

SaskTel Comments:

Canada Gazette Notice DGSO-001-10

Decision on the Transition to
Broadband Radio Service (BRS) in the
Band 2500-2690 MHz and
Consultation on Changes
Related to the Band Plan

September 10, 2010

INTRODUCTION

Saskatchewan Telecommunications (“SaskTel” or “the Company”) is pleased to provide this response to Gazette Notice 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*”, dated June 4, 2010 (“the Consultation”).

SaskTel commends Industry Canada (“the Department”) for providing an opportunity for the telecommunications industry to submit comments on the complex issues involved with the transition of the 2.5 GHz band from Fixed services to flexible BRS licences, and the implementation of a new band plan for this spectrum.

SaskTel currently utilizes the 2500-2690 MHz band to provide wireless broadband services to rural Saskatchewan, targeting those residents and businesses that cannot economically be reached by DSL based wireline broadband access. SaskTel has installed 55 wireless hub sites, serving a large area of Saskatchewan, with thousands of subscribers. Changing to the proposed new band plan, as further discussed below, will require SaskTel to replace existing subscriber equipment for every customer location.

Due to the large geographical extent of the wireless network, the large number of subscribers, and the fact that most of these subscribers are in remote locations, a transition to network equipment compatible with the new band plan will be costly for SaskTel, and more importantly will take quite some time to complete, due to the fact that every subscriber location must be converted to the new equipment.

In addition, SaskTel’s network conversion must be closely co-ordinated and scheduled with Yourlink, the incumbent MDS operator in Saskatchewan. This is critical to ensure that service is not interrupted or degraded for customers on either network both during and after the transition process. This will add additional complexity to the already time consuming transition process. Any slowdowns or schedule disruptions from either SaskTel or Yourlink will directly affect the transition timeline for both networks.

In summary, SaskTel’s submission in response to the Consultation states that:

1. SaskTel supports the use of the ITU International band plan.

2. There is a need for the BRS Tier 3 spectrum licences to cover the entire province of Saskatchewan, matching the existing MCS spectrum licence.
3. TDD systems should not be permitted to operate in the FDD portion of the band due to interference.
4. Guard bands should be held in reserve by Industry Canada, and licence-exempt wireless systems should not be permitted to operate in the guard bands.
5. SaskTel is requesting Industry Canada re-examine the 2006 policy decisions in light of recent developments in the wireless industry, and provide flexibility for incumbent operators in the choice of spectrum blocks to be returned to the Department. The spectrum would be used most efficiently if incumbents were not forced to retain both FDD and TDD spectrum blocks. New spectrum holders would be given more flexibility in their network deployments if the Department allowed auction bidders the choice of FDD and TDD spectrum blocks in the upcoming spectrum auction.
6. SaskTel believes that spectrum trading on secondary markets, whereby licence holders negotiate and discuss spectrum trading and other issues directly with each other, is always the best initial approach. Only after this approach fails should Industry Canada intervene and directly implement Department policy.
7. Due to the extensive existing network deployments for both SaskTel and Yourlink across Saskatchewan, and the complexities of planning and coordinating the transition of both networks to the new band plan without disrupting service to customers, including equipment replacement at every customer location, SaskTel estimates it will take up to 3 years to complete the transition.

SaskTel has worked with the RABC on this Gazette notice to develop the RABC response, and SaskTel supports the RABC response to this Gazette notice. Several key issues raised in this consultation are of critical importance to SaskTel, and this document will provide further clarification of SaskTel's position on the issues raised in the consultation.

Below SaskTel offers our responses to the decisions and to the specific questions raised by the Department in the consultation. The numbering of this document corresponds to the numbering of the consultation paper.

SASKTEL RESPONSE TO THE DECISIONS ON THE TRANSITION TO BROADBAND RADIO SERVICE (BRS) IN THE BAND 2500-2690 MHz AND CONSULTATION ON CHANGES RELATED TO THE BAND PLAN

Part A – Firm Transition Date, Eligibility and Service Area

5.2 Geographic Service Areas

All eligible authorizations will be converted to BRS licences, with the geographic service areas based on the existing authorizations as follows:

- (1) Licensees holding MCS spectrum licences on a province-wide basis will be issued Tier 3 BRS licences and, in three cases (Yukon, Northwest Territories and Nunavut), Tier 4 licences will be issued;*
- (2) MDS operators will be issued Tier 3 licences where their MDS authorizations meet the eligibility criteria indicated in Section 5.1 above.*

Existing BRS licences issued in accordance with the voluntary conversion process will be modified from Tier 4 to the corresponding Tier 3 service area on the basis indicated above.

The current Tier-based spectrum licence service areas contain an anomaly for the City of Lloydminster, situated on the border between Alberta and Saskatchewan. The dividing boundary between the Tier 3 service area covering the Alberta side (3-044 Edmonton) and the Saskatchewan side (3-043 Saskatoon) does not follow the provincial border. Instead, all of the City of Lloydminster (both the Alberta and Saskatchewan sides) falls into service area 3-044 (Edmonton). This deviation from the provincial boundary was introduced by Industry Canada when the Tier-based service areas were first defined.

As outlined in the Consultation, the Department will issue Tier 3-based BRS licences to replace current province wide MCS licences. Should the existing Tier 3 service areas be followed for the BRS licences, SaskTel would be disadvantaged by the exclusion of the Saskatchewan side of Lloydminster from the SaskTel BRS spectrum licence.

SaskTel does not agree with the issue of a new BRS spectrum licence to SaskTel **that does not cover the entire province of Saskatchewan**. The existing MCS spectrum licence held by SaskTel (licence number 4925405) covers the entire province of

Saskatchewan, and we strongly believe that the fairest approach would be to issue new BRS spectrum licences that cover the same geographical area as the existing MCS spectrum licence, which includes the Saskatchewan side of Lloydminster.

Throughout the consultation process surrounding the transition to BRS services in the 2.5 GHz band, the Department has maintained the approach that incumbent MCS and MDS operators eligible for conversion to BRS spectrum licences should receive BRS spectrum licences covering the same service areas as their existing MCS or MDS licences. In SaskTel's opinion this would seem to be the fairest approach, and we see no reason why this same approach cannot be applied to Lloydminster.

SaskTel understands the reasons why the policy was made by the Department to avoid placing service area boundaries through population centres. Early cellular telephone technology and networks did have restrictions related to interference, and inter-system hand-offs allowing smooth transition of customers between networks were very problematic, if not impossible. However, with advances in wireless network technologies, these problems are no longer insurmountable. With close co-operation between SaskTel and other BRS spectrum licence holders, we see no reason why two networks cannot co-exist side by side, serving the respective sides of Lloydminster.

For the past century, SaskTel has been offering and maintaining some of the most innovative communications services for Saskatchewan residents. In fact, one of the first telephone lines built in Saskatchewan was to Lloydminster in 1907.

Over many years, Lloydminster residents, like their counterparts across the province, have come to rely upon SaskTel to provide unstinting service and the steady delivery of leading communications technologies as well as a day to day presence supporting programs and events within their community. This tradition is borne of the fact that Saskatchewan residents are not just customers but owners of SaskTel. This unique relationship maintains a bond between SaskTel and the average person that has endured over 100 years, and explains both their interest in SaskTel's success and their continuing loyalty, regardless of the wide range of options now available through competition.

Through SaskTel, Saskatchewan residents believe they have a role to play in the development of communications services in Saskatchewan. Excluding the Saskatchewan side of Lloydminster from the new BRS spectrum licence will serve to

arbitrarily break that fundamental bond for those residents, and will not only be viewed as preventing them from having the option of being able to receive telecommunications services from SaskTel but as an infringement of their basic ownership rights.

The Saskatchewan side of Lloydminster is currently in the midst of a period of rapid economic growth and expansion. The area is growing by leaps and bounds, and the provision of telecommunications services is essential to further this growth. In response to this growth, SaskTel has expanded our IPTV service to Lloydminster, and the increasing number of Saskatchewan residents of Lloydminster continue to look to SaskTel for additional services. To exclude the Saskatchewan side of Lloydminster is a disservice to those residents, and tantamount to expropriation without compensation.

Moreover, SaskTel is the incumbent wireline service provider for Saskatchewan, and has a mandate from the provincial government to provide services to all residents of Saskatchewan, both urban and rural, near and remote from populated centres. SaskTel cannot provide these services without access to spectrum in all areas of the province.

Therefore, in fairness to all parties involved, **SaskTel recommends that the new BRS spectrum licences be issued covering the entire province of Saskatchewan to match the existing licence.**

Although SaskTel does agree with the use of Tier 3 service areas for the BRS spectrum licences, we believe that an exception or amendment can be made by the Department to allow SaskTel's BRS spectrum licences to cover the entire province of Saskatchewan. For example, the Department has in the past created sub-divisions of service areas, and has also established TEL serving areas corresponding to incumbent wireline telephone company serving areas. These approaches are two examples of mechanisms that could be used by the Department to facilitate the issuance of spectrum licences covering the entire province of Saskatchewan, while still maintaining a linkage to the Tier-based structured service areas.

Part B – Consultation on Band Plan

8. The Frequency Band Plan

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

SaskTel does not support harmonization with the U.S. band plan. In our view, implementation of the U.S. band plan in Canada would overall be detrimental to current and future BRS spectrum license holders, and not in the best interests of Canadians because the economies of scale are potentially far greater with the international band plan compared to the U.S. band plan (option 2 in the Consultation).

8.2 Option 2 – Harmonize with the international band plan

SaskTel agrees with the Department's proposal to implement the international band plan. SaskTel notes that this band plan is aligned with Arrangement C1 from [Recommendation ITU-R M.1036-3](#), [CITEL Recommendation PCC.II/REC.8\(IV-04\)](#) and [CEPT Decision ECC/DEC/\(05\)05](#). This band plan also aligns with 3GPP bands 7 and 38 from [3GPP TS 36.101](#).

As stated in the RABC response to the Consultation, “*base and user equipment compliant with Option 2 is available today from several vendors, which will provide immediate economies of scale without any requirement of Canadian customization and will immediately support international roaming.*” In addition, numerous administrations are in various stages of the process of auctioning this spectrum, and are following the ITU international band plan. Momentum is gathering globally for the use of the ITU internationally harmonized band plan, further increasing future economies of scale for user devices.

SaskTel agrees with the Department that, as stated in the Consultation:

“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 spectral 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.”

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.

SaskTel fully supports the Department’s proposal to implement the international band plan, presented as the Option 2 model of the band plan in the Consultation, for BRS in the band 2500-2690 MHz.

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

SaskTel does not believe that operation of TDD systems should be permitted in the FDD portion of the band plan, except as required, on a non-interference basis, for the incumbent transition process. This is because of the great potential for interference between networks with differing duplexing schemes.

As noted in the Consultation, ITU and ECC Reports and studies have shown a great potential for interference between FDD and TDD systems deployed in the same geographical service area. Interference can occur:

- between service provider base stations (either co-located at the same site, or operating from different sites located close together),

- between the base station and nearby mobile stations (i.e. user devices),
- and between mobile stations.

As detailed in the ECC Report, without the implementation of guard bands between the FDD and TDD systems, extensive interference mitigation measures will be required to be implemented on both networks. For base station to base station interference, the extent of the required mitigation measures directly depends on a number of factors such as transmitter power, bandwidth, antenna isolation, tower installations, and site locations, as well as factors related to RF propagation conditions. As all of these factors are unique to each location, a customized engineering study and design would be required for each site installation. This would be very expensive to implement, and there will be cases where the interference will be extremely difficult or even impossible to eliminate with these mitigation measures.

Mitigation of interference between user devices and base stations; or between multiple user devices poses even greater challenges. The mobility of the user device introduces greater potential for interference, particularly between user devices. In an urban setting, it is very likely that user devices operating on TDD and FDD networks will frequently be located very close together, with interference mitigation under these conditions impossible without the use of guard bands.

Therefore, the only reasonable method by which TDD and FDD systems could co-exist in the same area would be through the implementation of guard bands to protect each system. This creates a very inefficient utilization of the spectrum. The guard bands become almost useless spectrum, and with spectrum becoming more and more congested, wasted spectrum needs to be eliminated.

As for allowing differing systems (i.e. TDD and FDD) systems to operate on the same or adjacent spectrum blocks in different geographical areas, SaskTel does not see this as a viable long term option. Allowing such operation will place future restrictions on the geographic expansion of the networks for both the FDD and TDD operators. If, for example, a TDD network is established in the FDD spectrum blocks in an area not being served by the FDD operator, then the FDD operator faces difficulty expanding their network into the area covered by the TDD network. The TDD operator is now in the position of having to modify and retrofit their TDD network in a timely manner to

accommodate the deployment of the FDD network, and the FDD operator is likely to be restricted with their network expansion.

Therefore, due to the strong potential for interference, and the necessary restrictions on network operation and expansion for both FDD and TDD networks, SaskTel recommends that TDD systems not be allowed to operate in the FDD portion of the spectrum. It must be recognized that temporary operation of TDD systems in FDD spectrum blocks may be required to allow the transition by incumbent MCS and MDS operators from the existing spectrum band plan to the new band plan. SaskTel strongly believes that TDD operation in the FDD portion of the spectrum is impossible without the use of additional guard bands, which would create a very inefficient utilization of valuable spectrum.

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)?

SaskTel believes that the guard bands should be held in reserve by Industry Canada at this time, primarily to ensure the orderly introduction and deployment of both FDD and TDD based BRS systems. It is a reasonable assumption that the vast majority of new BRS deployments will occur in heavily populated urban areas, with all of the operators focusing on the same congested urban markets. Under these conditions, within the congested urban areas, the guard bands are best left in place, in reserve with Industry Canada, while the band is being developed and the networks are being deployed. The primary goal should be the protection of both FDD and TDD systems from harmful interference.

All of the studies that have been made on this issue point out clearly that there must stringent power, bandwidth, or geographical restriction with any use of the guard bands to prevent interference to FDD systems. However, there is a range of opinion on what those restrictions should be, and to make matters worse the restrictions are based on assumptions regarding network deployments. Only a limited number of new systems in the 2.6 GHz band have been deployed or have been trialed. There is limited evidence from equipment and field trials to verify the required operational restrictions in the guard bands.

The guard bands cannot be made part of the unpaired TDD spectrum until the operational restrictions on the use of the guard bands have been determined and verified.

SaskTel believes it would be best to wait until 2.6 GHz band equipment has been more fully developed before establishing the operating restrictions. This includes both network infrastructure (base stations) and user devices.

Once the operating restrictions have been established and verified with field trials to confirm there will be no harmful interference to FDD networks, then consideration can be given to releasing the guard band spectrum for limited use. SaskTel suggests that potential license holders wishing to use the guard band spectrum provide clear and firm plans to utilize the spectrum within the required operational restrictions before being granted use of the spectrum. There is a risk that a license holder may obtain the guard band spectrum, and then find they are unable to use the guard band spectrum due to the restrictions.

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, SaskTel believes that it is premature to release the guard band spectrum, and that it should be held in reserve until operational restrictions on the use of the bands, required to prevent interference with FDD systems, can be more clearly defined and verified against actual network deployments.

Furthermore, SaskTel strongly believes that licence exempt systems should not be allowed to operate in the guard band spectrum. Licence exempt systems, by their very nature, are very difficult to administer, control, track, monitor, and regulate. The primary function of the guard band spectrum is to provide interference protection to FDD systems, and allowing licence exempt systems to operate in the guard band spectrum would run counter to that goal. Without proper control of the deployment of licence exempt systems, it is not possible to properly control interference.

As noted in the RABC submission to this Gazette notice, another factor to consider is aggregate interference. Because there is little to no control over licence exempt systems, it is not possible to control the level of aggregate interference that could be created with the operation of multiple licence exempt systems in the same area.

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

In the interests of maximizing spectral efficiency, and considering the growing demand for delivery of mobile broadband services at higher data rates, SaskTel believes that contiguous spectrum blocks should be assigned to each operator. Block assignments should be aligned on 5 MHz boundaries in order to align with the ITU international band plan. SaskTel believes that FDD spectrum blocks should be allocated with a minimum block size of 20 MHz (10+10 MHz) to allow for higher bandwidth services.

9. Mapping of Incumbents into Option 2 Band Plan

As described in the Consultation, Saskatchewan is an area of the country where both an MCS incumbent (SaskTel) and an MDS incumbent (Yourlink Inc.) currently each hold 2.5 GHz spectrum. To further complicate matters, both SaskTel and Yourlink have deployed extensive networks across Saskatchewan, serving primarily rural customers. SaskTel provides wireless broadband services in areas that cannot be economically served by wireline (i.e. DSL technology). Yourlink provides not only wireless broadband services, but broadcast video services as well to their customers.

SaskTel has determined that in order to migrate to the new band plan, the existing DOCSIS based customer premise equipment (CPE) being used by SaskTel must be replaced. The RF components are not field adjustable for the required change in frequency, and will require a complete replacement. This must be done tower by tower, region by region, while still maintaining service to our customers. The change out schedule must also be closely planned and coordinated with Yourlink's network transition, to ensure customers on both networks do not experience service degradation or outages, as much as possible.

FDD and TDD Spectrum Blocks

In order to eliminate or minimize customer disruptions, and to ensure efficient spectrum utilization after the network and spectrum transition is complete, flexibility will be required by the Department in their implementation of policies and regulation of this band.

As noted in section 9 of the Consultation:

"FDD and TDD radio systems are not interoperable. Furthermore, they cannot be co-sited unless sufficient frequency separation exists and additional filtering is implemented on both systems. An operator deploying a TDD system may

encounter serious operational challenges in deploying an FDD overlay on the same set of sites.”

SaskTel has also looked into the issues surrounding the deployment of both FDD and TDD systems in the same band, and strongly agrees with the Department. ITU-R Report M.2030 and ECC Report 119 both demonstrate that guard bands are an essential mitigation measure to reduce interference between TDD and FDD systems operating in the same area. However, even with guard bands in place, additional mitigation measures will likely be required in urban deployments.

As stated in ECC Report 119:

“... the interference between a TDD system and a FDD system is significant, whether base stations are co-sited or not, even with a guard band of 5 MHz. Report ITU-R M.2030 has stricter TDD ACLR, but interference is still high. For scenarios within CEPT with dense deployment in cities it is obviously not realistic to obtain sufficient isolation by geographical separation only, even with a guard band of 5 MHz, unless additional measures are taken.”¹

It must be noted that the strict interference mitigation measures require an engineering study and design for each base station site. With the radio towers becoming more crowded with antennas, achieving sufficient antenna isolation at all sites will be very difficult, and impossible at some sites. Due to the nature of interference and radio propagation, even with interference mitigation measures in place, there is still a small probability of interference. With the large number of sites in urban areas, it becomes probable that there will be interference at one or more sites.

Because of the cost and complexity of trying to overlay a TDD and FDD network using the same set of towers and radio sites, it is not economical or practical for SaskTel to attempt to operate both TDD and FDD based networks. It is more realistic for SaskTel to expand the capacity of an FDD network through either additional channels or additional sites, rather than attempt a TDD overlay.

¹ CEPT Electronic Communications Committee (ECC) Report 119, section 3.5.1, page 16, June 2008.

Therefore, should SaskTel acquire both FDD and TDD spectrum blocks through the incumbent spectrum mapping process, the TDD spectrum blocks assigned to SaskTel could not be utilized. This will lead to very inefficient spectrum utilization.

SaskTel notes that considerable development work has been done on the time division duplex based TD-LTE technology, and work is proceeding on an aggressive schedule. This now leaves 3 viable equipment options for the deployment of new networks by BRS spectrum licence holders, namely FDD based LTE, TD-LTE, or TDD based WiMAX. It is also the accepted norm that all new user devices will be multi-band and multi-mode. For example, even low end LTE devices are expected to support both LTE and TD-LTE modes, with the number of spectrum bands supported dependent on the cost of the device.

Therefore, a new BRS spectrum licence holder would have viable options to deploy a network using the TDD spectrum blocks. This now raises the value of TDD spectrum blocks to a level comparable to FDD spectrum blocks, on a \$/MHz/pop basis. Historically this has not always been the case. In past spectrum auctions, the TDD spectrum blocks have been perceived as having a lower value, and have received lower bids in spectrum auctions.

With the advancement of TD-LTE, results from the most recent spectrum auctions are showing that the TDD spectrum blocks are receiving bids, on a \$/MHz/pop basis, that are equal in value to FDD spectrum blocks. For example, [results from the recent 2.6 GHz spectrum auction in Germany](#) show that the 5 MHz TDD blocks at 2.6 GHz received final bids that were approximately half of the value of the bids for the 10 MHz FDD blocks. Therefore, considering the TDD blocks are half the size of the FDD blocks, the \$/MHz/pop equivalent costs for the TDD and FDD blocks are about the same.²

When Industry Canada made their decisions for the 2006 policy (DGTP-002-06 – *Policy Provisions for the Band 2500-2690 MHz to Facilitate Future Mobile Service*), the TDD spectrum blocks were considered to be of a much lower value than the FDD spectrum blocks. Although the policy allows for “approximately” one third of the incumbent spectrum to be returned to the Department, the policy goes on to clearly state that the

² German Spectrum Auction Results (in German)
<http://www2.bundesnetzagentur.de/frequenzversteigerung2010/ergebnisse.html>

bands 2535-2568 MHz and 2657-2690 MHz will be returned to the Department. These spectrum bands are FDD spectrum blocks, implying that the spectrum to be auctioned off by the Department in areas with both MCS and MDS incumbents must be FDD spectrum blocks only, a decision made because of their higher perceived value at that time.

As explained above, the aggressive development of TD-LTE technology, along with the more mature TDD based WiMAX, has given operators more technology choices for 2.6 GHz network deployments. As clearly shown by the results of the German spectrum auction, the TDD spectrum blocks no longer have a perceived value less than FDD spectrum blocks.

Therefore, due to the many changes that have occurred in the wireless industry since 2006, **SaskTel is formally requesting that the Department re-examine the 2006 policy decision mandating that the incumbents must specifically return the spectrum bands 2535-2568 MHz and 2657-2690 MHz (FDD) for auction by the Department.**

SaskTel believes that incumbents should be required to return approximately one third of their spectrum, **but the incumbents should be given flexibility in deciding which spectrum blocks to return to the Department, and that (as much as possible) incumbents should not be encumbered by a mixture of FDD and TDD spectrum blocks within the remaining two thirds of their spectrum (60 MHz).** In the case of SaskTel, by retaining only FDD spectrum blocks, no TDD spectrum blocks would sit idle because of SaskTel's inability to utilize them. If operators were able to retain only one type of spectrum block (either FDD or TDD) then this would lead to the most efficient spectrum utilization for this band.

SaskTel is proposing that rather than auctioning off only FDD spectrum blocks in Saskatchewan, the Department could auction off a mixture of FDD and TDD spectrum blocks. This gives new spectrum licence holders more flexibility in choosing the type of blocks they desire, and will allow better network interfacing with spectrum blocks in other portions of the country, where both FDD and TDD spectrum blocks will be auctioned. Flexible duplexing choices will therefore provide new spectrum holders more flexibility in choosing technologies for their network builds. By providing a mixture of both TDD and FDD spectrum blocks in the future spectrum auction, spectrum utilization becomes most

efficient as new licence holders will select the type of spectrum blocks most compatible with their network building plans.

Incumbent Negotiations

Being the MCS and MDS incumbents in Saskatchewan, and both having the same goal of continuing to provide uninterrupted service to our primarily rural base of customers, SaskTel and Yourlink have developed a good working relationship. The extensive network deployments of both SaskTel and Yourlink will make planning for network transition to the new band plan very complex. Close coordination and planning will be required between SaskTel and Yourlink for a successful transition. We believe the most efficient spectrum utilization after transition will occur by carefully planning the transition. SaskTel believes this is best accomplished by working closely with Yourlink directly, and we do not believe that government intervention will be required, nor will intervention produce the most beneficial outcome. Once the crucial transition planning is completed, then the most suitable post-transition spectrum blocks for each incumbent can be determined.

SaskTel believes that secondary market trading is always the preferred option, and that direct action or intervention by the Department should only be implemented when secondary market trading has failed to produce an outcome in alignment with Industry Canada policy.

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.

SaskTel agrees with the proposal to exchange the MCS and MDS spectrum blocks as indicated in Figure 5 of the Consultation.

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.

SaskTel and Yourlink, the MCS and MDS incumbents in Saskatchewan, have developed a good working relationship. We are both already discussing the issues, options, and

alternatives for transitioning the networks of both SaskTel and Yourlink to the new band plan, which requires network replacement and migration of customers in an orderly fashion, without disruption of service. At the same time, the transition planning will free up spectrum to return to the Department. SaskTel believes this is best done by incumbents, with detailed knowledge of the network architecture, and that government intervention will not be required.

It is expected that the outcome of the SaskTel and Yourlink network transition will be spectrum block assignments similar to Figure 7 in the Consultation. The final configuration will depend on the planning process for the transition. However, as mentioned earlier in our submission (Section 9), SaskTel is looking for some flexibility from the Department on the exact spectrum blocks to be retained by each incumbent. SaskTel looks forward to working with the Department to come up with spectrum block assignments for each incumbent in Saskatchewan that will both meet the needs of SaskTel and Yourlink to prevent service disruptions and continue to provide essential broadband services to our rural customers, and meet the needs of the Department with regards to efficient spectrum utilization, and future spectrum auctions.

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?

SaskTel notes that network synchronization between different operators is impractical, or even impossible. As noted in the Consultation, if the operators are using the same technology, then synchronizing the two networks together locks the two networks into the same network configuration. This restriction makes it almost impossible for one operator to introduce innovative or competitive services. At this time it has not been determined if it will ever be possible at some future date to synchronize differing technologies such as WiMAX and TD-LTE.

This leaves the use of guard bands as the only viable option for co-existence of TDD systems in the same service area. Guard bands are very inefficient for spectrum utilization. SaskTel notes that all future technologies are based on multiples of 5 MHz channel sizes. The recommended international band plan is also based on 5 MHz

channel blocks. Furthermore, SaskTel recommends that the current 2596 MHz boundary between MCS and MDS spectrum be modified to 2595 MHz, in order to align with the ITU band plan.

SaskTel does not support the mandatory assignment of guard bands that do not align with the 5 MHz channel sizes, and the spectrum block edges defined in the ITU band plan.

The most efficient utilization of the centre TDD block of the 2.6 GHz band is to assign the spectrum to one operator. However, if the Department assigns by spectrum auction or other means, the centre TDD block of spectrum to multiple operators in the same service areas, then SaskTel suggests that the affected operators be allowed to work towards a mutually beneficial operational arrangement that would allow the networks to co-exist. The Department could intervene if the operators fail to come to an agreement.

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.

SaskTel notes that MCS site specific licences in Manitoba will be grandfathered. SaskTel encourages the Department to make all practical efforts to align the overall use of the spectrum in Manitoba to the ITU international band plan. Incumbents should only be displaced on a “where necessary” basis. The operational needs of the school boards must be considered, and SaskTel notes the commitment made by the Department to provide the school boards with protection from interference from BRS systems.

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.

SaskTel recommends that incumbents should only be displaced from their existing spectrum assignments on a “where necessary” basis, after having reviewed and approved displacement requests received from BRS licensees. SaskTel notes that this approach would be consistent with the transition policy adopted by the Department for the

Personal Communications Services (PCS) band and the Advanced Wireless Services (AWS) band.

SaskTel currently utilizes the 2500-2690 MHz band to provide wireless broadband services to rural Saskatchewan, targeting those residents and businesses that cannot economically be reached by DSL based wireline broadband access. SaskTel has installed 55 wireless hub sites, serving a large area of Saskatchewan, with thousands of subscribers. Changing to the new proposed band plan will require SaskTel to physically replace existing subscriber equipment at every customer location.

Due to the large geographical extent of the wireless network, the large number of subscribers, and the fact that most of these subscribers are in remote locations, a transition to network equipment compatible with the new band plan will be costly for SaskTel, and more importantly will take quite some time to complete, due to the fact that every subscriber location must be converted to the new equipment.

In addition, SaskTel's network conversion must be closely co-ordinated and scheduled with Yourlink, the incumbent MDS operator in Saskatchewan. This is critical to ensure that service is not interrupted or degraded for customers on either network both during and after the transition process. It is anticipated that each tower and the corresponding service region will have to be separately scheduled to coordinate with Yourlink's network migration, and minimize interference and disruptions during the migration process. This will add additional complexity to the already time consuming equipment replacement process. Any slowdowns or schedule disruptions from either SaskTel or Yourlink will directly affect the transition timeline for both networks.

In view of the above, and given the very slow pace of outdoor work during winter, we estimate that such a transition will require 3 years to complete.

10. Next Steps

SaskTel is willing to participate in any future consultations on the policy and licensing of this spectrum. SaskTel will also be pleased to discuss further with the Department any issues surrounding our network migration and spectrum transition to the new band plan.

CONCLUSION

SaskTel is pleased to have had the opportunity to provide comments to the 2.5 GHz BRS consultation. There are many complex issues and questions for the Department to consider regarding the future development of this spectrum, allowing the deployment of new and innovative broadband wireless services for Canadians, while protecting incumbent users such as SaskTel providing essential wireless broadband services primarily in rural areas of Saskatchewan.

SaskTel trusts that the comments provided in response to the consultation can provide the Department the advice and direction needed to establish policies that will see the 2.5 GHz spectrum developed to the maximum benefit of all Canadians.