



**TELUS COMMUNICATIONS INC.**

**Reply Comments for**  
**Consultation on the Revisions to the**  
**2500-2690 MHz Band Plan**

SPB-002-26  
January 2026  
Spectrum Management and Telecommunications

**April 28, 2026**

## Table of Contents

<b>Executive Summary</b>	<b>3</b>
Establishing a clear regulatory framework	5
<b>TELUS' reply comments on specific questions posed by ISED</b>	<b>10</b>
Q1: Rebanding the BRS band plan to TDD	10
Q2: Transition timing	15
The regulatory starting line	15
Regulatory preconditions for a feasible transition roadmap	16
An industry-led approach for transition timelines	18
Issuing interim overlay TDD licences while FDD licences are still in effect	21
Q3: Deployment requirements	24
Q4: Preliminary considerations for a transition plan	30
(a) Industry defined transition zones	30
(b) No prioritization of any portion of band	32
(c) Contiguity of blocks	33
(d) Geographic aspects of transition	37
(e) Technical considerations	38
(f) Additional considerations	39

## Executive Summary

1. TELUS appreciates the opportunity to submit follow-up reply comments to the *Consultation on the Revisions to the 2500-2690 MHz Band Plan* (“the Consultation”)<sup>1</sup>.
2. The 2500 MHz band is a critical mid-band resource for Canadian facilities-based operators. Transforming this band to an unpaired Time Division Duplex (TDD) configuration is an essential priority to support the continued deployment of high-capacity 5G networks and prepare Canada for the future evolution of 6G.
3. The initial comments submitted by stakeholders demonstrate a broad, resounding industry consensus: transitioning to an unpaired TDD band plan is necessary. Operators overwhelmingly agree that aligning Canada’s band plan with the U.S. aligned TDD Band 41 ecosystem is clearly the sustainable way to resolve persistent cross-border interference, maximize spectral efficiency, and leverage global economies of scale for network equipment and consumer devices.
4. While recent efforts by Canadian and U.S. operators culminated in a December 2024 agreement to mitigate border interference, this very much is a set of temporary ‘band-aid’ coexistence measures requiring significant compromises to network capacity in highly populated areas. The ultimate aim for Canadian licensees remains full frequency and time synchronization alignment with the U.S. through this TDD transition.
5. An improvement in technical coexistence is not the only benefit of this transition. Combining FDD uplink and downlink spectrum into contiguous TDD assignments will

---

<sup>1</sup> *Consultation on the Revisions to the 2500-2690 MHz Band Plan*, Canada Gazette SPB-002-26, published January 2026. Link: <https://ISED-ISDE.CANADA.CA/site/spectrum-management-telecommunications/en/learn-more/key-documents/consultations/consultation-revisions-2500-2690-mhz-band-plan>

enable larger channel bandwidths. TDD channel reciprocity will enhance the benefit of massive MIMO technologies. Achieving fully contiguous spectrum blocks is critical to yielding these significant efficiency improvements.

6. While there is broad consensus on the destination, the initial submissions reveal instances of divergence regarding the regulatory roadmap required to get there. Stakeholders have presented a consensus view on transition timelines (along with a few bespoke incremental transition time suggestions), a broad policy adjustment to the deployment requirement conditions in the form of delayed assessments following transition, and a few bespoke views on regulatory mechanisms to determine frequency assignment.
7. TELUS' proposal, with some refinements, addresses the concerns of unnecessary investment and uncertain licensing risk that underpin these proposals which could otherwise delay transition beyond the target transition dates supported by the broad consensus of stakeholders.
8. However, Eastlink's opposition to the TDD transition, citing equipment replacement costs, is an outlier and should be dismissed. Blocking the TDD transition based on one regional operator's opposition would be a grave strategic error, isolating Canada from the global 5G/6G (n41/s41) ecosystem and permanently impairing critical BRS mid-band spectrum. The long-term cost of lost innovation and capacity far exceeds the transitional capital costs of replacing legacy radios.

## **Summary of TELUS' key reply comments proposals**

9. This transition represents a massive undertaking that will require substantial capital investment and regulatory clarity. In these reply comments, TELUS addresses opposing viewpoints and refines its original proposals to ensure the transition framework supports efficient spectrum utilization with appropriate regulatory treatment.

### ***Establishing a clear regulatory framework***

10. TELUS recommends that ISED adopt a defined TDD band plan that provides the regulatory certainty necessary for investment planning. This band plan, similar to the U.S., should include the frequencies 2496-2500 MHz. This would maximize equipment alignment (and thus, availability), minimize unnecessary certification differences, and support the ecosystem development required for future technology cycles. A timely decision on the band plan, followed shortly thereafter with a new Radio Standards Specification (RSS) for the band, are both essential for network operators to prepare for the transition. Moreover, publishing updated standards in a timely manner is critical for infrastructure vendors to develop and certify radios for the Canadian market so that equipment becomes available in advance of the first transition timeline.
11. TELUS also proposes that ISED consult as soon as practically possible on the Standard Radio System Plan (SRSP) to ensure that technical frameworks support efficient deployment and coexistence during and after the transition periods.
12. Having both the RSS and SRSP will be critical to ensuring that operators can implement the transition smoothly and that the resulting n41 ecosystem is easily adopted into the Canadian market.

13. Finally, given that BRS licences of different origins (2015 auction, residual auctions, and legacy transitions) have dramatically different attributes (e.g., expiry dates, deployment requirements, etc.), any framework must preserve these fundamental attributes through the transition. TELUS recommends ISSED adopt an interim overlay licence approach which aligns with the solution being applied to mitigate cross-border BRS coexistence issues today.

#### ***Establishing a Framework for Contiguity and Assignment***

14. Frequency contiguity is a technical prerequisite for maximizing the efficiency of the 2500 MHz band. To make the best use of the new TDD band plan, TELUS supports an ISSED-led competitive auction specifically limited to the guard bands (2570-2575 MHz and 2615-2620 MHz) that would follow an auction consultation that encompasses, in some form, how to equitably re-licence the spectrum as 10 MHz blocks. Releasing these previously fallow blocks to the market, before frequency assignments, would be part and parcel of providing operators with unfragmented and unencumbered TDD spectrum for the next generation of investments.
15. Further, to successfully operationalize the exchange of frequency assignments for the rest of the band, TELUS strongly recommends an industry-led reassignment through an auction encompassing all frequencies from 2500-2690 MHz (keeping 2496-2500 MHz unallocated). An industry-led assignment mechanism allows stakeholders to resolve competing requests, formally express their locational preferences that incorporate the existing and newly auctioned guard band spectrum, to yield contiguous assignments. TELUS' refined proposal includes a frequency assignment auction involving the notion

of raising funds from “winners” to pay “losers” (based on a Vickrey mechanism) to mitigate transition costs anticipated under the stakeholder’s target transition dates.

16. The proceeds of an industry-led reassignment auction could be used to help recoup the industry's transition cost. If ISED retained the proceeds from an assignment of frequencies (that industry has previously already paid for once at auction) the proceeds would not be able to be used to help licensees in mitigating their transition costs. ISED has reported<sup>2</sup> that they have “no legal mechanism” to redirect auction proceeds to industry. Reinvesting proceeds in network deployment ensures that modernizing the 2500 MHz band does not hinder the expansion of wireless connectivity to all Canadians.

#### ***Maintaining Firm but Flexible Transition Timelines***

17. TELUS strongly opposes proposals by a minority of licensees to arbitrarily and unilaterally extend the transition timelines, stretching to as late as 2040 for completion. The industry-discussed timeline of 2033, 2035, and 2036 already provides nearly a decade of advance notice, affording all operators ample time to depreciate existing assets and integrate replacement costs into standard capital planning cycles.
18. Prolonging the transition would needlessly extend the period of spectrum fragmentation, compel operators to maintain complex and costly mixed FDD/TDD network environments, and ultimately delay the delivery of high-capacity 5G and 6G services to Canadians.

---

<sup>2</sup> Mr. Champagne (Minister of Innovation, Science and Industry) - Response of the government, pursuant to Standing Order 109, to the second report of the Standing Committee on Industry and Technology, *"Affordability and Accessibility of Telecommunications Services in Canada: Encouraging Competition to (Finally) Bridge the Digital Divide"* (Sessional Paper No. 8510-441-39), presented to the House on Friday, March 4, 2022. - Sessional Paper No. 8512-441-39. Link: [https://www.ourcommons.ca/content/Committee/441/INDU/GovResponse/RP11900441/441\\_INDU\\_Rpt02\\_GR/DepartmentOfIndustry-Telecommunications-e.pdf](https://www.ourcommons.ca/content/Committee/441/INDU/GovResponse/RP11900441/441_INDU_Rpt02_GR/DepartmentOfIndustry-Telecommunications-e.pdf), page 16.

### ***Pausing Deployment Assessments and Linking Network Investment to Licence Renewal***

19. TELUS reiterates that ISED must pause its assessment of compliance with deployment requirements during the transition. TELUS' proposal enables licensees that have met their mid-term FDD/TDD deployment requirements to pre-qualify for renewal, regardless of the state of their Band 41 deployment when licences are due for renewal (mid transition) and thus provide the regulatory certainty needed to commit to massive new infrastructure investments by all licensees.
20. In order to ensure the regulatory clarity required for such a significant undertaking as TDD transition, ISED should consult shortly after issuing a decision on this Consultation to determine the eligibility criteria for BRS licence renewals in 2035 and 2038.

### ***Conclusion***

21. To secure Canada's place in the global 5G and 6G ecosystem, TELUS is of the opinion that a successful transition framework requires rejecting arbitrary timeline delays, while allowing stakeholders to put forth positions of consensus. TELUS contends that a feasible transition framework demonstrating good governance combines:
  - a. Stakeholder-determined timelines;
  - b. Paused assessment of deployment requirements;
  - c. Seamless transition of licence conditions between FDD and TDD;
  - d. A near term decision on future licence renewal eligibility which recognizes existing network deployment;
  - e. Auction of restricted guard bands; and
  - f. An industry-led assignment auction



TELUS considers that this holistic approach will facilitate an orderly, cost-effective transition that maintains industry investment incentives, ensures regulatory certainty, and ultimately supports long term use for 5G Advanced and 6G to deliver the benefits of efficient spectrum utilization to Canadians.

22. Throughout this consultation process, TELUS advocates that ISED adopt the principle of being as unintrusive and minimally restrictive as possible during what will certainly be a disruptive period of network overhaul for MNOs.
23. TELUS reply comments and the detail behind TELUS' recommendations in response to the various questions raised by ISED follow in the main body of this document.

## TELUS' reply comments on specific questions posed by ISED

### Q1: Rebanding the BRS band plan to TDD

**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.

24. The historical divergence between Canada's 2010 adoption of the ITU FDD band plan and the US commitment to a TDD band plan (n41) has reached a delicate tipping point. Whilst Canadian operators originally favoured FDD to leverage the more mature Band 7 ecosystem, the aggressive expansion of U.S. 5G TDD networks has made cross-border interference a critical operational hurdle. Current mitigation strategies include licensees swapping blocks to share the interference burden while accepting secondary spectrum access in a subset of cross-border markets. Both are inefficient solutions that effectively waste significant amounts of this vital spectrum for two-thirds of the Canadian population. These coexistence measures are increasingly unpalatable and spectrally inefficient, highlighting a growing problem that requires a more permanent and spectrally efficient solution than current coordination agreements can afford Canadian MNOs.
25. TDD use is technically superior to FDD use of the same spectrum for advanced antenna technologies (e.g., active antenna systems employing massive MIMO) in 5G and beyond. Because the uplink and downlink in such systems use the same frequency, channel reciprocity allows base stations to predict downlink signal paths using pilot symbol estimates in the uplink. As a result, base stations can aim beams accurately at devices,

significantly boosting capacity without incurring a costly penalty of providing direct feedback of channel estimates. As MNOs deploy 5G in other TDD bands (most notably 3500 and 3800 MHz), New Radio (NR) has fundamentally changed the intrinsic spectrum configuration as TDD vs FDD offers highly efficient technical capabilities.

26. TELUS strongly agrees with ISED's rationale that transitioning to a TDD band plan is the most effective way to harmonize with the U.S. market to resolve persistent interference. Canadian MNOs also stand to benefit from the global economies of scale now offered by the n41 ecosystem in the U.S. and elsewhere. The TDD band plan should align fully with the band plan and allocation of 2496-2690 MHz (including the technical rules) found in the U.S. to ensure there are no encumbrances on both infrastructure and device certification for the Canadian market.
27. It is worth noting that in its November 2020 Decision<sup>3</sup>, ISED declined to approve the portion of Globalstar Canada's request for ATC authority that addressed the 2495-2500 MHz frequency range. TELUS notes aligning with the U.S. via the inclusion of 2496-2500 MHz in the flexible use TDD band plan would require the addition of a co-primary mobile allocation and the revision of Canadian Footnote C38<sup>4</sup> to restore co-primary status of the fixed service in that frequency range.

---

<sup>3</sup> *Decision on Globalstar Canada's Application for Ancillary Terrestrial Component (ATC) Authority in the 2.4 GHz Band (2483.5-2500 MHz)*, Canada Gazette SMSE-009-20, published November 2020. Link: <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/consultations/decision-globalstar-canadas-application-ancillary-terrestrial-component-atc-authority-24-ghz-band>

<sup>4</sup> *Canadian Table of Frequency Allocations*, 2022 Edition. Footnote C38 reads "C38 (CAN-04) In the frequency band 2 483.5-2 500 MHz, the fixed service has been reduced to secondary status with the implementation of the Low Earth Orbital (LEO) mobile-satellite service in Canada." Link: <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/consultations/canadian-table-frequency-allocations-sf10759>

28. Globalstar weighed in to recognize the TDD ecosystem benefits to Canadian operators as an interested stakeholder<sup>5</sup> while seeking protection for its operations in any new band plan. Globalstar advocates for protection for the MSS service in the 2483.5-2500 MHz. Existing MSS operations have supporting protection through coordination as specified under SRSP-517 (and any new revisions) with BRS operations. TELUS acknowledges that there is no reason to release the 2496-2500 MHz spectrum for mobile use as it would complicate coexistence at this time. Having the co-primary allocation, the US technical regulatory rules, and withholding the release of 2496-2500 MHz maintains the existing coexistence and operating environment to safeguard Globalstar's MSS operations in Canada (including along the border with its U.S. operations under n41).
29. Nearly all the MNO and fixed operator respondents (Bell, Cogeco, Rogers, SaskTel, Vidéotron, and Xplore<sup>6</sup> except Eastlink) supported transition towards the unpaired TDD band plan. As supported by TELUS, several MNOs (i.e., Bell, Rogers, and Vidéotron) specifically support the U.S. n41 band plan (2496-2690 MHz). Nokia recognizes a band plan spanning 2496-2690 MHz is necessary today and recommends a full alignment with the U.S. *"...to benefit from the current mature ecosystem and open the possibility to potentially profit from US development that are happening in the adjacent band towards an important mid-band 5G/6G spectrum..."* for Canada.
30. While TELUS acknowledges the transition reservations by some operators, accommodating Eastlink's proposal to stymie the TDD transition and its benefits would

---

<sup>5</sup> Page 2, *"...we agree that the TDD equipment ecosystem has grown substantially in recent years, and we recognize the potential benefits this could bring to Canadian operators..."*, Globalstar's comments to the Consultation

<sup>6</sup> Xplore support a TDD band plan with the details of band plan to be determined in a future consultation

be a grave strategic error. Eastlink's unceremonious comments to keep operating Band 7 FDD in the Consultation, while being a long standing and non-dissenting member of the stakeholder group, is a new development and at odds to the group's overall aim. Retaining the current mismatched band plan would isolate Canada from the substantive 5G n41 equipment ecosystem and severely limit advanced 6G TDD technology availability and its benefits in the future. A status quo band plan would forego the efficiencies of TDD massive MIMO (vs FDD), and permanently impair over a third (70 out of 190 MHz) of the critical BRS mid-band spectrum in Canada's most populous U.S. border markets, which was highlighted by nearly all stakeholder respondents<sup>7</sup> (all except Eastlink, who is unaffected by T-Mobile's operations). The long-term benefit to the Canadian digital economy in innovation, capacity, and spectral efficiency from a transition timeline that manages capital costs of replacing radios (i.e., over the prospective transition target dates that largely completes in 2035) far outweighs the financial risk of a limited accelerated equipment refresh cycle contemplated by Eastlink.

31. TELUS continues to recognize that migrating from FDD to TDD is a complex undertaking involving hundreds of millions of dollars in collective industry costs, including the development of new radio equipment, replacement of existing FDD radios and other operational expenses associated with a truck roll and site works at nearly every site in each operator's network. However, this approach, with TELUS' modest proposal to align with the U.S. is still one of the best feasible paths to ensuring all Canadians can benefit from this strategically important configuration of the band. TELUS commends

---

<sup>7</sup> Bell, Cogeco, Ecotel, Rogers, SaskTel, and Vidéotron view the current band plan being impairing much of the spectrum along the U.S. border

ISED for tabling a TDD transition roadmap for the BRS spectrum and reiterates its recommendation for full alignment with the U.S. n41 band plan.

## Q2: Transition timing

**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.

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

### *The regulatory starting line*

32. As a fundamental principle, ISED should not consider the imposition of a mandatory start date (i.e., 2028) or timeline for BRS rebanding. Rather, ISED's role in the rebanding process should firmly focus on facilitating and establishing the necessary technical and regulatory conditions as soon as practically possible, thereby permitting licensees to transition from FDD to TDD at an optimal time that is mutually negotiated by industry.
33. This approach ensures that each operator can start and complete transitioning within the industry's currently discussed regional phases and time window that accommodates all BRS licensees whilst recognizing and allowing different parts of the country to start and finish at different points in time. TELUS's view of the regional phases are shared in its response to Question 4(a) below.
34. Critically, the Consultation's proposed 2028 transition start is impractical. Before any transition can begin, ISED must publish a full TDD band plan and policy framework and establish the technical RSS and SRSP standards. Based on TELUS' past experience, some infrastructure vendors developing or adapting hardware products for a market generally require a minimum lead time of approximately two years from the publication of final technical standards and band plan decisions to develop, test, and deliver new TDD-capable equipment. TELUS considers that from an equipment availability

viewpoint alone, the initial transition readiness in the Canadian markets would not be feasible until 2029-2030.

***Regulatory preconditions for a feasible transition roadmap***

35. Before the transition can proceed, TELUS identifies the following critical preconditions that must be satisfied:

a. **Establishment of a band plan:** ISED must develop a TDD band plan (in consultation with the industry) and appropriately revise spectrum allocations in the Canadian Table of Frequency Allocations (as discussed in TELUS' response to Question 1) to create optimal alignment with the U.S. band plan and the 3GPP Band 41. The band plan must entail the minor expansion of the current allocation to span 2496-2690 MHz to primarily leverage the U.S. ecosystem of radio and devices. The revised Canadian band plan should:

- i. Maintain the existing 10 MHz block size (noting the new exception of 2496-2500 MHz<sup>8</sup> that should not be released);
- ii. Allow for the restricted bands of two 5 MHz blocks (in band 38) to be coupled as a contiguous 10 MHz TDD block; and
- iii. Apply Tier 3 licensing<sup>9</sup> that is consistent with the existing policy and licensing regime.

b. **Finalization of 2500 MHz technical standards:** It is essential that ISED revise RSS-199 as a critical next step following a TDD band plan decision to afford

---

<sup>8</sup> ISED's policy decision does not need to assign the 2496-2500 MHz spectrum as a precondition for rebanding.

<sup>9</sup> Except for currently licence areas of 4-170, 4-171, and 4-172 that could remain Tier 4 following transition and renewal



equipment vendors a couple of years to develop radios that leverage the latest TDD technologies for certification and commercial delivery that is compatible with the needs of the BRS licensees. Shortly afterward, ISED must revise SRSP-517 to facilitate coexistence of post-transitioned TDD operations between BRS licensees (and other services) to clarify final operational rules for network design that may differ from transitional operational measures.

- c. **Reassignment of licences from FDD to TDD:** The framework needs to require all current BRS holdings to be reassigned as contiguous TDD blocks of an equivalent quantity. Any updates to the policy and licensing framework for the band must facilitate the assignment of post-transition frequencies and determined through an industry-led process. This framework must also ensure interference free TDD operations following an industry determined transition date per area. ISED can support this process by issuing interim overlay licences to support TDD operations during transition (i.e., prior to the expiry of primary FDD licences and before renewal under a new band plan, according to frequency assignments determined as the output of an industry-led process.)
- d. **Definition of a licence renewal process following a transition decision:** It is critical that ISED provides a decision on renewal criteria affecting existing licences which acknowledge that spectrum has been put to use either before or after transition. Please refer to TELUS' response to Question 3.

36. These preconditions are essential to provide regulatory certainty, thereby enabling operators to make informed capital investment decisions and allowing equipment vendors to develop products aligned with the final technical and regulatory framework.

***An industry-led approach for transition timelines***

37. International precedents for a transition of this magnitude in markets of comparable scale and infrastructure maturity, including the United States, remain exceedingly rare. While Germany and the United Kingdom have implemented localized variations of FDD-to-TDD rebanding, these examples lack the structural and operational parallels required to serve as a direct template for the Canadian environment.
38. Jurisdictions such as Qatar have mandated<sup>10</sup> a transition from FDD to TDD in the 2.6 GHz band; however, their seven-month implementation window is ill-suited for the Canadian environment. Canada's market is significantly more mature, supporting millions more subscribers on heavily utilised networks. Unlike the Qatari model, a Canadian transition requires a long-term 'glide path'.
39. TELUS appreciates ISSED's recognition that the transition to an unpaired TDD-use band plan is complex and must accommodate operators' differing capital investment cycles. Many licensees have already procured and deployed FDD equipment. TELUS has recently deployed FDD equipment to new regions, and TELUS anticipates continued investment in FDD equipment leading up to a TDD transition decision in order to sustain and grow network capacity given that Band 7 is a workhorse band for 5G. These series of

---

<sup>10</sup> *CRA Issues Decision to Mobile Service Providers to Enhance Consumers' Experience*, published September 2024. Link: <https://www.cra.gov.qa/en/press-releases/cra-issues-decision-to-mobile-service-providers-to-enhance-consumers-experience>

investments, for all MNOs, represent significant capital outlays in the order of hundreds of millions of dollars that require recouping via several years of useful operation for our customers. Investing in new TDD radios will take large amounts of capital and time, thus the need for multiple regions over a series of transition timelines for each region to make it manageable for all operators.

40. TELUS is a founding member of an industry-led stakeholders approach and continues to support a principled approach that contemplates the completion of BRS transition at staggered dates across three distinct regions. In the latest stakeholder discussions, these dates were proposed at 2033, 2035 and 2036, with the vast majority of the country transitioning by May 2035<sup>11</sup>. Beyond each notional cut-over date, FDD operation would no longer be permitted in that region, enabling BRS licensees with TDD radio deployments to operate unconstrained by FDD interference.
41. Only Cogeco advocates for earlier transition dates between 2028 and 2031 predicated on the status quo regulatory environment for existing radios and deployment requirements. Cogeco is amenable to the alternative target transition dates above based upon two conditions, a) *“ISED should allow for the early utilization of Band 41-capable radio equipment, provided that any potential interference with legacy Band 7 operations is resolved through inter-carrier coordination”*, and b) *“...relax the 2028 deployment obligations for Band 7 and Band 38.”*. These two conditions are satisfied in TELUS’ proposal (and the proposals of all other transition proponents) such that Cogeco can support the stakeholders target transition dates and work within an industry-led transition

---

<sup>11</sup> ON, QC excl Gaspé peninsula (May 2033); NB, NS, PE, NL, BC, AB, SK, MB incl Gaspé peninsula (May 2035); YT, NT, NU (May 2036)

with coordination. TELUS supports any early use of band-41 capable radio provided that such operations can coexist with band 7 (FDD) deployments on a no-interference no-protection basis.

42. TELUS opposes proposals by a couple of operators (e.g., Eastlink) to arbitrarily extend the transition timelines to TDD by as much as five years to as late as 2040. Ecotel does not define their sub-regions exactly, but parts of Ontario and Quebec are potentially delayed four years to 2037 and parts of “*Northern Prairies*” delayed by three years to 2038 relative to the target transition dates. Without detailed knowledge of Ecotel’s operations in many of the delayed areas such as “...*Lower Prairies (incl. Edmonton, Saskatoon and Winnipeg) & remaining of BC...*” where there is no apparent licensing, it would be difficult for any one stakeholder to discuss their ‘*inter-carrier coordination*’ requirement.
43. A transition timeline of 2033 to 2036 already provides nearly a decade of advance notice from this Consultation, affording all operators what should be ample time to depreciate existing assets, scope replacement costs, and service upgrades well within a series of capital planning cycles. Prolonging the transition would needlessly extend the period of spectrum fragmentation, compel operators to maintain complex and costly mixed FDD/TDD network environments, and ultimately delay the delivery of more advanced 5G and 6G services to Canadians.
44. This industry-led three phase transition permits staggered equipment deployment, spreading the capital investment across multiple years and allows operators to align spectrum modernization with largely unaccelerated network refresh cycles (and relatively

small cost impacts). The industry knows best the reality on the ground and must retain flexibility to optimally manage the transition timeline in a manner that both minimizes service disruption and maximizes connectivity for Canadians.

45. TELUS reminds ISED that the industry is best positioned to develop and manage the detailed transition plan, as recognized by ISED in the Consultation. The complexity of accommodating existing FDD deployments, managing spectrum contiguity for legacy operators and coordinating the phased transition across the three geographic regions requires detailed operational knowledge and flexibility that only industry participants collectively possess.
46. This collaborative approach allows industry to manage the detailed logistics of the transition while ISED provides the regulatory foundation necessary to ensure the transition serves the interest of all Canadians.

***Issuing interim overlay TDD licences while FDD licences are still in effect***

47. Industry will require ISED to address the significant regulatory transition complication caused by the heterogeneous nature of existing 2500 MHz licence characteristics. Currently the band is a patchwork of licences with disparate expiry dates, staggered mid-term assessment dates, and vastly different licence fees obligations; including auctioned licences with no fees and legacy transitioned licences subject to annual fees that are operator and fee tier specific. These differences create a ‘valuation gap’ between licensees that complicates the TDD transition through licence exchanges under the

spectrum transfer framework<sup>12</sup>. Transferring entire licences with different attributes (expiry dates, deployment requirements, etc.) is commercially untenable.

48. ISED could enable a new framework for licence novation<sup>13</sup> to address the disparity in licence attributes to address the disparity in licence attributes. Under this approach, operators would swap their assigned frequency blocks while the original expiry date, fee structure, and specific conditions remain with the original holder. This streamlined process would ensure that the regulatory attributes of a licence remain unmodified, providing long-term investment certainty while allowing frequency swaps to create contiguous TDD assignments.
49. As an alternative, ISED could apply an approach similar to that which has been implemented to support the current mitigation strategies in border areas. ISED could issue interim overlay licences (i.e., instead of a special authorization by SAB-01-26<sup>14</sup> licence as a temporary measure) to authorize operations in post-transition spectrum assignments, whilst licensees continue to hold their primary licences. Upon expiry of primary licences (simultaneously with the interim overlay licences), the pre-transition assignments would cease and licences would be issued for a new renewal term according to interim overlay spectrum licence assignments only, while adopting the condition of licences of a yet-to-be-determined renewal policy for the existing licences. This licensing

---

<sup>12</sup> CPC-2-1-23, *Licensing Procedure for Spectrum Licences for Terrestrial Services*, Issue 7, published November 2024. Link: <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/procedures/client-procedures-circulars-cpc/cpc-2-1-23-licensing-procedure-spectrum-licences-terrestrial-services>

<sup>13</sup> The substitution of a new obligation or contract (e.g. licence) for an old one by the mutual agreement of all parties concerned.

<sup>14</sup> SAB-01-26 - *Authorization for the Use of Certain Frequency Blocks in the 2500 MHz Band along the Canada/U.S. Border*, published January 2026. Link: <https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/learn-more/key-documents/spectrum-advisory-bulletins-sab/sab-01-26-authorization-use-certain-frequency-blocks-2500-mhz-band-along-canadaus-border>

mechanism and approach would remove the aforementioned ‘valuation gaps’ that would result from licence swaps using the spectrum transfer framework.

50. To address the complications of mismatched licence attributes during the transition to a TDD band plan, TELUS recommends ISED assign interim overlay licences according to new TDD assignments as a bridge to enable both transition and renewal. TELUS proposes a mechanism for determining new TDD assignments in its response to Question 4(c) below.

### Q3: Deployment requirements

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

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

51. The transition from a combined FDD/TDD band plan to a TDD only (n41) band plan necessitates the replacement of legacy FDD radios with TDD capable equipment. To accommodate the significant technical complexity and the high capital costs associated with a full-scale radio replacement across existing networks, ISED is correct to consider whether deployment requirements should be adjusted. In particular, TELUS recommends ISED focus on *when* to assess the requirements.
52. TELUS agrees with ISED that all regulatory assessments should be paused until a decision is reached on the rebanding of 2500-2690 MHz. There will be several phases of transition where FDD and TDD deployments will exist in different transition regions. This begins with the first Band 41 radio deployment in a multi-year replacement program in region one and ends with the final FDD-to-TDD transition cut-over of region three.
53. Deployment requirements are intended to ensure spectrum is used for the benefit of Canadians. However, enforcing any build requirements during transition (e.g., prior to the 2025 delayed assessment or potentially a delayed 2028 assessments) is counterproductive. Pausing the deployment assessment until post transition recognizes the transient nature of the deployment state at any point in time of the transition period.



54. Many other respondents<sup>15</sup> also ask for a pause in assessing deployment requirements, with several<sup>16</sup> seeking to make the pause permanent or extended to 5 years after the transition dates. Given the stakeholder transition target dates of 2033, 2035, and 2036, a permanent pause or a 5 year extension (from a transition date) of the assessments is problematic when considering the implicit requirement of renewal without meeting any deployment requirements. In the same vein, any request to pause deployment requirements without addressing licence renewal would be bad policy that weakens ISSED's objective of putting spectrum to use in a reasonable timeframe while introducing licensing uncertainty at the extended term end. More importantly, with millions of investments in future TDD radio culminating near the eve of a 2035 renewal date, licensees should be addressing regulatory certainty of reasonable renewal criteria ahead of transition. TELUS' recommendation below addresses early renewal certainty leveraging already deployed capital equipment and makes available early assessment (e.g., the 2025 milestone) at the licensees' own choosing to lend flexibility down the road where they can subsequently invest in new TDD radios at their own pace having secured renewal.
55. ISSED should only assess deployment requirements for licences considered for renewal, which typically occurs in the final year of a licence term. TELUS notes that FDD radios in Band 7 have been extensively deployed nationally, providing critical mid-band capacity depth necessary to support the growing data demands of Canadians.

---

<sup>15</sup> Bell, Cogeco, Eastlink, Ecotel, Rogers, SaskTel, and Vidéotron all support a pause in assessing deployment requirements in their comments to the Consultation

<sup>16</sup> Bell, Cogeco, Rogers, and Vidéotron support a further 5-year grace period after a transition date before assessing deployment requirements

Furthermore, as a result of significant investments in deploying Band 7 across our network, TELUS has met and continues to meet the 10-year deployment conditions. Moreover, the importance of this band for 5G capacity is such that TELUS plans to continue adding Band 7 radios despite the foreseen transition as a result of this Consultation. It is only reasonable for ISED to recognize any investments by the industry when assessing licences for eligibility of renewal.

56. Eastlink<sup>17</sup>, Rogers<sup>18</sup>, and Xplore<sup>19</sup> have indicated compliance with the deployment requirement under their current deployment (i.e., the 2025 and 2028 milestones). It is therefore reasonable to presume all other licensees have therefore at least met (or could meet) their 2025 deployment obligations, leaving only licences with the 2028 build obligations and a future renewal assessment before the 2035 and 2038 expiry date. In TELUS' proposal below, the licences expiring in 2035 would presumably prequalify for renewal, thus narrowing the scope of concern to licences expiring in 2038. In keeping with respondents seeking delayed assessment, ISED should also not mandate a 2028 assessment to avoid triggering short-lived FDD investment in TELUS' proposal.
57. For those licensees that have not confirmed full compliance with their balance of licences and wish to delay a 2028 assessment, these licensees would only need to ensure deployment requirements<sup>20</sup> are met 3-years after the relevant 2035 transition date and for a minority of licences. TELUS counts at most 35 of the 564 licences that may be transitioning leading to the 2038 renewal date held by Cogeco, Ecotel, and Vidéotron.

---

<sup>17</sup> Paragraph 17 and 59, Rogers' comments to the Consultation

<sup>18</sup> Part 'c)' of page 4, Eastlink's comments to the Consultation

<sup>19</sup> Paragraph 32, Xplore's comments to the Consultation

<sup>20</sup> Ecotel has one Yukon licence that may transition in 2036 with a June 2038 licence expiry date and 2038 preferred transition date

Three licences are addressed by SAB-01-26 where deployment requirements are relaxed (i.e., Victoria, Niagara-St. Catharines, and Kingston FDD licences). Two licences are adjacent blocks that could be deployed as one carrier (i.e., H1 block with H2 block). Under TELUS' proposal, the handful of 30 of the 564 licences may be at risk of insufficient deployment due to the timing of a short transition period before renewal in 2038. Leveraging a single assessment for renewal in 2038 offers an ample five to three years under the stakeholders target transition date of 2033 and 2035<sup>21</sup> to build out for renewal.

58. TELUS considers that ISED should also allow for licensees to be assessed at any time up to and including the end of the licence term. Rather than following the typical process of consulting on licence renewal in the year prior to licence expiry, TELUS recommends ISED consult and publish an early renewal policy decision that focuses only on establishing deployment requirements as a necessary condition to be eligible for a renewed licence term. This approach provides licensees with a flexible pathway to demonstrate renewal eligibility while maintaining regulatory clarity.
59. Given that there are only mid-term requirements (e.g., 10-year for auctioned licences; 4-year and 14-year for renewed licences) for the first wave of licences expiring in 2035, TELUS recommends that ISED assess the state of deployment as originally set in the conditions of licence and if the minimum coverage requirement was met, licensees prequalify for a renewed term. In other words, licensees that have already met, or would meet their upcoming, mid-term deployment requirements using FDD should receive

---

<sup>21</sup> The one Yukon licence held by Ecotel would potentially transition in 2036

confirmation of their eligibility for renewal licences in a subsequent term under the new band plan. The confirmation of renewal eligibility should stand regardless of their state of TDD deployment at the end of their current licence term. Such an approach would provide the sufficient and necessary regulatory certainty for operators to commit significant investment in new TDD infrastructure. This is appropriate to acknowledge the benefit that has been delivered to Canadians already (having put spectrum to good use and continues being put to good use with TDD) while avoiding the uncertainty of the assessment criteria near the term expiry and whether the resulting TDD replacement coverage is sufficient.

60. TELUS' proposal removes all 2035 (i.e., licensees that met their 2025 requirements) and much of the 2038 renewal risk to the majority of licensees created by a transition decision. TELUS' proposal allows for licensees to transition at the stakeholders' target dates while having peace of mind that their existing network deployment grants them early renewal certainty. Thereafter, any stakeholder with small licensing gaps would have the flexibility to deploy, leading to and following transition, at a pace no different from their capital equipment plans (but using Band 41 equipment) for a handful of licences up until 2038 for renewal.
61. In a tangential concern of the deployment requirements in Question 3, Rogers links Question 3 with the risk of insufficient deployment along the U.S. border regions where interference may impair deployment. Under the current licensing regime and modified rules governed under SAB-01-26, ISED has already made clear that assessment would be

relaxed<sup>22</sup> to encompass “...any deployment...” as sufficient licence compliance. With deployment in any one FDD block satisfying the condition of licence for deployment, the risk of insufficient deployment due to cross-border interference is unrelated to a transition decision. TELUS’ renewal proposal fits well with SAB-01-26 by providing regulatory certainty in many populated service areas along the border.

62. ISED needs to establish a renewal policy well in advance of any transition activities. TELUS’ proposal is to use the existing mid-term requirements for ISED’s renewal assessment to provide regulatory licensing certainty, while allowing licensees to decide an assessment date between a transition decision (to leverage existing deployment) to the licence renewal dates. Underpinned by everyone’s commitment to transition, these planned investments then secure larger contiguous spectrum assets with more valuable technical and market capabilities which ultimately benefit Canadians.

---

<sup>22</sup> “If the frequency block covered by a new authorization is encumbered by a U.S. operator, any deployment of spectrum by the authorized party to offer commercial mobile or fixed wireless service in the same service area represents full compliance with the deployment requirements of the authorized party’s existing licence in that area.”, SAB-01-26, January 2026

#### Q4: Preliminary considerations for a transition plan

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

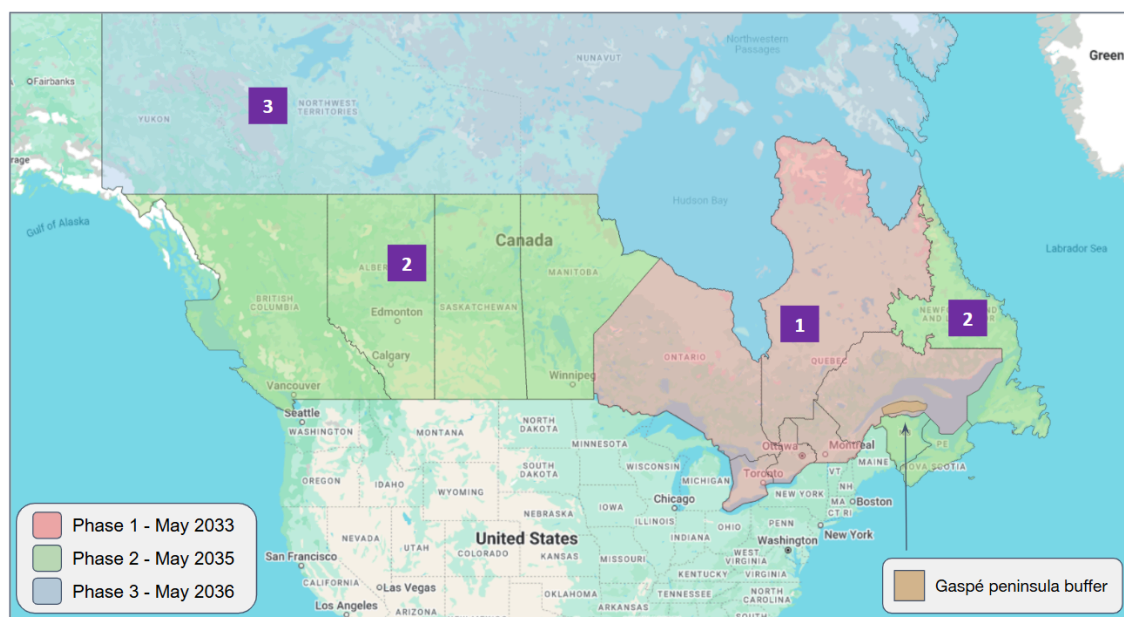
- a. should the transition strategy be implemented on a market-by-market basis across Canada? If so, which regions should be prioritized and how should the timelines be staggered?
- b. should certain portions of the band, such as the Canadian FDD uplink spectrum, be prioritized first during the transition?
- 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 to the above questions, respondents are asked to include supporting rationale and arguments.

##### ***(a) Industry defined transition zones***

63. TELUS is adamant that allowing industry to negotiate transition areas and define transition timelines is a fundamental requirement for the successful implementation of a BRS TDD band transition.
64. Today, BRS FDD serves as a capacity workhorse for TELUS' network, providing the critical mid-band depth necessary to support the growing data demands of Canadians nationally. Given its key role for high capacity LTE and 5G services, any transition must be managed with careful consideration to avoid service degradation. A rigid, regulatory defined area and/or timing may not account for the operational realities of maintaining the much needed capacity that BRS FDD offers, while simultaneously overhauling the underlying band.

65. As ISED is aware, all BRS licensees nationally have been actively engaged in an industry process since mid-2024 and working collaboratively on a plan for a TDD transition. Licensees have collectively discussed a joint proposal for spectrum transition from FDD to TDD for the 2500 MHz band. The joint proposal identified the primary requirements of maintaining continuous service throughout the transition period while minimizing implementation complexity.
66. From a geographic and service area perspective, stakeholders discussed transitioning regions of Canada in a staggered manner to balance the scope of transition with the risk of harmful interference from introducing additional borders for TDD-FDD coexistence. The resulting proposal accomplishes this largely by selecting large regions separated by areas of relatively low population density (and accordingly, low deployment density) and geographic features. Figure 1 shows the proposed delineation of transition areas<sup>23</sup>.



**Fig 1: Industry stakeholder preferred delineation of transition zones with tentative dates**

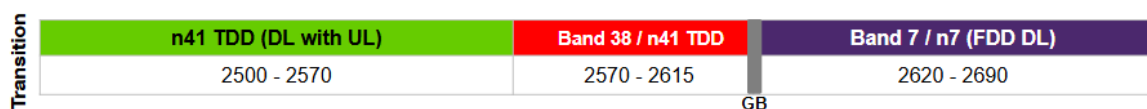
<sup>23</sup> ON, QC excl Gaspé peninsula (May 2033); NB, NS, PE, NL, BC, AB, SK, MB incl Gaspé peninsula (May 2035); YT, NT, NU (May 2036)

67. The breakdown in transition regions is designed to incorporate the fewest number of transition areas by aligning them with natural geographic barriers and Tier 2 service areas. The exception to this is the Gaspé peninsula which was preferred to transition at the same time as the maritime provinces of New Brunswick, Nova Scotia, Newfoundland & Labrador and PEI.

***(b) No prioritization of any portion of band***

68. TELUS recommends that ISED defer the specifics of transition sequencing and band prioritization to industry-led agreements. A ‘top-down’ prioritization of certain spectrum portions risks creating technical bottlenecks and increasing implementation complexity. Instead, the transition should be viewed through the lens of network reliability, where the timing is dictated by the industry’s ability to maintain service continuity when transitioning from FDD to TDD operations.

69. BRS licensees have analysed various potential solutions to ensure coexistence throughout transition. Initially, a technical solution was identified whereby the uplink (UL) portion of the band 7 would be turned off during the transition period, thus making room for a potential n41 operation in the UL portion, as illustrated in Figure 2.



**Fig 2: Preliminary proposal for simultaneous TDD + FDD DL coexistence during transition**

Under this approach, the TDD portion (Band 38) would also be protected from any interference originating from Band 7 operation.



70. Subsequent analysis of the UL capacity needs for multiple MNOs revealed that a long period with reduced UL would cause significant UL capacity challenges. As a result, the current industry view has evolved to continue using the UL in the 2500 - 2570 MHz portion, which would thus negate the possibility of a series of partial band transitions over phases in time. This has instead been replaced with a “cut-over” to TDD at specific coordinated transition dates. Downlink-only operation of TDD radios in the Band 7 downlink (DL) portion of the band is still possible, although it is not likely that anyone would operate n41 radios in the DL only portion before the effective transition date (e.g., not before May 2033).
71. TELUS does not recommend certain portions of the BRS FDD band be prioritised over others when transitioning. The technical consensus among stakeholders suggests that a staggered geographic migration is far more effective than a frequency-first approach. By focusing on regional transitions that utilize geographic features to insulate potential interference, operators can ensure that the move to TDD does not compromise network performance. A holistic, region-by-region transition allows for a more controlled environment where harmful interference is minimized and the integrity of the 2500 MHz band is preserved for users.

***(c) Contiguity of blocks***

72. Whilst technical standards will usually mitigate against some of the inefficiencies inherent in disparate block assignments – most pronounced in FDD duplex pairing scenarios – few benefits outweigh a network having contiguous spectrum.

73. TELUS strongly supports the creation of large contiguous spectrum allocations as a fundamental outcome of the transition to a BRS TDD band plan. Combining all former portions of each licensee's blocks (DL and UL) into contiguous blocks of spectrum will significantly enhance the efficiency and performance of future networks. 5G and future 6G standards are optimized for wide-channel bandwidths because contiguous spectrum is more spectrally efficient which directly translates to higher peak data rates and increased overall network capacity. Establishing contiguous BRS TDD blocks ensures that these important mid-band holdings are future-proofed.
74. Following a decision to transition to a TDD band plan, licences should be rearranged such that all existing FDD and TDD licences for a given licensee should be brought together to create contiguous TDD blocks. Ensuring spectrum holdings for every licensee are self-contiguous within the new band plan is not merely a preference; it is a technical necessity to maximize the usability of the 2500 MHz band and ensure that Canadian consumers benefit from the full potential of 5G and 6G technology.
75. Consequently, TELUS objects to proposals seeking a bespoke multi-year "protection period" for incumbent Band 38 operators following the regional transition cut-over dates. Permitting certain operators to hold fragmented legacy spectrum for an additional five years post-transition directly contradicts the primary technical objective of the rebanding process. Unless agreed by negotiation (and only by negotiation) amongst impacted licensees, such holdovers would effectively block the broader industry from executing the necessary frequency exchanges required to assemble the wider contiguous blocks that 5G and 6G networks require. To ensure the immediate realization of spectral efficiency gains

and prevent sustained disruption, the reassignment of all frequencies into contiguous holdings must be instantiated at the regional transition cut-over date.

76. To ensure the optimal allocation of all available spectrum within a new TDD band plan proposed in Question 1, TELUS recommends ISED auction the currently restricted 5 MHz guard bands paired contiguously together (2570-2575 MHz and 2615-2620 MHz) as one 10 MHz generic product block. Under the old band plan, these segments were unusable because of the need to protect FDD operations. Releasing available spectrum to the market through an auction will provide operators with now usable spectrum and made contiguous with existing spectrum holdings following the frequency assignment process.
77. Rogers proposes<sup>24</sup> an auction of “unassigned TDD spectrum held by ISED, as well as any current assigned spectrum within the two 5 MHz restricted bands, 2570-2575 MHz and 2615-2620 MHz.”. Rogers does not fully explain why it suggests existing assignments of restricted block spectrum must be returned. However, TELUS notes that 3GPP standards for 5G do not fully support all channel bandwidths at 5 MHz granularity for 5G Band n41. Only 5, 15, 25, 35 and 45 MHz channel bandwidths are supported; in contrast, channel bandwidths in all multiples of 10 MHz are supported (up to 100 MHz). This feature, along with the ability to maintain a simplified band plan with 10 MHz blocks and a less complex assignment auction, together form a strong basis for finding a path to resolving the challenges posed by existing 5 MHz assignments.

---

<sup>24</sup> Paragraphs 24-31, Rogers’ comments to the Consultation

78. TELUS posits several notional ways in which the desirable outcome of having all licensees hold 10 MHz blocks could be achieved (each with its own pros and cons), including:
- a. Requiring the return of all licensed spectrum in the 5 MHz restricted blocks (i.e., Rogers' proposal); or
  - b. Granting the additional 5 MHz of 'restricted block' spectrum to existing licensees in markets where they currently hold a single 5 MHz restricted block; or
  - c. Allowing licensees an equivalent exchange of their restricted block spectrum (on a MHz-pop basis). Licensees could return 5 MHz of restricted block spectrum in half of its licences (by MHz-pops) and in turn, receive the complementary 5 MHz of restricted block spectrum in other portions.
79. Given that this important topic was not addressed in this Consultation, TELUS recommends ISED consult shortly after issuing a decision on the transition on a policy and framework for the guard bands and their subsequent auction, including the notional options listed above.
80. Once this necessary step of auctioning off unassigned and desired BRS spectrum (through some form of ISED-enabled grant/return process and the auction of remaining unassigned blocks), repacking the band into contiguous blocks should follow through an industry-led assignment process, not an ISED auction. Instead of ISED running a reassignment auction and retaining the proceeds, operators should organize this process themselves. An industry-led assignment auction allows stakeholders to resolve competing requests by submitting their preferred locations in the band, while integrating any newly

auctioned “guard band” spectrum. An industry-led auction would be run by a trusted independent consultant and “winners” would pay “losers”. Operators not winning their desired frequency assignments would receive funding from the operator(s) who outbid them for that assignment (namely second price bids). This approach is the most pragmatic way to finalize the frequency assignments with only the minimally necessary regulatory intervention.

81. An industry-led assignment auction involves the benefit of winners’ payments being used to help recoup the industry's transition costs. TELUS particularly recognises the financial obstacle of transition expressed by smaller operators as the need for additional transition time<sup>25</sup> (and expressed ostensibly in contrast to the stakeholders 2033, 2035, and 2036 target dates) or the need to continue Band 38 TDD operations<sup>26</sup> for five more years after the stakeholders’ target dates. Distributing re-assignment proceeds in this way ensures that modernizing the 2500 MHz band does not slow down the expansion of wireless connectivity in Canada's rural communities.
82. If in advance of an industry-led re-assignment process, industry determines that re-assignment can be resolved directly through negotiations, industry could forego this auction.

***(d) Geographic aspects of transition***

83. As discussed in TELUS’ response to sub-question (a) above, industry stakeholder discussions have identified three large transition geographies which involve groups of Tier 3 areas selected in such a way as to ensure minimal interference between the regions.

---

<sup>25</sup> Paragraph 17, Ecotel comments to the Consultation; paragraph 27, Xplore’s comments to the Consultation

<sup>26</sup> Paragraph 9, Xplore’s comments to the Consultation

84. Given the key feature of this design is to minimize service disruption (i.e., to maintain FDD service in all un-transitioned geographic areas until a cut-over to TDD), TELUS does not foresee any specific need to adjust deployment requirements to accommodate the geographic aspects of transition. However, as discussed in TELUS' response to Question 3, ISED should relax the assessment timeline for deployment and importantly must establish renewal eligibility criteria well in advance.

*(e) Technical considerations*

85. Equipment vendors have indicated a minimum lead time of two years to develop, test, and certify new radios in advance of any deployment. As such, TELUS requests that ISED begin the process of updating 2500 MHz standards (RSS-199/SRSP-517) with a goal that the technical standards be completed at least two years prior to commencement of the transition. This will enable operators to effectively plan collaboration with infrastructure vendors on new radio designs and to schedule network deployments. Furthermore, we propose that ISED consult through a RABC process, taking input from industry stakeholders to develop the RSS and SRSP. Such a process should ensure the standards reflect contemporary technological capabilities and operational requirements.
86. TELUS notes that an updated version of SRSP-517 need not prescribe technical coexistence measures that would apply during transition. Unlike in the 3500 MHz and 3800 MHz transition processes (which necessitated "Transition Manuals" to define clear measures for the treatment of incumbent services), such measures in the 2500 MHz transition can and should solely be defined through mutual agreement between licensees.

***(f) Additional considerations***

87. TELUS has no further reply comments at this time regarding any other key elements not already addressed in its response above.

\* \* \* \* \*

End of document