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Dear Mr. Hill:

Subject: Canada Gazette, Part I, June 12, 2010, Notice No. DGSO-001-10: Decisions on the Transition to Broadband Radio Service (BRS) in the Band 2500-2690 MHz and Consultation on Changes Related to the Band Plan

TELUS Communications Company (TELUS) is pleased to respond to Canada Gazette, Part I, June 12, 2010, Notice No. DGSO-001-10: Decisions on the Transition to Broadband Radio Service (BRS) in the Band 2500-2690 MHz and Consultation on Changes Related to the Band Plan (the Consultation).

TELUS has undertaken a review of the Decision and Consultation Document. In Part A of the Document, we note the various decisions of the Department in relation to MDS and MCS and the transition to BRS services.

Our comments below deal with Part B of the Consultation Document.

Summary Response to Part B of the Consultation Document

In summary:

1. TELUS does not support harmonization with the U.S. Band plan, presented as Option 1.

2. TELUS recommends that the spectrum blocks be aligned with the International band plan as proposed in Option 2.
3. TELUS does not support the proposed 21% increase in retained incumbent FDD spectrum (from 33MHz to 40MHz as noted under Option 2 in Section 8.2). This comes at the expense of band entrants and is not in keeping with the in-force policy in the band.
4. TELUS does not believe that the operation of TDD systems should be allowed in the FDD portion of the band plan, except for the duration of the incumbents' transition period.
5. TELUS does not believe that guard bands should be held in reserve by the Department. Rather, the guard band portions of the band plan should be assigned to TDD operators along with the obligation to avoid interference to FDD systems (and any other TDD systems). Further, we are of the opinion that the use of the guard bands by licence-exempt systems should be avoided.
6. TELUS agrees that the band plan should emphasize the maximization of paired spectrum. In general, TELUS agrees with pro-active re-assigning of spectrum blocks to facilitate deployments aligned with the international band plan. We are agnostic where two operators are involved but strongly recommend pro-active re-assigning everywhere where the Department holds unassigned MDS spectrum.

Response to Part B – Consultation on Band Plan

Our responses below adopt the same section numbering scheme as used in the Department's Document.

Section 8. The Frequency Band Plan

As indicated in the TELUS Response to DGRB-005-09, TELUS supports the international band plan.

Section 8.1 Option 1 – Harmonize with the U.S. band plan

This option loses any chance for harmonization in the international arena. Unless exactly the same technology as the U.S. is deployed, there will still be no roaming opportunities to the U.S. and no economies of scale with the global market. Furthermore, in trying to harmonize with the U.S. band plan today, the risk is that Canadian operators might be isolated in the future, if the

U.S. operator with the majority of licences decides to change to some other technology or duplex arrangements. In addition, with Option 1, even using the same TDD duplex mode will incur the need for guard bands at the U.S./Canada border due to the potentially non-synchronized use of that mode. Further, for technologies (using either the FDD or TDD duplex mode) which are multiples of 5 MHz in bandwidth, the U.S. band plan may provide an inefficient spectral utilization.

We note that the majority of incumbents (“[Stakeholder Proposal Development](#)”) prefer to use a FDD arrangement, so limited U.S. harmonization would occur by incumbents.

In light of the above, TELUS does not support harmonization with the U.S. Band plan, presented as Option 1 in DGSO-001-10. We strongly believe that Option 1 should not be further considered by the Department because it simply cannot provide the economies of scale rendered possible by the proposed harmonization with the international band plan, presented as Option 2 in DGSO-001-10.

Section 8.2 Option 2 – Harmonize with the international band plan

TELUS agrees that this band plan is aligned with the international Arrangement C1 from [Recommendation ITU-R M.1036-3](#), [CITEL Recommendation PCC.II/REC.8\(IV-04\)](#) and [CEPT Decision ECC/DEC/\(05\)05](#). TELUS believes Option 2 is aligned with 3GPP E-UTRA Band 7 (for FDD) and Band 38 (for TDD).

TELUS notes that base and user equipment compliant with Option 2 is available today from several vendors, which will provide immediate economies of scale without any requirement for Canadian customization and will immediately support international roaming.

TELUS agrees with the Department’s view regarding the advantages of using this option as identified in the consultation paper:

“Implementing the Option 2 model of the band plan would offer a number of advantages:

- *allow the deployment of both FDD and TDD systems;*
- *promote spectrum efficiency because guard bands, which are mostly unusable spectrum, would not be required between operators in adjacent FDD frequency blocks;*
- *permit global harmonization which would enable economies of scale for equipment and international roaming;*
- *facilitate equipment compatibility with other mobile bands licensed in Canada on a paired basis; and*
- *access a wider range of services and applications which would be developed on a global basis.”*

TELUS further notes the support for this band plan for this spectrum band by the GSM Association:

“In a comparable manner to the United States, Canada embarked on the process of transitioning the 2.6 GHz band from its current licenses and licensees to BRS (Broadband Radio Service), with a target date for the transition of March 31st, 2011. Like the United States arrangement, the current plan is inconsistent with ITU Option 1 and may lead to interference and roaming challenges. However, an October 2009 report, “Stakeholder Proposal Development: Incumbents’ Views on the 2500-2690 MHz Band Plan for Broadband Radio Service” clearly shows strong support from incumbent operators for ITU Option 1. The report highlights several key advantages consistent with benefits discussed earlier:

- Global harmonization, supporting equipment availability
- Spectral efficiency
- Accommodates both FDD and TDD operations

The favorable feedback may move Canada toward adoption of ITU Option 1. The country should take note of not only incumbent commentary, but also considerations based on the emerging global technology and market environments which were not factors in the outcome for the 2.6 GHz band in the United States. So long as the need to avoid cross border interference is satisfied, Canada would benefit by adopting the ITU Option 1 band plan.”¹

TELUS fully supports the Department’s proposal that the spectrum blocks be aligned with this band plan. TELUS supports the adoption of the International band plan presented as “Option 2”

¹ The 2.6 GHz Spectrum Band, Unique Opportunity to Realize Global Mobile Broadband, page 36, prepared for the GSM Association by Global View Partners, December 2009.

in the Consultation with the exception of an adjustment to the returned spectrum outlined in the Consultation. The TELUS proposal, more fully aligned with the 2006 Policy than that suggested in the Consultation is outlined below.

Section 8.2 Option 2 – Adjustment to the 2006 Policy on spectrum return at conversion

TELUS does not support the 21% increase in retained incumbent FDD spectrum (from 33MHz to 40MHz as noted under Option 2 in Section 8.2). This comes at the expense of band entrants and is not in keeping with the in-force policy in the band. TELUS is puzzled as to why the Department did not seek comments on a change of this magnitude from the established policy for this band. A 21% increase in retained FDD spectrum in this band is significant given the incumbent ownership structure unique to this band.

The 2006 Policy for the Band 2500 specifies a precise form for the band transition. The 2006 Policy was developed out of a consultation process that took over two years². During this two year consultation process a major shift in band ownership occurred and in the end the 2006 Policy was issued at the same time as the Inukshuk license transfer approval to the new Bell and Rogers JV.

The 2006 policy precisely specifies the return of 50% of the FDD spectrum created via the mobile conversion and adoption of the FDD / TDD band plan.

The spectrum to be returned (50% of the FDD) was specified down to the MHz in the 2006 policy. However, the specification was based on the then-current plan to adopt the US band plan. To work within the international band plan's 5 MHz blocks (now proposed by the Department and supported by TELUS and the industry broadly), the precise specification for returned spectrum must be adjusted. TELUS believes that there are three obvious potential adjustments that could be made.

² The original mobile conversion consultation in the band 2500 took place from April 2004 through March, 2006. See Appendix B attached for the lead up to the 2006 Policy and Appendix A for the Inukshuk License Transfer Conditions.

1. A pro rata translation
2. The Department proposed translation giving incumbents 21% more FDD spectrum than the 2006 policy specifies
3. A counter proposal for translation giving incumbents 9% less FDD spectrum than the 2006 policy specifies

Below, we discuss each of them and Table 1 contains a numerical summary.

Table 1 – Disposition of spectrum in the band 2500 earmarked as FDD upon mobile conversion

Spectrum in the band 2500 earmarked as FDD upon mobile conversion	Baseline		Translation 1		Translation 2		Translation 3	
	2006 policy based on US band plan		Pro rata translation to international band plan		IC proposed translation to international band plan		Market based translation to international band plan	
	MHz	%	MHz	%	MHz	%	MHz	%
Incumbent View (FDD portion of band only)								
MCS pre return	66	100%	70	100%	70	100%	70	100%
MCS post return	33	50%	35	50%	40	57%	30	43%
MDS pre return	66	100%	70	100%	70	100%	70	100%
MDS post return	33	50%	35	50%	40	57%	30	43%
Total pre return	132	100%	140	100%	140	100%	140	100%
Total post return	66	50%	70	50%	80	57%	60	43%
Delta from 2006	0		+4		+14		-6	
Band Entrant View								
Total returned	66	50%	70	50%	60	43%	80	57%
Delta from 2006	0		+4		-6		+14	

Translation 1 – Pro Rata

A pro rata translation of the 2006 policy (i.e., taking the 2 x 33 MHz clawback to 2 x 35 MHz given the FDD in the band plan increases from 132 to 140 MHz.) is presumably the most logical and fair approach. Incumbents as a whole receive half (4 MHz) of the extra FDD spectrum (8 MHz) created by the international band plan and entrants as a whole get access to purchase half (4 MHz).

While an auction of 2 x 35 MHz for entrants is straight forward, 2 x 35 MHz is awkward to split between two incumbents as they would each retain 2 x 17.5 MHz which is not efficient for technologies based on a 5MHz blocks. However, given that one band incumbent (Inukshuk) holds roughly 90% by population of the service areas where both MCS and MDS spectrum is allocated, the pro rata approach (providing 2 x 35MHz to Inukshuk) is potentially workable. As far as TELUS can tell, the only major market where the MCS and MDS licence holders are different is in Saskatchewan and Manitoba and the North. Conceivably, the two operators in these areas could enter a commercial transaction to convert one to a 2x 20MHz licence holder and one to a 2x 15 MHz holder.

Translation 2 – Department proposed translation giving incumbents (predominantly the Rogers and Bell JV) 21% more FDD than the 2006 baseline

TELUS can see the logic of 2 x 40 MHz from the Inukshuk JV perspective (especially with respect to future divisibility).

From a band entrant perspective, this aspect of the band plan proposal comes across as shocking, especially given the DGSO-001-10 Part 1 transition decision and the recent new BRS licence grants in BC wherein the Department's generosity to "incumbents" has been plain to see.

The band is being totally re-farmed (save perhaps Manitoba). This is a new mobile band. "Incumbents" are already receiving a windfall gain on their fixed licence holdings. The Department has granted a BRS spectrum licence to Inukshuk (via its Craig Wireless acquisition)

in Victoria and Kelowna that benefits from the Department's generous decision to require only a CRTC Decision and an Industry Canada broadcasting certificate in place in order to be eligible to convert to BRS licences. . Further, the Department has further decided to convert licence areas as Tier 3 providing, in some areas, new additional territory to incumbents. On top of these generous geography-domain decisions in favour of "incumbents", to also propose for "incumbents" a generous upsizing in the frequency-domain by way of a 21% increase in the amount of FDD spectrum they retain is, in TELUS's view unreasonable.

It is unreasonable because it increases the concentration of spectrum ownership in this band. It will presumably result in increased unit pricing at auction for band entrants while also presumably decreasing total auction revenue for the government. It means that while a single operator enjoys 57% of the FDD spectrum, all band entrants will need to share 43%, so Translation 2 is an option that is less supportive of entry and less responsive to market forces than either of the other alternatives for translating the 2006 policy to the international band plan.

Translation 3 – Recommended final Department landing point on the translation decision giving incumbents 9% less FDD than the 2006 baseline

For the same reasons listed above that make increasing the incumbents retained FDD by 21% unreasonable, we submit that giving band entrants as a group the opportunity to bid on 21% more FDD at auction and reducing the incumbent's retained FDD spectrum by 9% is very reasonable and advisable.

It would be a balanced decision responsive to all parties. It is supportive of new entry and supportive of AWS entrants. It presumably will increase auction revenues for the government.

TELUS notes that the 2006 policy based on the US bandplan provided for 12 FDD blocks (of 2 x 5.5 MHz each). Incumbents were promised 6 of these - 3 for the MDS incumbent and 3 for the MCS incumbent. New HSPA and LTE technologies operate efficiently in 2 x 5 MHz blocks.

Thus, this option essentially preserves the interests of the incumbents while recognizing the proliferation of competitors since the time of the 2006 policy.

TELUS submits that our proposed Translation 3 is the best decision for the government, for the mobile industry in Canada and for consumers and businesses in Canada. We therefore strongly recommend that Industry Canada adopt Translation 3

Given the benefits of the internationally harmonized band plan, Industry Canada proposes to adopt the Option 2 model of the band plan for BRS in the band 2500-2690 MHz.

The Department seeks comments on its proposal to adopt the Option 2 model and on the following related elements:

- 1. Should operation of the TDD systems be permitted in the FDD portion of the band plan and, if so, under what conditions?*
- 2. Should the guard band blocks 2570-2575 MHz and 2615-2620 MHz be held in reserve by Industry Canada or should they form part of the unpaired block (TDD)?*
- 3. If the guard bands are to be held in reserve, should they be considered for future use by licence-exempt wireless systems?*

Please provide comments on any additional technical details related to the band plan which are not addressed above.

Q1: Should operation of the TDD systems be permitted in the FDD portion of the band plan and, if so, under what conditions?

If TDD systems are permitted in the FDD portion of the band, interference is very likely to happen not only with base stations but with terminals as well. TDD systems operating in the FDD portion of the band plan would generate interference to:

- FDD systems operating in the same geographical area in the adjacent FDD blocks;
- FDD systems operating in the same frequency block, or in a frequency block overlapping with the block of the TDD system, and in an adjacent geographical area.

This situation will especially affect global roaming of portable / mobile equipment and would result in losing most of the benefits of adopting the international band plan.

TELUS does not believe that the operation of TDD systems should be allowed in the FDD portion of the band plan, except for the duration of the incumbents' transition period, which would only last until the implementation of the new band plan is completed.

For further clarity, TELUS is of the opinion that in a scenario where an incumbent would need to operate TDD systems in the FDD portion of the band plan for an extended period of time, the incumbent would need to provide the necessary guard bands to avoid interference.

Q2: Should the guard band blocks 2570-2575 MHz and 2615-2620 MHz be held in reserve by Industry Canada or should they form part of the unpaired block (TDD)?

TELUS believes that the guard band portions of the band plan should be assigned to TDD operators. As long as TDD operation does not inhibit FDD applications within the FDD portion of the band, then TDD systems should be permitted to operate within the guard band. Evolution of technology may allow improved radio isolation or commercial deployment of low power indoor solutions to maximize utilization of the TDD spectrum.

Q3. If the guard bands are to be held in reserve, should they be considered for future use by licence-exempt wireless systems?

As indicated above, TELUS does not believe that guard bands should be held in reserve by the Department. Furthermore, TELUS believes that the Department should find spectrum to support license exempt uses that is not in the middle of a 190 MHz swath of commercial spectrum.

TELUS notes that licence-exempt wireless systems, by their very nature, preclude the efficient assignment of guard bands, as such systems are very difficult to keep track of, monitor and, ultimately, efficiently regulate.

Taking into account that these limits do not guarantee that aggregate interference to licensed systems will not occur, we are of the opinion that the use of the guard bands by licence-exempt systems should be avoided.

9.0 Mapping of Incumbents into Option 2 Band Plan

TELUS agrees that the band plan should emphasize the maximization of paired spectrum. In general, TELUS agrees with pro-active re-assigning of spectrum blocks to facilitate deployments aligned with the international band plan. We are agnostic where two operators are involved but strongly recommend pro-active re-assigning anywhere where the Department holds unassigned MDS spectrum.

9.1 Regions where the Department holds the MDS spectrum

The Department proposes to mandate the exchange of 20 MHz of the MDS spectrum held by Industry Canada for 20 MHz of the MCS spectrum licensed to the MCS incumbent as indicated in Figure 5.

Industry Canada seeks comments on this proposal.

TELUS agrees that the band plan should emphasize the maximization of paired spectrum and therefore strongly supports the proposal to mandate an exchange of Incumbent and Department spectrum.

The mandated exchange of Incumbent and Department spectrum is essential to a fair, consistent and logical auction that will maximize government auction revenue. This is because the auction of unpaired spectrum in the FDD portion of the band (as would be the case if there was no mandated exchange of Incumbent and Department spectrum) would have asymmetrical value to auction participants. Incumbents holding MCS spectrum in areas where the Department holds MDS spectrum (in most, if not all cases, Inukshuk) would seek the matching pair at auction but would likely get it at a discount as other bidders would have limited interest in unpaired spectrum in the FDD portion of the band. Band entrants could bid on unpaired spectrum in the FDD portion of the band with an eye to negotiating a post auction exchange (free or otherwise) with the MCS incumbent (in most, if not all cases, Inukshuk) but this would be a distant second choice to bidding on paired spectrum at auction. The mandated exchange of Incumbent and

Department spectrum is essential to a fair, consistent and logical auction that will maximize government auction revenue.

9.2 Regions where MCS and MDS incumbents hold portions of spectrum

Industry Canada seeks comments on whether government intervention is required where there are different MCS and MDS incumbents in the same geographic areas.

TELUS agrees that the band plan should emphasize the maximization of paired spectrum. We believe that Industry Canada should make all efforts to align the overall use of spectrum with the international band plan, which suggests encouraging incumbents to move towards an alignment with the international band plan in a timely fashion. Intervention by the Department should only be considered on a “where necessary” basis.

9.3 Effective use of the unpaired (TDD) block

The Department seeks comments on the challenges faced by more than one operator in making efficient use of the TDD block. Should Industry Canada rely on market forces or should it develop specific technical rules to facilitate coexistence between two or more operators and alignment with the Option 2 Band Plan?

TELUS believes that the most effective use of the TDD band is to build on the concept that many newer technologies are available for bandwidths that are multiples of 5 MHz. Wherever the Department licenses more than one operator in the TDD block in the same geographic area, the Department should allow the concerned operators to work towards mutually agreed operational arrangements to deal with interference issues. Failing an agreement however, the Department could then intervene. We do not support assignment of guard bands that are not aligned on 5 MHz boundaries. Further, Industry Canada should give some consideration to aligning the central 2596 MHz boundary with 2595 MHz, so as to permit the use of modern technologies with 5 MHz granularity.

We also note that network synchronization between operators introduces operational complexities which will likely make it impractical to operate and may limit the creation of innovative services to customers. Finally, it should be noted that the question of whether future technologies such as LTE and WiMAX can be synchronized has yet to be answered.

The Department should rely on market forces and technological evolution to drive the development of technical rules or solutions to facilitate coexistence and not limit the competitive environment for TDD services. Market forces will drive innovation.

9.4 Manitoba

The Department proposes to mandate the exchange of 20 MHz of the MDS spectrum for 20 MHz of the MCS spectrum as indicated in Figure 10.

Industry Canada seeks comments on this proposal.

TELUS agrees that the band plan should emphasize the maximization of paired spectrum. While we understand that some site-specific licences and spectrum are being grandfathered, we believe that Industry Canada should make all efforts to align the overall use of spectrum with the international band plan. TELUS strongly supports the proposal (section 9.4, option 2) to proceed with a direct reassignment per figure 10. TELUS makes this recommendation while still maintaining that incumbents should retain only 30MHz and therefore the mandated exchange would only be of 15MHz, not 20MHz.

9.5 Timing

Industry Canada is seeking comments on the timing aspects related to the physical migration of the existing network facilities to the new band plan, including the timing required for the completion of all transactions regarding spectrum exchanges.

TELUS recommends that incumbents should only be displaced from their existing spectrum assignments on a “where necessary” basis to permit the implementation of new BRS systems by other licensees. Incumbents should be given a period of 12 months starting from the issuance of a displacement notice by the Department. The Department should issue displacement notices after having reviewed and approved displacement requests from BRS licensees. TELUS notes that this approach would be consistent with the transition policy adopted by the Department for the Personal Communications Services (PCS) band³ and the Advanced Wireless Services (AWS) band⁴. TELUS also notes that given this band’s unique structure there could be geographical exceptions that would have to be dealt with on a case-by-case basis.

10. Next Steps

TELUS strongly recommends that the Department adopt the ITU band plan outlined in the Consultation as Option 2. TELUS also very strongly recommends that the Department adopt our Translation 3 as the fairest option most in keeping with the current 2006 Policy for this band to apportion the returned and retained FDD spectrum.

TELUS looks forward to registering reply comments and ultimately to the Department’s decision on changes related to the band plan. TELUS also looks forward to participating in the future consultation on the policy and licensing framework for this spectrum.

Yours truly

{Sent electronically}

Ed Prior

³ *Displacement of Fixed Service Stations Operating in the 2 GHz Frequency Range to Accommodate Licensed Personal Communications Services (PCS)*, CPC-2-1-09, Issue 2, July 2008.

⁴ *Consultation on a Framework to Auction Spectrum in the 2 GHz Range including Advanced Wireless Services*, DGTP-002-07, February 2007.