be required to fully meet their deployment requirements, some flexibility may be required to facilitate a successful transition and is in the best long-term interests of Canadian wireless consumers.
3. In addition, the transition to a TDD-only band will allow the Department the opportunity to license the currently unassigned restricted guard band holdings through a competitive auction process. We recommend the Department also include any assigned guard band spectrum to make a 10 MHz TDD block available for auction at the Tier 3 licence area across the country. The Department should also adopt a similar assignment round structure to the 3500 MHz band, where all existing and transition 2500 MHz band holdings would be put into the assignment round. A licensee's holdings would be made contiguous by default (including any transition and auction holdings). This will allow licensees to express a preference

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<sup>1</sup> ISED, *SPB-002-26: Consultation on the Revisions to the 2500-2690 MHz Band Plan* (Consultation); <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/consultations/consultation-revisions-2500-2690-mhz-band-plan>.

for specific frequency ranges, while those who do not wish to bid can still be accommodated in the new band plan with fully contiguous holdings. Such a policy outcome would support the Department in achieving the objectives of the *Spectrum Policy Framework for Canada*, “to maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum resource”.<sup>2</sup>

4. The overall strength and resilience of Canada’s wireless (and wireline) facilities-based networks following the COVID-19 pandemic has been a point of pride for Canada. Although some Canadians living in rural and remote areas do not always have the same connectivity options (which governments and industry are working together to resolve), broadly speaking, Canadians currently have access to world-class mobile voice and broadband data services due to facilities-based competition between the national operators. According to the Canadian Radio-television and Telecommunications Commission (CRTC), telecommunications investment made in both wireless and wireline networks was \$12.73 billion in 2024 for plant and equipment (\$3.6 billion for wireless alone), a combined capital intensity of 22.8% due to the requirement to maintain and upgrade extensive network infrastructure.<sup>3</sup> In 2024, Rogers invested more than \$3.5 billion in our networks, including \$1.6 billion alone in our wireless networks.<sup>4</sup>
5. Facilities-based leaders like Rogers continue to make the significant investments required to maintain and grow network infrastructure that enables Canadians to fully participate in the digital economy and take advantage of innovative new services. These contributions to the economy – in both investment and employment – will be crucially important as Canada looks to continue navigating the current global economic uncertainty, as next-generation networks and services are crucial to maintaining international competitiveness. However, in order to continue meeting evolving digital demands, Canadian spectrum policy must ensure that spectrum can be effectively deployed within facilities-based mobile networks. As the Department itself highlights, “maximizing the use and efficiency of currently available spectrum will support the continued development and deployment of 5G technologies, and prepare Canada for the sixth generation (6G) of wireless technology anticipated in a few years.”<sup>5</sup>

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<sup>2</sup> ISED Consultation, para 5.

<sup>3</sup> CRTC, *Communications Market Reports - Open Data: Data - Telecommunications sector*; <https://web.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/cmrd.htm>.

<sup>4</sup> Rogers, *Canada’s communications & entertainment company. 2024 Annual Report*, pg 47; <https://about.rogers.com/wp-content/uploads/Rogers-2024-Annual-Report-1.pdf>.

<sup>5</sup> ISED Consultation, para 4.

## **Brief History of Cross-border Coexistence of BRS 2500 MHz**

6. As the Department is aware, and as has been documented by Canadian flexible-use spectrum licensees in previous consultations, there have been ongoing cross-border coordination challenges between licensees in the Canadian 2500 MHz BRS band and the U.S. 2500 MHz BRS / Educational Broadband Service (EBS) band for a number of years. This is the result of the Canadian 2500 MHz band plan being a mix of FDD and TDD frequency ranges, while the U.S. band plan is all TDD, which requires geographic or frequency separation to coexist.
7. Impacted licensees on both sides of the border have been engaged in on-going, good-faith and productive efforts to minimize interference and maximize spectrum usage. Although the problem is most acute in areas of population centres located in close proximity to the border, the situation can impact areas further from the geographic border when exacerbated by large bodies of water or as a result of network solutions near land borders creating 'knock-on' effects far from the local interference.
8. As background, starting in about 2014, Canadian network operators began noticing harmful interference to their BRS 2500 MHz paired operations along international border areas, most notably in the Windsor and Sarnia areas of Ontario, as well as in the Niagara region. During discussions with the U.S.-based carrier Sprint, it was found that unpaired (TDD) to paired (FDD) interference between tall towers was occurring at distances up to 120 km (total distance, tower-to-tower). Both ISED and the Federal Communications Commission (FCC) supported their domestic operators, however, coordination discussions were largely left to private operators in order to optimize and maximize spectral efficiency and service delivery on both sides of the border. Although the U.S. operator took measures to restrict their spectrum utilization to just the middle 50 MHz from 2570-2620 MHz in immediate border areas, additional distance and antenna optimization was required to manage the interference in both directions.
9. In 2018, after the merger of U.S. operators Sprint and T-Mobile, discussions resumed between Canadian and U.S. operators to address the need for U.S. bandwidth expansion beyond the 50 MHz mid-band. Focusing primarily on the Detroit market, Canadian operators understood the pressing need for additional U.S. usage within the band and subsequently agreed to manage harmful interference that would impact the Canadian BRS 2500 MHz FDD uplink within the border zone from Lake Erie and Lake Huron.
10. In 2022, Canadian operators were again approached by T-Mobile to address the growing need for bandwidth expansion in additional large U.S. border markets



such as Buffalo. Further, T-Mobile was seeking a country-wide solution to manage interference in less populated areas. Canadian operators agreed to discussions, forming a coalition representing five licensees. From the outset, operators in both countries agreed to the common objective of maximizing spectrum preservation in large population centres to benefit the greater good of both Canadian and U.S. wireless consumers. In 2024, the Vermont Telephone Company was added to the U.S. coalition.

11. After significant efforts by Canadian and U.S. network operators, negotiations concluded with the signing of an agreement between the parties by the end of 2024. Notwithstanding the ongoing coexistence challenges between the U.S. and Canadian band plans, the agreement would maximize spectrum usage on both sides of the border.
12. Although Canadian licensees have maintained interference-free operations in large population centres, including Toronto, Montreal, Vancouver, and Ottawa, concessions were necessary in smaller markets such as Windsor/Sarnia, Victoria, Niagara, Kingston-St Lawrence, and Southern Québec in order to protect large U.S. population centres. The consequence of these concessions is that valuable 2500 MHz spectrum previously serving Canadians in these border areas has become unusable, thereby impacting availability and system performance. It must also be acknowledged that U.S. operators have also made reciprocal concessions in their smaller markets to protect large Canadian markets.
13. By harmonizing the Canadian band plan with the U.S. band plan, cross-border coexistence can be achieved in all areas currently impaired by harmful interference today. Restoring BRS 2500 MHz spectrum availability for Canadians in these border areas will thus enhance the service that operators can provide while increasing the efficient use of the spectrum.

### **Costs and Benefits to Revising Band Plan**

14. As discussed in detail below in response to Q1, Rogers supports the Consultation proposals to revise the BRS band plan to an unpaired band plan in 2500-2690 MHz. There are several important reasons for adopting this transition, including cross-border coexistence, equipment benefits (both infrastructure and handsets), and spectral efficiency gains from defragmentation. Through careful and coordinated planning, Canadian network operators can successfully manage the proposed migration for the benefit of Canadian mobile customers, but only if the proposed transition timelines and other considerations are respected.
15. We must again stress that our support to move to a revised band plan is contingent on all licensees receiving fully contiguous spectrum in all licence areas after the

band has transitioned. While operators may be able to temporarily manage fragmented spectrum in rural areas for an extended transition period, all urban areas must be fully contiguous at transition. Without the spectral and deployment efficiency gains resulting from fully contiguous spectrum, the incentive for operators to invest in deploying new base station radios across the country is much diminished.

16. We note that the current Canadian BRS 2500 MHz spectrum band is supported by two distinct 3rd Generation Partnership Project (3GPP) band plans. The current paired FDD frequency range (2500-2570 / 2620-2690 MHz) uses equipment that leverages 3GPP Band 7, while the current unpaired TDD frequency range (2570-2620) uses 3GPP Band 38 equipment. Following the band plan revision, all Canadian operators will transition to 3GPP Band 41 equipment (TDD 2496-2690 MHz) – also styled as n41 when specifying 5G NR equipment.
17. The current BRS 2500 MHz band plan has been deployed across Canada for more than a decade. Indeed, Rogers has met or exceeded all deployment requirements for our 2500 MHz spectrum, and Table 1 below shows that, in aggregate, Canadian operators have deployed nearly 16,000 BRS 2500 MHz macro sites for both FDD and TDD spectrum. Once small cell and in-building deployments are included, that number rises to more than 18,000 sites.
18. Replacing these Band 7 and Band 38 radios will thus require significant investments from licensees. This is not necessarily net new costs, as operators would have expected to make much of these investments over time through natural network enhancements resulting from refarming spectrum from 4G deployments and deploying 5G (or future 6G) equipment. We also note there could be potential savings where current FDD and TDD spectrum deployments can be consolidated into a single TDD deployment (along with accompanying operational cost savings). However, Table 1 does give a sense of the scale that operators will be managing for the transition.

**Table 1. Estimated Number of Current 2500 MHz Sites**

Site Type	National	Near-National / Regional Incumbent	Other	Total
Macro	12,817	2,942	38	15,797
Small cell	1,531	4	0	1,535
In-building	987	117	0	1,104
<b>TOTAL</b>	<b>15,335</b>	<b>3,063</b>	<b>38</b>	<b>18,436</b>

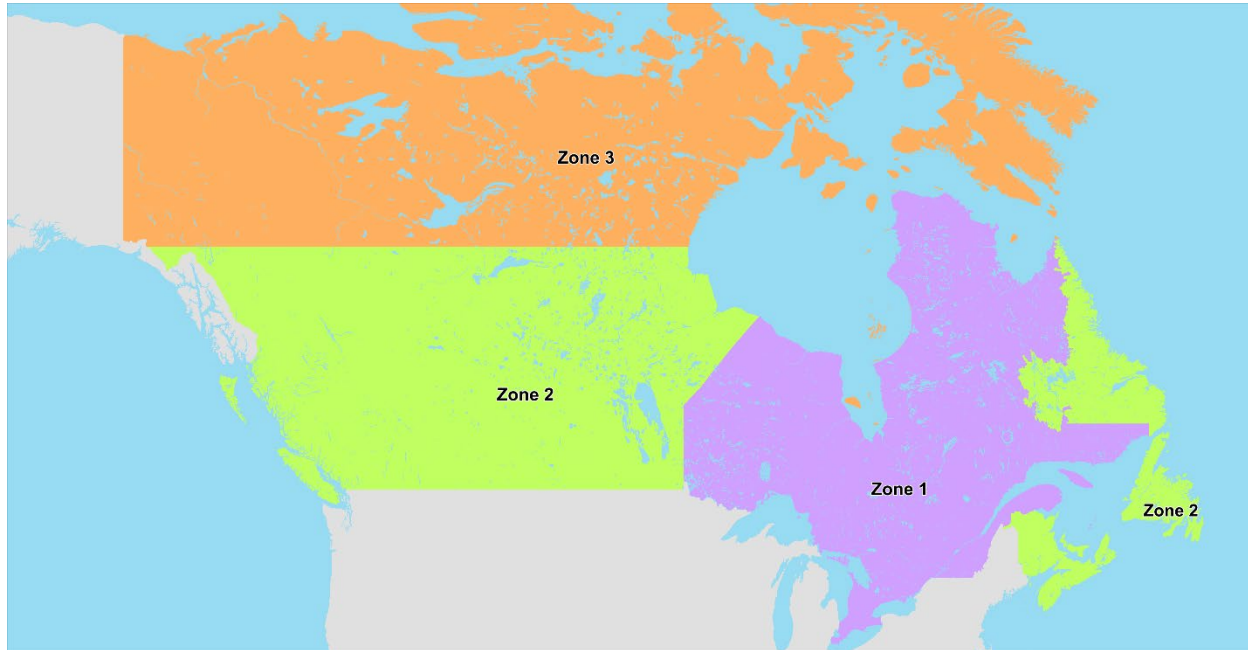
**Notes:** Total number of sites based on review of ISED SMS site database, March 2026

19. Again, while licensees would have expected to replace most of these radios over time, the timing of some spectrum refarming investments might be pulled forward and more recent legacy deployments may not have fully depreciated, particularly those in rural areas. As such mobile network operators will need to carefully manage the transition and ensure they maximize the benefits through fully contiguous spectrum following the transition.

### **Proposed Transition Timing and Process**

20. To help Canadian operators prepare and manage costs related to the band plan transition, Rogers recommends that the transition process be completed in three stages, with deployments starting in 2029 and the actual transitions to start in 2033 for the first stage. While 2033 may seem rather far in the future at first glance, this is based on a reasonable workback schedule that ensures that all stakeholders, large and small, are able to fully align with an industry-wide transition. Our workback schedule is also based, in part, on the Consultation's assertion that, "ISED intends to include a more detailed band plan, establishing block sizes, as part of a **future** consultation." [Emphasis added.]
21. We are assuming the Department consults on and publishes a final band plan decision by mid-2027 and publishes updated technical standards for the revised band plan sometime in late 2027. This will give facilities-based operators a year (2028) to work with equipment suppliers to ensure base stations (and handsets) are compliant with Canadian regulations and ready for ISED-certification. During 2028, operators would also be undergoing detailed forecasting and logistics to begin deployments of new radios, which would then start to be deployed in operators' 2029 build-cycle. The first transition would then take place in 2033. This would provide sufficient time for larger operators to deploy to their larger number of sites across the country, respect the resource constraints for smaller operators to deploy within their networks, while providing operators big and small sufficient time to manage capital investments. Scheduling the operational start of the band plan transition for 2033 would also allow all operators to successfully coordinate the actual transition to take place as a large-scale, single night "cut-over".
22. As has been demonstrated with the international cross-border coexistence issues, the common occurrence of harmful interference over long distances (up to 120 km) caused by tower-to-tower interference between FDD and TDD systems means that careful planning must be done to ensure coexistence between two geographic areas. Dividing Canada into isolated geographic areas can be challenging since much of the Canadian population is spread over continuous areas. Based on working-level engineering discussions with industry stakeholders, transitioning in three geographic divisions is appropriate. See Figure 1 below for proposed areas.

**Figure 1. Proposed 3-Zone Transition Map**



23. The first stage of the transition should take place in 2033, which we refer to as Zone 1. This would include Ontario and most of Québec, with the Atlantic portion of Gaspé peninsula excluded. Zone 2's transition would take place in 2035, and include British Columbia, Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, plus the Atlantic portion of the Gaspé peninsula of Québec. The final stage, Zone 3 covering Nunavut, Northwest Territories and Yukon would be scheduled for 2036.

### **Auctioning Unassigned BRS Spectrum**

24. An additional benefit of setting the transition date of the first actual cut-over in 2033 is that it will provide the Department with more than sufficient time to have a licensing policy consultation and run a competitive auction for the current BRS 2500 MHz intra-guard band TDD spectrum.

25. Rogers recommends that this include both unassigned TDD spectrum held by ISED, as well as any currently assigned spectrum within the two 5 MHz restricted bands, 2570-2575 MHz and 2615-2620 MHz. We note that this spectrum is impaired owing to the restrictions that the Department adopted to mitigate interference between systems operating in the paired and unpaired spectrum inherent with the current Canadian band plan. In fact, this spectrum is effectively sterilized in Canada, as Band 38 radios have more stringent filtering to protect Band 7 FDD deployments. As such, current Canadian TDD licensees cannot typically operate their currently deployed network equipment within the guard band

spectrum even if the restrictions were lifted, since they would need to deploy Band 41 radios.

26. For certainty, Rogers acknowledges under our proposal that we ourselves would be required to surrender our current restricted TDD holdings for re-auctioning.
27. Irregardless of any decision regarding currently assigned restricted 2500 MHz TDD holdings, there is currently nearly 300 million MHzPops of unassigned TDD spectrum in Canada. There is 5-10MHz of unassigned TDD spectrum in every provincial Tier 3 licence area across the country, excepting in Saskatchewan and Manitoba, plus all three Tier 4 Territory licence areas, for a total of 56 BRS licence areas. Indeed, there is a full 10 MHz of unassigned TDD spectrum in some of Canada's largest markets, including 3-025 Toronto, 3-013 Montreal, 3-052 Vancouver, and 3-015 Ottawa. This is extremely valuable mid-band spectrum that could be made available to network operators in the revised band plan in order to further enhance mobile service experience for Canadians across the country, and support additional economic efficiency growth.
28. As part of any licensing process for the (unassigned) restricted TDD spectrum, the Department should adopt rules similar to the 3500 MHz transition process to support making the band contiguous. All transition BRS spectrum from the former band plan could be included in the licensing assignment round, with all licensees guaranteed contiguity with both existing licences and any new spectrum potentially acquired in an auction acquisition phase. This would allow licensees to express their preference for assignment within the new band plan, including for those TDD licensees that wish to remain in their current frequencies.
29. Requiring all current BRS spectrum licensees (both FDD and TDD) to potentially receive reassigned frequencies could help ensure all parties acquire contiguous spectrum but may be opposed by some TDD licensees who have deployed equipment that is not sufficiently frequency agile across the entire future BRS spectrum band. Again, those operators who desire to continue using their Band 38 equipment can bid for their preferred frequencies.
30. For certainty, regardless of any decision around the return of restricted TDD spectrum to be re-licensed through a competitive process, all licensees should be required to be subject to the reassignment of frequencies across the entire new TDD band plan. As highlighted above, Band 38 radios have more stringent filtering to protect Band 7 FDD deployments. As such, they cannot operate in the guard band spectrum. In order to operate in the current guard band blocks separating the TDD and FDD portions of the band, they would need to deploy Band 41 radios, which would be frequency agile enough to be reassigned anywhere within the

band. This would ensure that all licensees post-transition fully benefit from contiguous spectrum.

31. In order to more efficiently manage the band, Rogers would support current licensees holding restricted TDD spectrum receiving incentive payments from auction proceeds, similar to the U.S. C-band auctions. If the Department were concerned about creating a precedent about direct incentive payments, they could alternatively create a fund to support equipment transition, perhaps even targeted to rural and remote areas. Rogers would support a portion of auction proceeds being made available to facilitate the transition, particularly in rural areas, even in the event that ISED elected not to make currently assigned restricted TDD holdings available for auction.
32. The remainder of Rogers' comments respond to the specific issues raised in the Consultation.

Q1: ISED is seeking comments on its proposal to revise the band plan to an unpaired band plan in 2500-2690 MHz.

In providing comments, respondents are requested to include supporting rationale and arguments.

33. Rogers fully supports the Consultation proposal to revise the BRS band plan to an unpaired band plan in 2500-2690 MHz. There are several important reasons for adopting this transition, including cross-border coexistence, equipment benefits (both infrastructure and handsets), and spectral efficiency gains from defragmentation. Through careful and coordinated planning, Canadian network operators can successfully manage the proposed migration for the benefit of Canadian mobile customers, but only if the proposed transition timelines and considerations are respected. We again note that our support of the proposal is contingent on licensees receiving fully contiguous spectrum in all licence areas after the band has transitioned. While operators may be able to temporarily manage fragmented spectrum in rural areas for an extended transition period, all urban areas must be fully contiguous at transition. This approach will improve the economics of a transition of this magnitude.
34. As highlighted above, Canadian operators began encountering harmful interference to their 2500 MHz paired (FDD) systems around 2014, particularly in the Windsor, Sarnia, and Niagara regions. This interference was traced to coexistence issues between Canadian FDD and U.S. TDD operations, where tall-tower deployments could result in cross-border interference at distances of up to 120 km. Operators on both sides of the border worked amicably to minimize impacts, with measures such as U.S. operators agreeing to limit use to the 2570-2620 MHz range near the border and all operators optimizing antenna configurations to mitigate interference. As demand grew, U.S. operators sought additional 2500 MHz bandwidth, prompting renewed coordination beginning in 2018 to protect Canadian uplink operations within the border zone from Lake Erie and Lake Huron.
35. By 2022, U.S. operator T-Mobile requested additional interference-management solutions across major border markets such as Detroit and Buffalo, leading Canadian licensees to form a coalition of five operators. With aligned objectives to preserve spectrum utility in major population centres on both sides of the border, negotiations expanded to include the Vermont Telephone Company and culminated in a formal agreement in 2024. Although major Canadian urban markets remained largely interference-free, operators were required to make

concessions in smaller regions, including Windsor/Sarnia, Victoria, Niagara, Kingston–St. Lawrence, and Southern Québec, rendering some 2500 MHz holdings temporarily unusable. Harmonizing the Canadian 2500 MHz band plan with the U.S. approach is expected to eliminate these coexistence challenges and restore spectrum availability for Canadian operators in affected border regions. This will ultimately enhance the service Canadian operators can provide to their customers.

36. Beyond the mitigation of the current cross-border interference issues in the BRS 2500 MHz band, aligning with the current U.S.-based band plan will have at least three additional, long-term benefits for Canadian operators and wireless consumers. These benefits include efficiency gains in both handsets and base stations, while allowing for band defragmentation to provide greater spectral efficiency.
37. First, the use of TDD for fixed and mobile services has been proven to be more spectrally efficient than traditional FDD. Typically using a duty-cycle of 75%-downlink to 25%-uplink, the division of data can be tailored to better suit the needs of end users. In the past, FDD systems were generally favoured over TDD systems, due to the lower cost of producing consumer devices. However, in the past 10 to 15 years, the device ecosystem support for TDD has significantly expanded, driving economies-of-scale and, hence, lower cost. This has allowed operators to further optimize their network deployments to meet Canadian consumers' data demands.
38. Second, primarily driven by the U.S. market, network base station equipment supporting the unpaired band plan, referred to as the 3GPP Band 41, provides access to cutting-edge technology such as Massive Multiple-Input Multiple-Output (MIMO) antenna array base stations, capable of beam-steering. Beam-steering technology is more spectrally efficient than legacy fixed pattern antennas, as it better focuses energy in the direction of the user, thereby reducing unwanted interference in other directions. Higher signal-to-noise ratios (S/N) correlates to higher data throughput and system reliability, again resulting in network benefits to end-users. Long-term, beam-steering could be useful in supporting Remotely Piloted Aircraft Systems (RPAS) aerial User Equipment (i.e., drones) in commercial mobile spectrum.
39. Third, moving to an unpaired band plan provides the opportunity for licensees to defragment their spectrum holdings, creating large, contiguous blocks of mid-band spectrum. In doing so, the spectral efficiency of the carrier will increase significantly, especially if the licensee is able to combine the FDD uplink and downlink portions with a mid-section TDD block, thereby defragmenting three



blocks of spectrum into one. This spectral efficiency from potential defragmentation will benefit all network deployments; however, it will provide additional benefits to operators that look to transition from legacy 4G to 5G (or future) technologies that can operate individual carriers of 100 MHz.

40. We again highlight that moving to fully contiguous TDD spectrum is a requirement to justify the costs to the wireless industry to transition band plans. Canadian 2500 MHz licensees like Rogers have invested heavily in FDD network equipment, so any proposal to effectively decommission this hardware must be carefully considered. Canadian telecoms operate within strict financial controls, which are needed to ensure the fiscal sustainability of these organizations. As highlighted above, the Canadian wireless industry, led by the three original national operators, invested \$3.6 billion in wireless networks in 2024, with Rogers alone investing \$1.6 billion in our wireless networks. While 4G BRS 2500 MHz FDD deployments would be refarmed over time, revision of the band plan may alter network deployment depreciation timelines, particularly outside urban centres.
41. Based on ISED's Spectrum Management System (SMS) Site Database, Rogers is the largest single operator of 2500 MHz FDD sites today with over 6,200 sites (macro, in-building, small-cell) across Canada. As can be seen above in Table 1, Canadian operators in aggregate have deployed over 18,000 sites using 2500 MHz spectrum – with FDD deployments accounting for 89%. With their long commitment to facilities-based competition, the original national operators are responsible for more than 83% of these total deployments Canada-wide, while newly national Videotron-Freedom accounts for another 9% (compared to more than 38% for Rogers alone). The other regional incumbents and small rural operators have also deployed nearly 1,400 sites using 2500 MHz spectrum. This represents significant investments by facilities-based network operators to help provide Canadians with world-class mobile connectivity that they demand and have come to expect and rely upon.
42. Beyond the cost, operators also require significant time and resources to complete the extensive network planning and actual deployments to replace widely-deployed network equipment. While the change from the current mixed band plan to a fully unpaired band plan will not have all the same requirements as a greenfield deployment of a new spectrum band or network expansion into previously undeveloped areas, network uplifts and buildouts are still massively dependant on civil engineering, which can take significant time and resources to deploy. With an industry-wide transition, operators may also find themselves constrained in their ability to access all necessary specialized human resources for deploying new

radios in rural and remote areas, particularly as they must also balance increasing deployment requirements in other bands.

43. As such, large-scale deployments of new network equipment must be done in a staged approach, spread across multiple years, and over different regions of the county to ensure efficient use of resources. Network financial budgeting is typically considered over long cycles, such as 10-years. Therefore, there must be an understanding that industry stakeholders, both large and small, require full and direct input into the planning and execution of this proposed migration. Failure to consider industry inputs could be harmful to the financial health of these organizations, particularly smaller operators. Through careful capital and resource planning, Canadian network operators can successfully manage this migration but only if the recommended transition timelines and considerations are respected.
44. As demand for wireless broadband services continues to grow, whether fixed or mobile, the need for higher bandwidth and spectrally efficient services will drive the demand for deploying modernized radio systems. The legacy FDD 2500 MHz LTE networks have served Canada well over the last 15 years. With the appropriate measures in place, Canadians and the economy will benefit from the migration of this spectrum to support next-generation services in the proposed band plan.

Q2: ISED is seeking comments on whether starting the transition to an unpaired band plan in 2028 is appropriate and how long licensees may require to complete the transition.

45. Although the industry has contemplated a potential transition to an unpaired band plan for some time, with Rogers recommending the Department explore the issue at least as far back as our comments in the *Spectrum Outlook 2022 to 2026* consultation,<sup>6</sup> and informally discussed amongst Canadian operators as part of the ongoing discussions related to cross-border coexistence, to date most discussions have been high-level and without any regulatory certainty. The migration of widely-deployed network equipment from the current paired-block plan to a fully unpaired plan will require significant investment for the telecom industry. Although we believe the proposed transition to ultimately be favourable to both Canadians and industry, it must be carefully planned out, to ensure that the capital planning,

<sup>6</sup> Rogers Comments, para 155, SPB-005-22: *Consultation on the Spectrum Outlook 2022 to 2026*.

network investments, and resource availability are feasible for all network operators.

46. As detailed below, Rogers recommends that the transition process be completed in three stages, with deployments starting in 2029 and the actual transitions to start in 2033. While this may seem rather far in the future at first glance, this assumes the Department consults on and publishes a detailed band plan decision no later than mid-2027, and consultations with the RABC on an updated RSS-199 result in a revised publication sometime in late 2027. This will then provide one full year (2028) for industry to work with equipment suppliers to ensure base stations (and handsets) are compliant with Canadian regulations and will be ISED-certified. During 2028, operators would also be undergoing detailed forecasting and logistics to begin deployments of new radios, which would then start to be deployed in operators' 2029 build-cycle.
47. For certainty, it is simply not be feasible for any operator to install a second set of 2500 MHz equipment at all locations across the country within one year. This is unfeasible both financially and logistically, individually, and even more challenging when considering that the band plan transition will apply to all Canadian operators. Further, due to the potential risk of harmful interference between legacy FDD systems and modern TDD systems operating at the same frequencies in Canada, similar to the cross-border interference case with the U.S., large geographic areas must be coordinated and migrated at the same time.
48. As an outgrowth of the cooperation amongst Canadian network operators to coordinate with our U.S. counterparts, some high-level contemplation of a potential transition plan has already taken place. An industry-led technical working group, composed of representatives from all 2500 MHz licensees, considered the possibility of dividing Canada into different geographic areas, with each of these areas being sufficiently isolated from one another to permit coexistence between both technologies. This proposed division would consist of three zones, each with sufficient distance from one another to permit safe coexistence between stages. A map of these proposed divisions area is shown above in Figure 1.
49. The first area would consist of the entire province of Ontario, as well as most of the province of Quebec, with the exclusion of the eastern-most (Atlantic) portion of the Gaspé peninsula. We refer to this area as "Zone 1", and it would transition to the new band plan in May 2033.
50. The second area would consist of all remaining provinces, plus the eastern Gaspé area, which we refer to as "Zone 2". Based on current deployments, all Canadian operators believe that there is a natural geographic break between the St.

Lawrence portion of the Gaspé and the Atlantic portion. For clarity, a “buffer” zone would be created between the two areas within which operations would only be permitted on a no-interference-no-protection basis during the transition. The proposed eastern buffer zone between Zone 1 and Zone 2 is shown below.

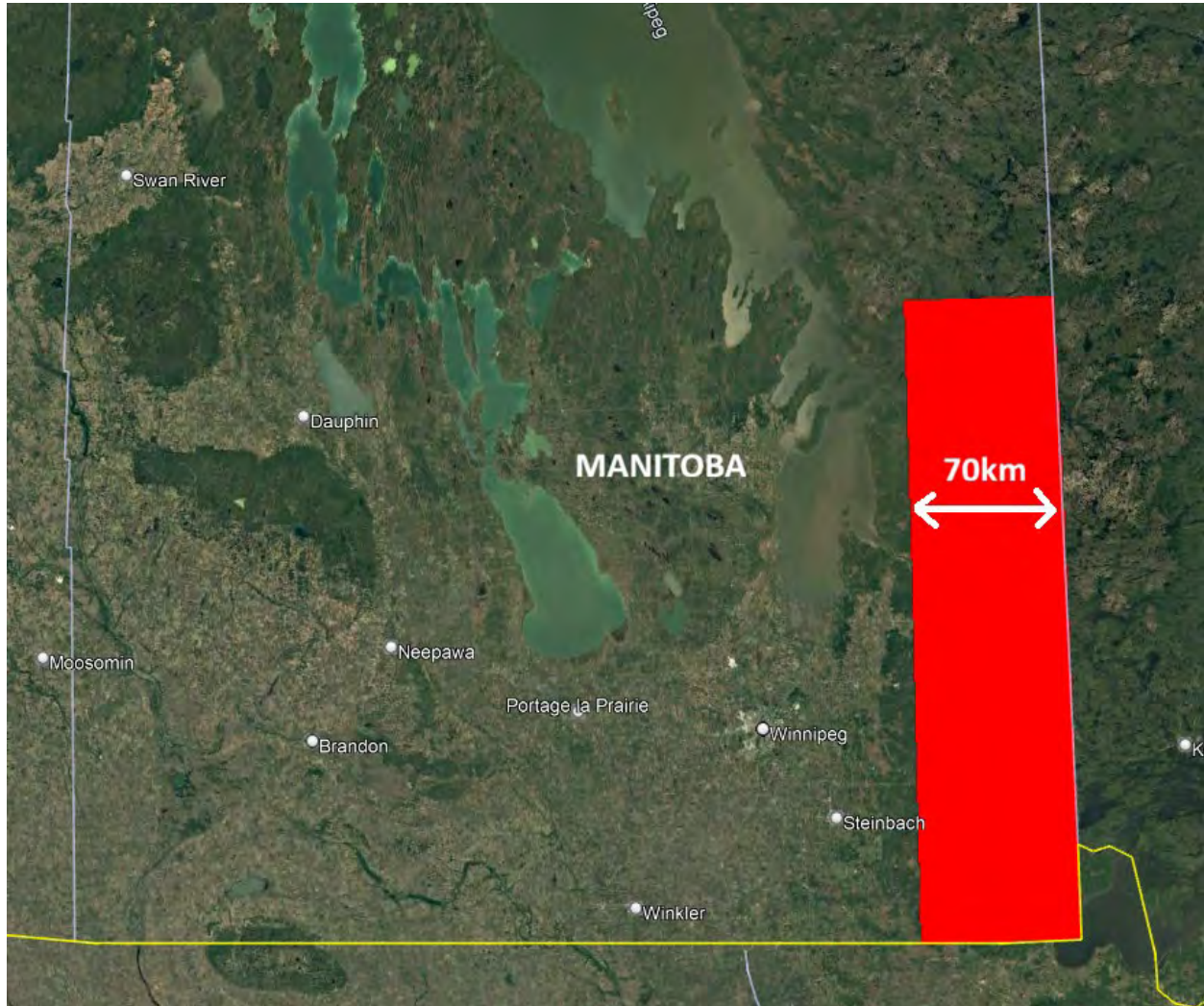
**Figure 2. Map of Proposed Buffer Zone between Quebec / Atlantic Canada**



51. Moreover, operators have noted that the Ontario-Manitoba border area is relatively lightly populated and, therefore, a buffer zone could also feasibly be created in that area as well. The proposed Zone 2 would be scheduled for transition in May 2035. The proposed western buffer zone between Zone 1 and Zone 2 is shown below.

52. We note that the proposed buffer zone between Zone 1 and Zone 2 is just 70 km, when we highlight elsewhere that tower-to-tower interference distance has been experienced up to approximately 120 km. Although 70 km is less than the 120 km distance required for no interference, industry discussions have indicated that licensees are willing to agree to coordinate site optimization and accepting of some slight impairment in order to limit the size of the buffer zone.

**Figure 3. Map of Proposed Buffer Zone between Ontario / Manitoba**



53. The third and final area would include the three northern territories, Nunavut, the Northwest Territories and Yukon. Again, licensees agreed that the border zone between the Far North and the provinces could be managed through a buffer zone during the transition period. We note that, due to the remoteness of the provincial-territories border area, there are a limited number of currently deployed sites, so a defined buffer zone is not required. Rogers recommends that impacted licensees coordinate amongst themselves, ensuring maximum flexibility and efficiency. We refer to this third area as “Zone 3”, and it would transition in May 2036.
54. Rogers’ recommendation is for the Department to work with all licensees and formally adopt the proposed schedule as discussed in the industry work-group, including the proposed transition timelines of Zone 1 in May 2033, Zone 2 in May 2035, and Zone 3 in May 2036. The rationale for selecting these dates is based on previous experience with band plan transitions (e.g., 3500 MHz, which moved



from FDD FWA to TDD flexible use) and an estimate of the capital and network planning processes of all 2500 MHz licensees, including national and near-national operators, regional incumbents, and small and rural operators.

55. After some initial planning of the required uplift to the Rogers network, we estimate that it will require a minimum of four years to completely deploy new unpaired (Band 41) equipment to Zone 1, since it accounts for approximately 80% of our currently deployed 2500 MHz FDD radio base. This timeline also considers that this is not a new spectrum band being deployed for new radio features or to add additional capacity over time, but part of large, regional cutovers of a band that Canadian wireless customers currently depend on to deliver the world-class services they demand (and receive). The 2500 MHz band supports both mobile and fixed wireless access for Rogers and other licensees, so it cannot be allowed to lay fallow.
56. Due to the competing demands for capital for existing wireline and wireless network capacity and coverage expansion, it would not be practical to deploy within a shorter timeframe than four years. Assuming our timeline recommendation is adopted, Rogers would undergo detailed network planning and deployment of modern equipment in 2029, 2030, 2031, and 2032. Again, this timeline assumes a revised RSS-199 is published sometime in 2027 to allow sufficient time to work with equipment suppliers on the new Canadian BRS 2500 MHz band ecosystem. Following the successful deployment of unpaired equipment by around year-end 2032, we would be prepared for the network transition (i.e. a large scale, one-night cut-over) in May 2033.
57. Although hardware could also start to be deployed to Zone 2 starting in 2029, competing network investments would make the full funding of new BRS radios in multiple zones suboptimal for enhancing network coverage and capacity in other bands. As such, we would expect investments for Zone 2 would ramp up starting in 2033 and concluded around year-end 2034, with the transition to the fully unpaired band occurring in May 2035.
58. Considering the remoteness and deployment challenges with Zone 3, the transition to unpaired could occur in May 2036.

Q3: ISED is seeking comments on whether deployment requirements should be adjusted in anticipation of transition to the new band plan.

59. Rogers has met all deployment requirements for 2500 MHz FDD (and TDD), so we do not anticipate any issues prior to the transition. That said, we fully support adjusting any requirements needed should a licensee not be able to fully use their spectrum due to cross-border interference, including as the result of any voluntary coordination agreements with Canadian or U.S. operators needed to maximize spectrum utilization in border areas.
60. Understanding that some operators may not have fully completed their planned deployments, we acknowledge that the Department may adjust requirements to “provide operators with additional flexibility to align capital investments with future infrastructure and equipment upgrades.”<sup>7</sup> We would also support any deployment requirements adjustments whereby some specific coverage may be reduced, should there be technical issues with deploying equipment close to the transition timeline. These adjustments to deployment requirements will prevent the need for costly stranded deployments or minimize the need for unnecessary equipment replacements, thereby ensuring a smoother transition for all parties involved.
61. We also support the relaxation of deployment requirements following the transition to the new band plan. Licensees will strive to execute as many installations prior to the changeover as possible, however, it may not be possible for all to fully meet this commitment. To ensure a successful migration by all, providing a grace period of five years (5-years) after the transition date for each zone would be a fair and reasonable approach.

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<sup>7</sup> ISED, *Consultation*, para 19.

Q4: ISED is seeking preliminary comments on a transition plan to the proposed band plan, including:

- a. should the transition strategy be implemented on a market-by-market basis across Canada? If so, which regions should be prioritized and how should the timelines be staggered?
- b. should certain portions of the band, such as the Canadian FDD uplink spectrum, be prioritized first during the transition?
- c. do licensees prefer holding contiguous blocks of spectrum in an unpaired TDD-use band plan? If so, what process is envisioned to enable the exchange of frequency assignments?
- d. what is the appropriate tier level for the transition and how might the deployment requirements be adjusted to reflect this?
- e. are there any temporary or longer term technical requirements that ISED should consider to minimize the potential for interference conflicts during the transition period?
- f. are there any other key elements that ISED should consider for a transition plan?

In providing comments, respondents are requested to include supporting rationale and arguments.

#### **Q4 a. Transition market/region strategy**

62. Due to the common occurrence of harmful interference over long distances (up to 120 km) caused by tower-to-tower interference between FDD and TDD systems, careful planning must be done to ensure coexistence between two geographic areas. Dividing Canada into isolated geographic areas can be challenging since much of the Canadian population is spread over continuous areas. Nevertheless, as discussed above, we believe our proposed three geographic divisions is appropriate – see Figure 1 above.

- **Zone 1** – Ontario/Québec with the Atlantic portion of Gaspé peninsula excluded.
- **Zone 2** – British Columbia, Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, plus the Atlantic portion of the Gaspé peninsula of Québec
- **Zone 3** – Nunavut, Northwest Territories and Yukon



63. The timelines for transitioning these areas should be as follows:

- **Zone 1** – May 2033
- **Zone 2** – May 2035
- **Zone 3** – May 2036

#### **Q4 b. Prioritization of certain portions of the band**

64. Although prioritization of certain portions of the band, such as the Canadian FDD uplink spectrum, was considered as a possible option by the industry-led technical working group, the Department should reject any recommendations for such an option. The most optimal option for most Canadians would be to maintain the current band plan right up until the transition and then to immediately migrate to the new band plan (i.e., a large-scale, single-night cut-over).

65. The reason that this is the best option is that network operators with 2500 MHz FDD licences will generally architect their wireless networks for full FDD service, supported by both the uplink and the downlink channels. Managing a downlink-only configuration for FDD, plus a narrow TDD channel simultaneously, would result in significant network capacity impairment for some period of time. This inefficient configuration would ultimately not meet the demands of Canadian wireless customers.

#### **Q4 c. Contiguous blocks / frequency assignment process**

66. To improve the economics and help justify the substantial cost of this migration, we recommend the Department support the complete defragmentation of the BRS 2500 MHz spectrum band in order to provide fully contiguous assignments. While there may be some flexibility to provide a slightly extended transition period in remote areas, all urban BRS 2500 MHz spectrum would need to be fully contiguous as of the cut-over transition date. Without this important benefit, the business case for proceeding with this transition would change significantly. As such, we believe that the full defragmentation of spectrum for all licensees must occur as part of this migration.

67. Should the Department move forward quickly with a licensing process for the unassigned internal TDD guard band spectrum, the Department could adopt rules similar to the 3500 MHz transition process. All transition BRS spectrum from the former band plan could be included in the assignment round, with all licensees guaranteed contiguity with both existing licences and any new spectrum acquired in the acquisition phase. This would allow licensees to express their preference for

assignment within the new band plan, including for those TDD licensees that wish to remain in their current frequencies.

68. Requiring all current BRS spectrum licensees (both FDD and TDD) to potentially receive reassigned frequencies could help ensure all parties acquire contiguous spectrum but may be opposed by some TDD licensees who have deployed equipment that is not sufficiently frequency agile across the entire future BRS spectrum band. However, in the long-term, we fully expect all operators to migrate to Band 41 LTE or n41 5G systems, thus having the frequency agility to move anywhere in the new band.
69. A competitive process for frequency assignments that includes auctioning unassigned 2500 MHz spectrum is the ideal solution to create contiguous holdings and maximize the economic and social benefits that Canadians derive from the use of the radio frequency spectrum resource.

#### **Q4 d. Appropriate tier level for the transition**

70. We recommend that the Tier 3 level be used for transitions. Deployment requirements should be migrated with the licensee, rather than staying with the frequency blocks.
71. While we do not think there needs to be any long-term adjustment to deployment requirements, as noted above, we do support the relaxation of deployment requirements following the transition to the new band plan. To ensure a successful migration by all, providing a grace period of five years (5-years) after the transition date for each zone would be a fair and reasonable approach.

#### **Q4 e. Potential technical requirements during transition period**

72. Rogers does not recommend using transition periods per se. Since the three proposed zones are geographically isolated, the transition can occur in one night. Similar to spectrum transitions during the migration of 3500 MHz from fixed wireless access to flexible use, single-night transitions are the most effective way to ensure that all parties migrate simultaneously to the new band plan. The key to their success is ensuring ample advanced notice so that networks can be properly readied for the change.
73. Assuming that transitions occur as single-night cutovers, there should be minimal interference conflicts during the transition. Additionally, with the creation of no-interference, no-protection (NINP) buffer zones, operators can rely on business-as-

usual coordination practices to maximize coexistence to the greatest extent possible.

**Q4 f. Any other key elements that ISED should consider for a transition plan**

74. If the Department were to elect to not have all BRS spectrum licences be subject to frequency re-assignment, only re-assigning current FDD licences, the defragmentation of frequency blocks into contiguous spectrum at the Tier 3 level would pose a challenge in some licence areas. This is due to the uneven number (7) of paired blocks on either the upper or lower sides of the band. Pairing two 10 MHz blocks results in one contiguous block of 20 MHz. This becomes an issue when moving four 20 MHz block-pairs (80 MHz total) into either the upper or lower 70 MHz band segments and could result in some licensees receiving non-contiguous spectrum, which would be unacceptable.
75. We again note that some mid-band unpaired licensees operate band-limited equipment (i.e. Band 38), so they could potentially be reluctant to be reassigned. However, as noted above, in the long-term, we fully expect all operators to migrate to Band 41 LTE or n41 5G systems, thus having the frequency agility to move anywhere in the new band. Furthermore, as most current band plan TDD licensees hold both FDD and TDD spectrum in many (though not all) licence areas, they will naturally desire to have all their holdings made contiguous and need to deploy using Band 41. BRS licensees that hold FDD and TDD licences in the same Tier 3 area includes Rogers, Bell, Telus, Quebecor, Xplore, SaskTel, and Cogeco. Our understanding is there is only a single licensee that only holds TDD spectrum, Ecotel, and the SMS database lists just 5 total sites for them in the band.
76. We do not believe the limited number of TDD-only licensees and deployments should be a reason to not move towards the successful re-assignment of all BRS 2500 MHz frequencies to provide all licensees with fully contiguous spectrum. The benefits to mobile network operators and Canadian wireless consumers are substantial and the re-assignment to create contiguous spectrum holdings for licensees, particularly in urban areas, is needed to help justify the significant investments by Canadian facilities-based operators.
77. We continue to support the Department using auction proceeds, or potentially allowing access to other government or Canadian Radio-television and Telecommunications Commission network deployment funds, to provide financial assistance to incumbent TDD operators to migrate to the new band plan.
78. Rogers thanks the Department for the opportunity to share its views and participate in this consultation process.