

Comments — *Canada Gazette* Notice DGRB-018-99

Bell Wireless Alliance Response to:

**Notice No. DGRB-018-99 – Consultation on the Proposed
Policy and Licensing Procedures for the Auction of PCS
Spectrum in the 2 GHz Frequency Range (PCS – 2GHz)**

Published in the *Canada Gazette, part 1* dated December 17, 1999

Submission by

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MT&T Mobility Inc., NBTel Inc.,
NewTel Mobility Limited, and Saskatchewan
Telecommunications Holding Corporation**

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EXECUTIVE SUMMARY

In this consultation, Industry Canada is establishing the licensing policy that will govern the allocation, through spectrum auction, of the 40 MHz of spectrum held in reserve in 1995 when PCS was introduced in Canada. This licensing policy will determine the industry structure of the Canadian wireless industry at a critical juncture in its evolution. The very health and viability of the industry hinges on the policies flowing from this consultation.

When PCS licences were awarded in 1995, Industry Canada chose an industry structure consisting of four licensees all of whom, for all intents and purposes, have operated their licences as national service providers. This industry structure has served Canada well. PCS services have been deployed in all regions of Canada, prices for Canadian wireless services are among the lowest in the world and wireless service innovation is thriving. Moreover, the penetration of wireless services in Canada, reflecting both the vigorous marketing campaigns of the carriers and significant price reductions, is growing substantially.

However, dramatic reductions in wireless prices, resulting in overall revenue declines, coupled with capital intensive network build-out and digital conversion programs, has resulted in thin operating margins for all existing players. Moreover, the intense price competition in the Canadian market, when coupled with the smaller and more geographically dispersed market characteristics, means that service providers here are even more challenged than their counterparts in the U.S. or Europe. This situation has raised concerns about the viability of the industry in some quarters. In addition, while Industry Canada originally chose a four player industry structure, the four have now become five with the dissolution of Mobility Canada.

Based on the above considerations, the Bell Wireless Alliance believes that introducing new entrants, beyond the current five players, into the Canadian market would not be in the public interest. Competition is vigorous in the market today and customers are seeing the benefits of that competition. As the Department notes in its consultation paper, licensing further new entrants at this time could very well splinter the market, and weaken the mobile wireless industry, in the longer term.

The Bell Wireless Alliance's members are at the forefront of service innovation and network deployment in Canada. However, some Bell Wireless Alliance members require additional spectrum to address capacity demands in their networks. Similarly, former members of Mobility Canada need additional spectrum in order to compete and deploy services nationally. Additional spectrum will also enable the Bell Wireless Alliance's members to continue to develop and deploy new innovative services, including the development of 3G wireless services in Canada. Consequently, the Bell Wireless Alliance believes that former Mobility Canada members should be permitted to acquire additional PCS spectrum both inside and outside of their traditional serving areas.

The Bell Wireless Alliance is of the view that the remaining 40 MHz of PCS spectrum should be allocated as four blocks of spectrum, consisting of 10 MHz each and authorized as national licences. This will facilitate the deployment of new innovative and competitive wireless services on a national basis while recognizing the limitations of the Canadian market to viably sustain more competitors beyond the current five service providers.

Concerning the proposals outlined under Technical Considerations, Conditions of Licence, Licensing Process and Auction Design and Financial Aspects, the Bell Wireless Alliance generally supports the Department's proposals in these areas subject to the following:

Conditions of Licence:

Research and Development Commitment: Auctions represent a fundamental change in the manner of allocating spectrum in Canada. Auctions utilize a market-based approach to allocate spectrum and to derive an economic rent for the owners of this public resource. In light of this, the Bell Wireless Alliance does not believe that it is appropriate to extract even further rent from service providers in the form of a research and development mandate for that spectrum which is acquired through auction. In the event that an R&D mandate is imposed, the proposed method of tracking R&D associated with transferred licences, is administratively burdensome. The reporting arrangements, associated with transferred spectrum, should be left to the parties involved in a transfer to determine as part of their business negotiations.

Lawful Intercept: The Bell Wireless Alliance supports the lawful intercept condition under the assumption that this functionality will be supported under a self-funding environment and will generally be aligned with North American industry standards.

Annual Reporting: While supporting the annual reporting requirements, the Bell Wireless Alliance recommends that service providers be permitted to consolidate all reporting with all licences it holds, e.g. cellular and current PCS licences.

Financial Aspects:

As an alternative to the opening bids proposed by the Department, the Bell Wireless Alliance has proposed a three-level schedule based on population density.

In conclusion, the Bell Wireless Alliance looks forward to the expeditious release of the Department's final licensing policy and the commencement of Canada's first PCS auction.

Comments – *Canada Gazette* Notice DGRB-018-99

Bell Wireless Alliance response to:

Notice No. DGRB-018-99 – **Consultation on the Proposed Policy and Licensing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range (PCS – 2 GHz)** Published in the *Canada Gazette, Part 1* dated December 17, 1999.

1. INTRODUCTION

The Bell Wireless Alliance is pleased to provide the following comments in response to Notice No. DGRB-018-99 - **Consultation on the Proposed Policy and Licensing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range (PCS – 2 GHz)** as published in the *Canada Gazette, Part 1* and dated December 17, 1999.

The Bell Wireless Alliance (BWA) consists of Bell Mobility Inc., Island Telecom Inc., MTS Communications Inc., MT&T Mobility Incorporated, NBTel Inc., NewTel Mobility Limited, Saskatchewan Telecommunications Holding Corporation.

The BWA's members operate throughout Canada providing, among other things, public switched mobile voice services in both the 800 MHz cellular and 2 GHz Personal Communication Services (PCS) bands.

Pursuant to the *Radiocommunication Act*, Industry Canada is responsible for the management of Canada's radio frequency spectrum. By virtue of its licensing authority, the Department determines the industry structure of the Canadian wireless market. In this regard, the Department's document, *A Spectrum Policy Framework for Canada*, September 1992 identified, at page 7, a number of core objectives of Canadian spectrum policy. Foremost among these objectives was the recognition that the Department's role was:

To promote and support the orderly development and efficient operation of radiocommunication systems and services to meet Canada's sovereignty and security needs as well as to yield economic, cultural and social benefits for Canadians.

Clearly, the Department recognizes the responsibility it bears in overseeing the orderly development of the wireless industry. It would not be an exaggeration to suggest that, in today's dynamic and intensely competitive wireless market, the impact of such spectrum policy decisions can be measured in the billions of dollars. Such policies also directly influence the very viability of the wireless industry.

A number of BWA's members are currently subject to the regulatory authority of the Canadian Radio-television and Telecommunications Commission (CRTC). The CRTC has found the degree of competition in the wireless industry to be sufficient such as to warrant forbearance in virtually all areas including the prices for wireless services.

In 1999, over \$1 billion was invested in Canada's wireless infrastructure. Investments by wireless carriers since 1987 have totaled in excess of \$10 billion. The BWA's members, and indeed all former members of Mobility Canada, are justifiably proud that this infrastructure is widely deployed throughout Canada and not only focused on the larger metropolitan markets.

When PCS licences were awarded in 1995, Industry Canada chose an industry structure consisting of four licensees all of whom, for all intents and purposes, have operated their licences as national service providers. This industry structure has served Canada well. PCS services have been deployed in all regions of Canada, prices for Canadian wireless services are among the lowest in the world and wireless service innovation is thriving. Moreover, the penetration of wireless services in Canada, reflecting both the vigorous marketing campaigns of the carriers and significant price reductions, is growing substantially.

The BWA commends Industry Canada on the timely release of Notice No. DGRB-018-99 and welcomes the Department's initiative in making spectrum available to ensure the continued orderly development of PCS. The BWA believes that the expeditious allocation of additional PCS spectrum will substantially advance the Government of Canada's connectedness agenda. This will be particularly relevant as the industry evolves towards 3G wireless, and couples the power and explosive growth of the Internet with that of wireless communications. The allocation of additional PCS spectrum will provide the means to ensure that Canadian consumers continue to have access to cutting edge wireless services now and in the future. Allocation of additional PCS spectrum also ensures that Canadian businesses continue to have access to the state-of-the-art wireless voice and data services that will enhance their competitiveness in the global market place.

2. EVOLUTION OF MOBILITY CANADA

Prior to May 1999, BWA's members were shareholders in Mobility Canada. Mobility Canada was an alliance of wireless service providers cooperating in the provision of wireless services and related support to national customers. Pursuant to an agreement signed on May 10, 1999, Mobility Canada was dissolved, thus enabling the former members to compete with one another.

As a result of the dissolution of Mobility Canada, former Mobility Canada shareholder TELUS Mobility will be offering service on a national basis. BWA's members will also be offering service on a national basis. These groups will require

additional spectrum to enable facilities-based competition and to facilitate the development of new competitive services nationally.

Consequently, the Department's original four-player model for the industry has changed as the four players have now become five with the dissolution of Mobility Canada. This represents a significant change in the competitive make up and structure of the Canadian wireless industry. The BWA believes that this fact should weigh heavily in the Department's consideration of whether or not additional new entrants should be licenced.

THE BWA'S RESPONSE TO SPECIFIC ISSUES RAISED IN THE CONSULTATION PAPER

To facilitate the use of these comments, BWA's submission addresses the issues raised for comment in the order of their appearance in the consultation paper. For further clarity, the specific issue or question being addressed is encapsulated preceding the BWA's response.

3. ELIGIBILITY TO ACQUIRE SPECTRUM

From the inception of cellular service in the mid-1980's, the Government has pursued a licensing policy for wireless services premised on competition in the wireless marketplace. As a result, there has never been a monopoly in the wireless market. Customers have always had a choice of alternative facilities-based service providers. Competitive choice was dramatically increased in 1995 with the licensing of two new entrants to provide PCS at 2 GHz. Developments since then, especially with respect to wireless pricing trends, clearly indicate that no one firm can unilaterally impose a profitable price increase. Today, industry observers and participants alike frequently refer to the Canadian wireless market as being intensely competitive. No service provider in the Canadian wireless market has market power and the CRTC has found the wireless market to be sufficiently competitive to warrant forbearance from the regulation of wireless prices. While the need for additional spectrum may vary among them, BWA believes that all existing PCS licensees are eligible to acquire additional PCS spectrum.

3.1 *The Department seeks comments as to whether and how the public interest would be served by limiting the eligibility of any potential applicants to participate in the auction.*

The Department's discussion of this item, at Section 3.2 of the consultation paper, requests comments on the possibility of new entrants participating in the PCS auction. It is noted that this would be in addition to those entities currently licenced to provide cellular and PCS services.

The BWA agrees with the view expressed by the Department that increasing competition in cellular and PCS services has provided the benefits of lower costs and expanded service offerings to Canadians. Significantly, the Department also notes

its mindfulness of the large capital outlays that have been committed by the existing licensees in order to roll out network infrastructures and meet Departmental licensing requirements. In light of this fact, the BWA also agrees with the Department's concern that a licensing policy which either permits or guarantees the entry of new service providers could splinter and weaken the mobile wireless telecommunications market in the longer term.

The BWA notes that, by any measure, Industry Canada's 1995 Licensing Policy for PCS has been singularly successful in stimulating competition in the wireless sector and providing Canadians with consumer choice, lower prices and a high degree of service innovation.

3.1.1 Consumer Choice

As noted above, Canadian wireless customers have always had the benefit of having a choice of alternate service providers. In 1995, competitive choice was significantly enhanced with the licensing of two new entrants, in addition to the two cellular incumbents, to provide PCS services on a national basis. This was a landmark event fundamentally altering the competitive landscape of the Canadian wireless industry.

The groundwork to further enhance customer choice was laid in May 1999 with the dissolution of the Mobility Canada Alliance. As early as March 2000, using inter-carrier sale and roaming arrangements, customers in the Canadian wireless marketplace will see an increase in the number of wireless service providers (WSPs) from four to five, as the former Mobility Canada members begin to offer competing services on a national basis.

Departmental policy makers, in considering issues related to industry structure, must recognize that should a new entrant be licenced, as a result of the final licensing policy adopted by the Department, this would result in a sixth player entering the Canadian wireless market. In this event, and in the context of the Canadian market, the BWA shares the Department's concern that such a development could very well splinter the market with subsequent adverse effects on the viability of the players. The BWA does not believe such a result would be in the public interest.

3.1.2 Lower Prices

The changes in Canadian wireless pricing over the past four years have been, to say the least, dramatic. The extent of these changes was addressed in a June 1999 Yankee Group study entitled, *Talk Is Cheap: Canadian Wireless Rates are Among the Lowest in the World*. Yankee's study noted that overall North American prices (as measured in Toronto and five of the largest U.S. metropolitan markets e.g. Chicago, Los Angeles, Miami, Boston, and New York) had decreased by an average of 38% since 1996. The study noted that Canada, particularly at the lower

usage levels (e.g. 60 minutes of use or less) experienced the greatest declines. This is significant for a number of reasons. First, given the larger population densities of these U.S. cities, as well as FCC licensing policies, most of these centres receive coverage from as many as six wireless carriers. Nevertheless, Canada's much smaller and widely dispersed population base, with until recently four service providers, is matching and in some cases exceeding, price point declines in these larger U.S. markets. Second, the Yankee study indicates that while they also experience declines, it is not just large corporate users who are benefiting from the Canadian wireless price reductions. As noted above, price declines in the lower (i.e. consumer) level market segments exceed those of the higher usage customers.

1999 also witnessed significant pricing innovation throughout North America with the introduction of digital one-rate plans and prepaid service. These pricing innovations have typically simplified pricing plans and lowered the price points for wireless services in general. While Canadian consumers have responded enthusiastically to these pricing innovations, prepaid service in particular is having a dramatic affect on penetration rates. In this regard, another Yankee Group study, *Uncharted Territory: Prepaid Wireless Explodes into Canada*, June 1999, examined the effect of this pricing innovation. At the time of the study, three of Canada's four wireless carriers (i.e. Mobility Canada was counted as a national carrier and Clearnet had not yet introduced the option), Yankee Group concluded at page 10 that:

Subscriber growth in Canada has skyrocketed since the introduction of prepaid. We anticipate that all carriers will adopt some form of a prepaid program in 1999 to [remain] competitive and gain market share.

Events have proven the study's predictions to be correct. In July 1999, responding to competitive market pressure, Clearnet added a prepaid option to its portfolio. Moreover, preliminary fourth quarter 1999 subscriber results indicate that penetration, as the Yankee study suggested, is skyrocketing. Clearnet, for example, has reported preliminary results indicating that 4Q99 subscriber additions represent a record quarter to date and an increase of 44% over 4Q98 results. Rogers AT&T similarly reported a record quarter with 4Q99 exceeding the same period a year earlier by 36%. Microcell, for its part, noted that it too had broken previous subscriber additions records and had more than doubled (i.e. an increase of 107%) its subscriber base 1999/1998.

3.1.3 Service Innovation

Among the objectives for PCS announced by the Department in its June 1995 licensing policy, at page 4, was:

b) the provision of additional and innovative personal communications services at 2GHz, rather than only the replication by similar services of the mobile services currently operating below 1 GHz;

BWA's members have responded enthusiastically to this objective and have established themselves as North American leaders in the development and introduction of innovative services in the 2 GHz range. What started as a simple way for business executives to keep in touch while on the move, is evolving into one of the most important tools of the information age. Observing the convergence of the Internet and mobile communications, industry futurists speculate that the most common personal computer of the next decade will be the digital wireless phone. This vision is quickly becoming reality in Canada.

BWA members have demonstrated technology leadership through the delivery of enhanced voice and data solutions designed to increase the productivity of our customers and business partners. BWA's services are unparalleled in giving Canadians the ability to connect with anyone, anywhere, anytime of day. Reflecting this, Bell Mobility is one of the few companies in the world with expertise across the full spectrum of wireless services. This expertise is sought after globally and positions it as an exporter of Canadian wireless know-how.

The BWA's members were the first in Canada to upgrade their extensive analog cellular networks to IS91A and CDPD in order to offer enhanced services such as caller ID, Short Message Service and data services to most of their customer base, not just to those located in larger metropolitan markets. From the initial introduction of PCS in the 2 GHz range, service enhancements beyond that of traditional cellular service were evident. Significantly enhanced voice transmission quality as well as privacy of communications, extended talk and stand-by battery life and enhanced user control features, such as caller ID, set new standards in mobile wireless communications. The most exciting service innovations, however, are now appearing in the shape of wireless data innovations. The Internet has changed the world of communications and initiatives by BWA members are embracing that change. The BWA predicts that the convergence of the Internet and wireless technology will produce synergies which will unleash powerful new communications and information alternatives for Canadians. Even more important is the fact that these service innovations are already beginning to appear in the marketplace.

In May 1999, Bell Mobility introduced Canada's first full suite of innovative wireless data services in the form of Digital Data to Go. The service enhances personal productivity by making wireless on-line banking, real-time e-mail and web browsing available. Digital Data to Go offers a full suite of applications to business users by providing continuous access to corporate resources such as e-mail, schedules and files through data links to corporate Intranets and the Internet.

1999 also saw the introduction of North America's first PCS Mobile Browser. Mobile Browser enables anywhere, anytime Internet access to e-mail and a range of real-time lifestyle information such as e-commerce, weather reports, stock quotations, news headlines and web-based 411 directory services.

Not only are we keeping our customers in touch with information with Mobile Browser, but we are also committed to working in partnership with our corporate accounts to develop custom applications that enhance their existing services for their customers. Through strategic partnerships, we have worked with a number of leading financial institutions in the development of new innovative wireless financial services that address the mobile needs of their clients.

In November 1999, SaskTel Mobility announced the commercial availability of Lightning Mobile Commerce, using technology developed by Soft Tracks Enterprises. Soft Tracks is a Vancouver based company that provides wireless electronic commerce systems for Canadian telecommunications companies, banks and businesses. Lightning Mobile Commerce provides secure credit and debit card transactions through portable handheld sets to be used in business-to-business sales and service, food delivery, taxi services and other similar industries.

In partnership with Schwab Canada, Bell Mobility introduced the first wireless stock quote directory and on-line trading service. With both the stock market and their clients on the move, the melding of the Internet and PCS technology have provided Schwab's customers with the ability to stay in touch with their investments, without being restricted to watching their computer screens or constantly checking with their brokers.

In addition to trading, Bell Mobility has invested in the development of the first wireless banking application to be launched in North America with the Bank of Montreal and a Canadian software developer, 724 Solutions. This application provides the level of service that consumers have come to expect: immediate and integrated access to the information they care about.

Most recently, in early 2000, the BWA demonstrated even further the accelerating convergence of the Internet and wireless technology with exciting service innovations. The first of these saw BWA customers become the first to gain wireless access to Yahoo! Canada – one of the most popular Web sites in the country. Yahoo! Everywhere, as the service is branded, is an indication of the BWA's commitment, not only to the concept of service innovation in the 2 GHz range, but also to the delivery of those innovations to customers.

A second innovation, also early in 2000, was the BWA's launch of the first wireless on-line shopping service in Canada. Using the Mobile Browser feature, and beginning in Bell Mobility's service area, BWA customers have wireless access to Amazon.com. The service enables wireless customers to browse Amazon.com's extensive selection of merchandise and, using 1-Click purchasing capability

through a secure web-site, to place orders from their wireless phones. The BWA's members also offer a range of ".com-ready" digital PCS phones available to support these applications.

In another world-first in December 1999, BWA member Bell Mobility introduced the first "wireless campus" for Nortel Networks at two of its sites, one in Montreal and the other in Nortel's Ottawa complex. The concept begins to simplify users' lives – and make anywhere, anytime communications a reality – by making a digital PCS phone a user's only service. While still providing access to Nortel's corporate telecommunications infrastructure, the wireless campus literally unleashes employees from their work stations while at the same time ensuring that they remain in-touch.

On a broader note, and in recognition of its commitment to Canadian wireless ingenuity, in November 1999 the Bell Wireless Alliance and TELUS Mobility provided nearly \$1.7 million to companies in Alberta, B. C., Quebec, Ontario, Nova Scotia, and Newfoundland as part of a \$6 million wireless telecommunications R&D initiative being rolled out across Canada.

In partnership with the Canadian Network for the Advancement of Research, Industry and Education (CANARIE), the program was launched one year ago with funding provided by the Bell Wireless Alliance and TELUS Mobility. The program targets emerging Canadian companies engaged in innovative research and development projects having the potential to provide leading edge products and services to the wireless marketplace. The types of investment include such diverse areas as electronic commerce, telehealth, asset management, hardware development, security monitoring and office management. Under the first phase of this multi-year initiative, the program will provide funding to nine companies across Canada.

On the global front, Bell Mobility provides leadership in the Operators Harmonization Group (OHG) to promote 3G systems and their standardization. The OHG has representation from over 40 service operators providing service worldwide.

3.1.4 Competitiveness of the Canadian Wireless Market

Clearly, the Department has achieved its policy objectives of increased consumer choice at lower cost accompanied with vigorous service innovation. Inherent in the Department's 1995 policy was a fundamental belief that competitive market forces would be significant in achieving the desired policy objectives. By any measure, the Canadian wireless industry is competitive. Many telecommunications industry observers note that the North American wireless market, including the Canadian portion, is the most competitive segment of the telecommunications market. Likewise, the Yankee Group's June 1999 study noted that, "The Canadian Wireless Market can only be described as being highly competitive."

The competitiveness of the Canadian wireless market has also been extensively considered by the CRTC. In a 1996 letter decision concerning the distribution of Liberti cell phones, the CRTC found, at page 5, that:

The Commission notes . . . that the provision of cellular services has evolved considerably since 1992. Consumers now have a greater awareness of competitive alternatives and of competition in telecommunications services in general. Cellular products and services are more consumer-oriented and are widely available through mainstream retail outlets, as well as through specialized dealerships The Commission also notes that other wireless services, such as ESMR and PCS, have been, or soon will be, introduced in Ontario and Quebec, and LMCS licences have been issued. As a result, the market for cellular services is becoming increasingly competitive.

One month later, in *Regulation of Mobile Wireless Telecommunications Services*, Telecom Decision CRTC 96-14, December 1996, after an extensive review of the competitiveness of the wireless market in Canada, the CRTC found it to be sufficiently competitive so as to warrant forbearance in virtually all areas, including prices for wireless services.

It is appropriate that the Department acknowledges, in its consultation paper, that the introduction of new players could very well splinter and weaken the mobile wireless industry. The BWA notes for example that, in submissions to the CRTC in 1996, Rogers AT&T noted that it had yet to turn a profit in the Canadian wireless market after 11 years of operation. Similarly, the new PCS entrants are struggling under the burden of capital intensive network builds and Bell Mobility saw its net income decrease from \$70M to \$0.2 M (1998/1997) attributable primarily to the dramatic increase in competition in the wireless market. In addition, incumbent cellular providers, as well as being faced with dramatic price discounting, are also incurring large capital expenditures to digitize their 800 MHz networks. Circumstances in the Canadian wireless industry resulted in Canadian carriers posting, overall, a \$1 billion net loss in 1998 and the industry is likely to repeat this result in 1999.

The reaction of the capital markets, prompted by the release of the Department's Spectrum Cap decision in November 1999, is also illuminating in this regard.

Merrill Lynch, for example, in *Canadian Wireless – Spectrum Cap Policy 21: A Closer Look*, November 10, 1999 noted that:

... Industry Canada is seeking to stimulate investment and growth in the industry, not to maximize auction proceeds or more competition per se. Its policy objectives, articulated in the [Spectrum Cap] policy paper, include the stimulation of competitive choice, infrastructure

development, service innovation, jobs and investment (The paper also notes that the Canadian market is characterized by intense price competition but relatively low penetration, which suggests that the goal should be to stimulate more investment, rather than more competition.)

[bracketed comments included in the original]

Discussing the competitive implications of the proposed licensing policy, the Merrill Lynch analysis further notes that:

1. It is highly likely that a fifth competitor will be licenced.¹
2. It is theoretically possible that two new operators will be licenced (e.g. each with 20 MHz of spectrum), but unlikely, given how valuable extra spectrum would be to an established operator, and the policy/investment risks of creating this much additional competition. (emphasis added.)

Mobility Canada's dissolution has already increased the number of service providers from four to five. Given the relatively small size and geographically dispersed make-up of the Canadian wireless market, the BWA believes that the introduction of a new, sixth service provider would splinter the market and jeopardize the competitive health of the industry to the detriment of all Canadians.

3.2 *In addition, the Department would be interested in any views as to whether a certain amount of spectrum should be identified for which only new entrants would be eligible to bid. Those supporting such a view should stipulate the amount of spectrum that should be reserved and indicate how such provisions would be in the public interest.*

As noted above, the industry fundamentals suggest that the market cannot sustain more service providers and remain healthy. Hence, there is no need for set-asides. Even if, however, the Department was to decide to allow further entrants, then there should not be any set-asides. In the BWA's view, set-asides create inappropriate imbalances in what is widely considered to be a highly competitive marketplace.

3.3 *Furthermore, the Department invites comments as to how it should view the potential eligibility of any party that is licenced for the provision of personal communication services under the Radiocommunication Act but is not in compliance with its existing licence conditions. Specifically, the Department requests views as to whether such parties (and their affiliates) should be required to be compliant with existing PCS licence conditions before being eligible to acquire additional spectrum.*

¹ As noted, the Mobility Canada dissolution has already produced a "fifth" competitor.

The Department has requested views as to whether parties licenced for the provision of PCS, but who are not in compliance with their existing licence conditions, should be required to be compliant with the existing conditions before being eligible to acquire additional spectrum.

The BWA's belief is that all existing PCS licensees are in compliance with their existing conditions of licence. Therefore, there might well not be a requirement to link compliance with eligibility to participate for the purposes of this auction.

However, if and when the Department decides to create some linkage between licence compliance and eligibility to participate in an auction, the BWA strongly encourages the Department to undertake a separate public consultation to consider the appropriate linkages and the public process that would be required in order to determine whether a potential auction participant should be disqualified because of non-compliance with conditions of licence.

There are a number of issues the BWA believes merit a full airing before the Department establishes any linkages between compliance and eligibility. These include the following:

- the character of the public process that would be followed to determine a carrier's state of compliance and eligibility; and
- the appropriate definition of substantively non-compliant.

3.4 *Finally, the Department solicits input on any other factors that respondents believe are relevant to the eligibility of entities to participate in the auction.*

The wireless industry globally, as well as in Canada, is highly challenging. Capital investment required to participate in the Canadian market is measured in the billions of dollars. The industry is based on state-of-the-art technology and requires highly competent business and technical expertise. Further, the Canadian wireless market is intensely competitive.

As noted previously, the BWA does not believe that allowing new entrants to participate in the auction would be in the public interest. However, the BWA submits that to be considered eligible to participate in the auction, potential entities should also be required to demonstrate to the Department that it has sufficient financial resources, as well as the technical know-how and managerial capability to acquire and successfully operate this significant public resource. The BWA notes that the post-auction business failures of a number of successful bidders in the FCC auctions demonstrates the need for such qualification guidelines.

4. DEFINITION OF LICENCES

4.1 Spectrum Structure

Based on these factors, the Department seeks comments on:

- (i) the minimum size of frequency sub-blocks that would support practical implementation of 2G and initial deployment of 3G (IMT-2000) services, given the frequency block size of the C/C' and E/E' blocks;*

The minimum size of frequency sub-blocks that would support practical implementation of 2G and initial deployment of 3G (IMT-2000) is 10 MHz (2 x 5 MHz). This size will, as a minimum, provide an operator with the ability to deploy at least one carrier of DS CDMA, as envisaged by the ITU's proposed IMT 2000 standards.

- (ii) the preferred sub-block structure of the spectrum in the C/C' and E/E' blocks, taking into account engineering issues, business factors, and the Department's desire to see greater competition and advanced services in all regions of Canada;*

The BWA's assessment of the possible effects of the subdivision of the PCS spectrum blocks C and E on implementation of the PCS CDMA network (IS-95 and IMT-2000) are detailed in Appendix A.

The BWA's recommended spectrum structure is 4 x 10 MHz licenced on a national basis. The BWA believes that this solution allows for maximum flexibility in enabling the maximum number of incumbent service providers to bid for additional spectrum if they so desire.

It is our view that this sub-block arrangement meets the requirements of all existing 2G (CDMA, TDMA, GSM) as well as planned 3 G technologies.

- (iii) the implications on roaming and cross-border sharing arrangements of the subdivision of the C/C' and E/E' blocks;*

The BWA's preferred solution of 4 x 10 MHz blocks can be accommodated in the roaming arrangement in wireless handsets.

- (iv) the technical challenges that would exist in the context of 2G deployment, initial 3G deployment, and the anticipated evolution from 2G to 3G.*

Assuming the recommended spectrum structure, BWA does not anticipate any significant technical challenges in evolving current 2G technology to anticipated 3G standards.. In the cdmaOne technology, currently deployed by the BWA, the

evolution to 3G technology multi-carrier CDMA (Phase1) can fit into existing spectrum where there is capacity or can be overlaid. The next stage will require careful planning and will require additional spectrum in specific regions. The BWA expects that this additional spectrum will become available from the 2110 – 2150 MHz which is currently unallocated and is being addressed in World Radio Conference (WRC) 2000.

Further factors also need to be considered if a sub-division of the C/C' and E/E' blocks is envisaged, such as the need for paired, symmetrical frequency blocks. As cellular/PCS networks address growing requirements to offer multimedia and Internet protocol based (IP-based) services, there may be a need to address asymmetrical traffic flows. The asymmetry in the data flow between the forward and reverse paths may necessitate the establishment of asymmetrical paired blocks for Frequency Division Duplexing (FDD).

Therefore, the Department seeks additional comments on:

- *the need for operators to have contiguous spectrum blocks in the band 1850-1990 MHz, given the wide range of access technologies available to operators for both 2G and 3G applications;*
- *the need, if any, to adjust the spectrum block structure to align with asymmetrical traffic flows, taking into account the growing developments in IP-based services over cellular/PCS systems; and*
- *the need for special provisions to accommodate Time Division Duplexing (TDD) technology in the frequency block structure.*

It is too early to decide on the question of symmetrical vs. asymmetrical traffic patterns at this stage. The current standards do not address the question of symmetrical and asymmetrical traffic patterns. Further, initial deployment of wireless data services is just beginning to give operators experience with and an understanding of the associated traffic patterns. The BWA recommends that Industry Canada not consider asymmetrical traffic patterns at this time. A better assessment of this issue can probably be made in 2002.

As for TDD, the existing unlicensed PCS adequately addresses the current needs. It is our view that no special provisions are required at this stage for TDD technology in the frequency block structure. However, this question can be addressed through an SRSP when TDD standards, being developed by 3GPP, become available in 2003.

4.2 Geographic Dimension of Licences for Spectrum in Blocks 'C' and 'E'

4.2.1 *Within the context of the eligibility issues discussed in section 3.2, the Department seeks comment as to whether national spectrum blocks, regional spectrum blocks, or a combination of both would be appropriate.*

The BWA strongly recommends that the remaining 40 MHz of PCS should be allocated as national spectrum blocks. BWA notes that, other than the former Mobility Canada licensees, Rogers Wireless, Clearnet and Microcell each have national licences. Moreover, as the Department notes in its consultation paper, even the Mobility Canada authorizations have been effectively operated as national licences.

The character of many of the most powerful new wireless services, which are currently under development, points to a trend which will only intensify, namely, the delivery of services on a national basis. One of the principal benefits of wireless communications services is the mobility, which such services provide to users. A service provider's ability to provide access to its services throughout its served territory will increasingly rely upon its ability to utilize nationally allocated spectrum. Tomorrow's feature rich and high bandwidth services will require access to spectrum on a national basis. The BWA also notes that a national rollout requirement would substantially support the government's connectedness agenda for all regions of the country.

4.2.2 With reference to section 3.2 [of the consultation paper], the Department also seeks comment on the following issues:

- If regional PCS licensees previously under the former Mobility Canada consortium were eligible to bid for additional spectrum to expand their coverage beyond their present serving areas, would it be desirable as a public policy to require them to serve all regions of Canada? If such a policy were desirable, how might this objective be achieved?

The BWA submits that former members of Mobility Canada should be eligible to bid for additional spectrum to expand coverage beyond their present serving areas. With the dissolution of Mobility Canada, the former members of Mobility Canada have now established two groups namely, the Bell Wireless Alliance and TELUS. The stated intention of each group is to offer wireless services on a national basis. Through inter-carrier sale and roaming agreements the former Mobility Canada members are now beginning to compete beyond their present serving areas. While these agreements respond to the need to roll out service beyond traditional service territories quickly, these entities require spectrum in order to engage in facilities-based competition and to develop their own new competitive services.

Allowing the former Mobility Canada members to acquire spectrum and to expand their present coverage areas would facilitate the development of a more vigorous and robust degree of wireless competition. A key *raison d'être* of the Mobility Alliance was to respond to the needs of national customers, and as the consultation paper notes, Mobility Canada operated essentially as a national licensee in this regard. In BWA's view, it would be both appropriate and in the best interests of Canadian wireless consumers, for former Mobility Canada members to be eligible

to acquire PCS spectrum beyond their present serving areas.

As noted above, the BWA believes that the remaining PCS spectrum should be authorized as national licences. This would imply that all successful bidders, including former members of Mobility Canada, should be required to serve all regions of Canada as defined by Industry Canada within a reasonable period of time, e.g., five years from the date of licence authorization. This requirement, to be fair to incumbents, should take into consideration a successful bidder's existing spectrum as well as that spectrum acquired in the auction.

Establishing appropriate conditions of licence would ensure that the objective of serving all regions is achieved.

4.2.3 If spectrum were identified specifically for new entrants, would it be desirable that they be required to serve all regions of Canada? If such a policy were desirable, how might this objective be achieved?

The BWA does not believe that it would be in the public interest, for the reasons outlined above, to licence new entrants. However, if new entrants were licenced, the BWA believes that conditions of licence must be fair and equitable between incumbents and any new licensee(s). It cannot be ignored, for example, that all incumbents are effectively subject to national rollout requirements and the BWA's view is that the remaining PCS spectrum should be authorized as national licences with applicable roll out requirements.

4.2.4 If new entrants were eligible to participate in the auction but with no spectrum specifically identified for them, would it be desirable that they be required to serve all regions of Canada? If such a policy were desirable, how might this objective be achieved?

See above response. However, if a new entrant was licenced nationally, then the same conditions of licence should apply as currently exist for current players who are required to provide service nationally. Such a policy objective could be achieved through establishing appropriate conditions of licence.

4.3 Displacement of Microwave Incumbents

Industry Canada seeks comments on accelerating the existing transition provisions for all licenced PCS spectrum (1850-1910/1930-1990 MHz) so that Canadians, wherever they live, can benefit from new PCS services over a relatively short implementation period. The Department proposes the following:

(i) As of January 1, 2001, all fixed frequency assignments subject to displacement will be afforded a minimum of a two-year notification period.

(ii) Fixed microwave operators will have to file with the Department by January 1, 2001 their plans to migrate their fixed service operations to other frequency bands (in particular for high market areas and in the vicinity of major highways), and be able to accommodate a transition over a one-year notification period.

(iii) As of January 1, 2002, all fixed frequency assignments will be afforded a minimum of a one-year notification period.

(iv) Starting on January 1, 2002, the Department may establish geographic areas and serve notification that fixed frequency assignments in these areas must cease operation within one year.

The major tenets of the *Spectrum Transition Policy* in the 1995 PCS policy and the displacement procedures specified in the Department's CPC-2-1-09 and CPC-2-1-20 circulars could be summarized as follows:

- The transition provisions outline a "where necessary" displacement approach which links the relocation of fixed stations to the PCS and LE-PCS service implementation and spectrum requirements
- The displacement of specific frequency assignments of fixed stations by PCS and LE-PCS systems will be based on if PCS and LE-PCS systems are intended to be implemented within the interference range of such fixed stations, as determined by TIA Bulletin 10-F or other mutually acceptable method.

It should be noted that the FCC has similar tenets in its rules for the displacement of fixed stations by PCS and unlicensed PCS systems, excepting the provisions for displacement costs.

The BWA agrees with the Department's assessment that the transition provisions for the displacement of fixed microwave systems have worked well in the early introduction of PCS service. Although a large number of fixed frequency assignments in larger urban areas and some major highways have been displaced since the transition policy was announced, some wireline carriers still have a significant number of fixed stations, particularly in rural and remote areas where the PCS service providers currently do not have any plans to provide service. Such fixed stations in rural and remote locations constitute a critical component of the Canadian telecommunications infrastructure, which enables Canadians in rural and remote locations to be connected for both work and leisure. Therefore, it is important to retain the above two tenets in any revision to the transition policy.

It should be noted that the PCS licensing policies in both Canada and the US provide service flexibility, thus allowing the provision of PCS services in both mobile service and fixed service modes. Therefore, the text in the second paragraph on page 13 which reads as follows:

...that the secondary status of the fixed service became effective on July 1, 1997 (footnote C35)...

is not accurate. A more appropriate text would be as follows:

... that the fixed service stations became subject to displacement effective on July 1, 1997 (footnote C35)...

The BWA agrees with the Department's assessment that "in the next two to four years, wireless PCS capability promises to evolve as a significant high-speed data access component with a rich level of services based on the Internet, including e-commerce".

The BWA also agrees that the notification period for the displacement of fixed assignments in certain situations could be reduced. With these general comments, the BWA offers these comments on the Department's proposals:

- (i) ***As of January 1, 2001, all fixed frequency assignments subject to displacement will be afforded a minimum of a two-year notification period.***

The BWA supports this proposal, subject to the understanding that the term 'frequency assignments subject to displacement' refers to fixed systems which interfere with the service implementation plans of a known PCS licensee.

- (ii) ***Fixed microwave operators will have to file with the Department by January 1, 2001 their plans to migrate their fixed service operations to other frequency bands (in particular for high market areas and in the vicinity of major highways), and be able to accommodate a transition over a one-year notification period.***

It should be noted that the majority of existing fixed microwave stations are located in rural and remote areas. In view of the anticipated retention of the "where necessary" approach in the revised transition policy, this proposal for filing plans on migrating to other frequency bands would create unnecessary work for operators with fixed stations located in rural and remote locations, which may not be subject to displacement in the near future. For other locations in larger market areas and in the vicinity of major highways, proposals #3 and #4 below would be adequate. In addition, BWA is aware that one telephone company has filed plans with the CRTC for the replacement of their remaining 2 GHz fixed stations over the years 2001 to 2004. The CRTC's decision, in that process, may not be known early enough to enable that company to meet the Department's January 1, 2001 proposed date.

In view of the above reasons this proposal is not supported by the BWA.

(iii) As of January 1, 2002, all fixed frequency assignments will be afforded a minimum of a one-year notification period.

In light of the anticipated retention of the above two tenets in a revised transition policy, some fixed frequency assignments may not be subject to displacement. Also, exception should be made for fixed stations in rural and remote areas, which may require a longer notification period for displacement, in view of the likely unavailability of adequate alternate facilities for route diversity considerations.

Therefore, it is recommended that this proposal should be modified as:

“As of January 1, 2002, all frequency assignments subject to displacement and located in high market areas or in the vicinity of major highways will be afforded a minimum of a one-year notification period. All other fixed stations subject to displacement and located in rural/remote areas, will be afforded a minimum of a two-year notification period.”

(iv) Starting on January 1, 2002, the Department may establish geographic areas and serve notification that fixed frequency assignments in these areas must cease operation within one year.

The BWA supports this proposal on the basis that the Department will not include fixed stations in rural/remote locations in such geographic areas.

- In April 1997, the Department issued Spectrum Utilization Policy 1910 MHz (SP 1910 MHz), entitled Licence Exempt Personal Communications Services in the Frequency Band 1910-1930 MHz. The provisions of the transition policy are summarized as follows:

- a minimum notification period of two years for the displacement of a fixed station frequency assignment to accommodate non-nomadic PCS devices;

- a minimum notification period of three years for the displacement of fixed station frequency assignments across the country to accommodate nomadic PCS devices.

The Department also seeks comment on whether it would be appropriate, and to what extent, that similar accelerated provisions apply to the licence-exempt PCS spectrum in the sub-band 1910-1930 MHz.

The procedures for the displacement of fixed stations, whether caused by the implementation of a PCS service or by the implementation of non-nomadic LE-PCS devices, are similar in nature, since in either case it involves the provision of the designated service within a defined service area of limited size. As the implementation of non-nomadic LE-PCS devices is not seen to be nearly as

complex as the implementation of a PCS service, the accelerated transition provisions for the PCS case in proposal #1 and #3 above would be adequate for the displacement of fixed stations by non-nomadic LE-PCS devices. Therefore, the transition provisions for fixed stations for accommodating non-nomadic LE-PCS devices are stated as follows:

- As of January 1, 2001, all fixed frequency assignments subject to displacement will be afforded a minimum of a two-year notification period.

Note: The term 'frequency assignments subject to displacement' refers to fixed systems which interfere with the service implementation plans of non-nomadic LE-PCS devices.

- As of January 1, 2002, all frequency assignments subject to displacement and located in high market areas will be afforded a minimum of a one-year notification period. All other fixed stations subject to displacement and located in rural/remote areas will be afforded a minimum of a two-year notification period.

However, in accordance with the agreements reached within the Industry Advisory Group (IAG) for LE-PCS, such displacement should only take place after a frequency coordination process is determined to be unsuccessful between the potentially affected fixed microwave stations and a proposed LE-PCS system.

The implementation of nomadic LE-PCS devices would normally require a country-wide displacement of all fixed frequency assignments within the 1910-1930 MHz LE-PCS band. Since such an implementation has not taken place in the US, it would be difficult to initiate the nomadic implementation in Canada first, because of cross-border coordination issues with the US fixed microwave stations. Furthermore, there are still about 200 microwave systems operating in the LE-PCS band in rural and remote areas of Canada. These facilities provide the only link to telecommunications for the public in these areas. An implementation of band clearing to accommodate nomadic LE-PCS implementation in Canada will cause significant relocation costs to be incurred.

In the US the PCS licensees as well as UTAM (for unlicensed PCS) are not obligated to pay relocation costs for fixed stations after the relocation rules sunset. Also, the notification period for the displacement of fixed stations is reduced to six months after the rules sunset. Although the sunset date is not clearly specified in any FCC rule, it is understood that the designated date will be April 4, 2005, as stated in its First Report and Order FCC 96-196 (released April 30, 1996). Since the nomadic devices are expected to be less costly in comparison to non-nomadic devices, it is anticipated that the US nomadic market could ramp up very quickly as the sunset date is reached. Therefore, in order to reduce the time lag for the implementation of nomadic LE-PCS devices in Canada, it is desirable that IC establish a transition provision with a mandatory displacement date as follows:

- The earliest mandatory date for fixed frequency assignments that may be subject to displacement will be October 1, 2005 to accommodate nomadic LE-PCS devices. This date could be subject to change based on nomadic unlicensed PCS implementation in the US. Industry Canada will provide incumbent microwave operators with as much advance notice as possible. In principle however, all frequency assignments subject to displacement will be afforded a minimum of a one-year notification period. Most nomadic LE-PCS implementation will initially take place in urban and high market areas while most fixed station assignments subject to displacement will be located in rural and remote areas. Consequently, fixed stations located in rural and remote areas may elect to continue operation after the one-year notification period, subject to not claiming protection from interference caused by nomadic LE-PCS devices. However, if it is determined by the Department that a fixed station transmit assignment is limiting the implementation of nomadic LE-PCS, Industry Canada will take steps to remove the interference to the nomadic LE-PCS device(s).
- A displacement date earlier than that afforded by the minimum one-year notification period noted above may be achieved through mutually acceptable arrangements between the LE-PCS vendor(s)/supplier(s) and the affected fixed station operator(s).

While the BWA supports a shortened notice period it continues to support the Department's earlier policy of monitoring LE-PCS suppliers product and marketing plans to insure that microwave systems are not displaced unnecessarily.

4.4 Licence Tenure

The BWA fully supports the Department's proposal that licences have a ten-year term and a high expectation of renewal at the end of the term.

4.5 Transferability and Divisibility

The BWA fully supports the transferability and divisibility of auctioned licences, subject to the guidelines specified in Section 4.6 of the Consultation paper, in the spectral and/or bandwidth dimensions.

5. TECHNICAL CONSIDERATIONS

The BWA fully supports current technical standards SRSP-510 and RSS-133, as meeting the industry's needs in the immediate future.

6. CONDITIONS OF LICENCE

The Department proposes and seeks comment on the following conditions of licence.

In the following sections, the BWA has restricted its response to those proposals on which it has specific comments. The absence of comments on a proposal should be interpreted as concurrence with the Department's proposal as outlined in the Consultation paper.

6.1 Licence Conditions for the Spectrum in the 'C' and 'E' Blocks for all Licensees

6.1.1 Spectrum Aggregation Limit

At the outset, the BWA notes that it continues to adhere to the views expressed in Mobility Canada's January 1999 submission in response to the Department's *Review of the Spectrum Cap applied to Providers of Personal Communications Services, Canada Gazette – Part 1, Notice No. DGTP-015-98*. The key point of Mobility Canada's submission was that there is no need for a spectrum cap since the intended aims of the policy are already evident in the Canadian wireless market. The BWA also notes that the Radio Advisory Board of Canada (RABC), in the majority, also supported the removal of the spectrum cap in its submission in response to the Department's consultation on that issue.

However, given that the result of the above review was a decision to retain a modified (i.e. increased) spectrum cap, BWA acknowledges the spectrum aggregation limit proposed in the Consultation paper.

6.1.2 Radio Station Installations

The BWA fully supports the process outlined. Bell Mobility in conjunction with the CWTA developed the methodology and tools for calculating Safety Code 6 requirements. This tool, RaPD-Calc (Radio frequency Power Density Calculation), allows calculations to be made for RF emission for each cell site taking into account all transmitters at that site. This requires that operators who are sharing sites cooperate in determining RF emission levels. The BWA also recommends that, should there be any, new entrants must be obliged to support the RaPD-Calc tool.

We also anticipate that Industry Canada will make every effort to support applications to set up new cell sites. This support could be in the form of satisfying the land authorities that the new cell site meets all safety requirements, including Safety Code 6, as well as related regulatory requirements.

6.1.3 Technical Considerations

The BWA will comply with the technical requirements set forth in SRSP-510, and will only deploy equipment certified under RSS-133 and SRSP-510. BWA believes that a review will be required of RSS-133 and SRSP-510 after IMT 2000 standards are published by the International Telecommunications Union (ITU). This review will be required after Q3 2000.

6.2 Licence Conditions for the Spectrum in the 'C' and 'E' Blocks for Radiocommunications Carriers

6.2.1 Lawful Intercept

BWA supports the proposed Lawful Intercept condition under the assumption that the lawful intercept functionality will be supported under a self-funding environment, and that future development of the service will be aligned with North American industry standards.

6.2.2 Research and Development

The allocation of spectrum by auction is a fundamental change in the approach to assigning spectrum rights in Canada. Unlike the Department's Comparative Licensing process, which is essentially an administrative process, auctions represent a market-based approach to the allocation of spectrum. As the Department noted, at page 7, of its *Consultation on Issues Related to Spectrum Auctioning*, August 1997:

...Auctions substitute real world investors and consumers for public servants in the determination of who has the better business plan, the most innovative ideas, the most highly beneficial services, the right technology and the best management team.

Auctions capture appropriate economic rents for the public for the use of its spectrum resources. Furthermore, the required payments established in an auction provide a built-in incentive to put spectrum to productive use in a timely manner and relieve the burden to police spectrum hoarding and speculation.

The BWA believes, for the reasons addressed below, that it is neither necessary nor appropriate for the Department to stipulate a Research and Development investment mandate for that spectrum which is awarded through auction.

The BWA submits that considerations, similar to those referenced above, suggest that the R&D requirement is redundant in today's wireless market. In this regard, the very competitiveness of the Canadian wireless market, as well as its close linkage to the US wireless market, drive R&D investment as part of a firm's

competitive strategy. Particularly in the wireless segment, innovation abounds, not as a result of government fiat, but rather as means of maintaining competitive advantage. The BWA believes that the same market discipline should be relied on to ensure that R&D is conducted in Canada.

The BWA also submits that the change in government policy, i.e. to allocate spectrum rights by auction thus applying an element of market discipline to the process, in and of itself warrants careful consideration of the appropriateness of an R&D mandate under those circumstances. As noted above, the public will capture appropriate economic rents for its spectrum resources as a result of the auction process. The BWA does not believe that it would be appropriate for government to attempt to extract even further “rent” in the form of a mandated R&D requirement, especially when that commitment, in and of itself, can be quite substantial. Therefore, the BWA recommends that the concept of an R&D mandate should be de-coupled from any spectrum that is acquired through auction.

In this regard, the BWA also notes that the proposed processes to track the R&D commitment, in the event of secondary market transfers, appears to be overly burdensome and onerous. The BWA submits that the proposed tracking process, in its complexity, demonstrates the inappropriateness of an R&D mandate in a market-driven allocation process. Should the final licensing policy include an R & D mandate, the BWA recommends that it be left to the parties involved in the transfer to negotiate the appropriate arrangements as part of their business discussions. This would include addressing both the responsibility for and manner of ensuring that previous and future R & D requirements are appropriately allocated among the parties to the transaction.

6.2.3 Annual Reporting

The BWA supports the annual reporting requirements but would recommend that service providers be permitted to consolidate all reporting associated with other spectrum licences it holds, e.g. cellular and current PCS.

7. LICENSING PROCESS AND AUCTION DESIGN

The Department seeks comments on the licensing process and auction design proposed below.

7.1.1 Discretionary Versus Non-discretionary Bidding

The Department seeks comment as to whether discretionary or non-discretionary bidding would be preferable.

The BWA supports the use of non-discretionary bidding.

7.1.2 Enforcement of Spectrum Aggregation Limits

The BWA supports retaining the existing flexibility to place bids and hold standing high bids on licences within a service area that would exceed the spectrum aggregation limit.

8. FINANCIAL ASPECTS

8.1 Opening Bids

Comments are sought on the absolute and relative level of opening bids.

As an alternative to the opening bids proposed by the Department, the BWA recommends a three-level schedule reflecting the relationship between population density and market value of spectrum as demonstrated in the results of the recent 24/38 GHz auction and the US PCS auctions.

Service Area Population	Points	Opening Bid
Less than 1M	1 to 10	\$10,000 per point
1M to 3M	10 to 30	\$50,000 per point
3M +	30+	\$100,000 per point

9. CONCLUSION

The BWA appreciates the opportunity to comment on the Department's proposals and looks forward to an expeditious release of the final licensing policy and the allocation of the remaining PCS at 2 GHz spectrum.

Appendix A

1. Introduction

The purpose of this document is to analyze the possible effects of alternative subdivisions of the PCS spectrum blocks C and E on the implementation of the PCS CDMA network (IS-95, IS-2000 and IMT-2000).

The subdivision of C block is analyzed in the following scenarios:

- Subdivision into three equal 2x5²MHz sub-blocks;
- Subdivision into two equal 2x7.5 MHz sub-blocs;
- Subdivision into two unequal sub-blocks 2x5 MHz and 2x10 MHz.

2. Current Canadian PCS Spectrum Allocation

The Canadian PCS band consists of six spectrum blocks. Blocks E (2x5MHz) and C (2x15MHz) are not licenced and are the subject of the upcoming PCS Spectrum auction anticipated for the Fall 2000 timeframe.

	Licensed						Unlicensed	Licensed																	
Channel numbers	0	299	300	399	400	699	700	799	800	899	900	1199		0	299	300	399	400	699	700	799	800	899	900	1199
	MTA		BTA		MTA		BTA		BTA		BTA			MTA		BTA		MTA		BTA		BTA			
Block	A		D		B		E		F		C			A		D		B		E		F		C	
Licence Holder	Microcell		Bell Mobility		Clearnet		Not Assigned		Cantel		Not Assigned			Microcell		Bell Mobility/N		Clearnet		Not Assigned		Cantel		Not Assigned	
Block bandwidth	15		5		15		5		5		15			15		5		15		5		5		15	
Frequency(MHz)	1850		1865		1870		1885		1890		1895		1910	1930		1945		1950		1965		1970		1975	
	Reverse Link (Mobile Transmit)												Data Voice	Forward Link (Base Station Transmit)											

Figure 1: Current Canadian PCS Spectrum Allocation

The purpose of this document is to consider the consequences of various spectrum subdivision alternatives on network implementation. If the proposed plan works for the CDMA technology, it will also fit other technologies such as TDMA 136 and GSM.

3. Analysis of Possible Subdivision of PCS C block

CDMA frequency assignments for the operation of IS-95 and IS-2000 equipment in the PCS band is defined in IS-95 and IS-2000 standards, as shown in the following tables:³

² In order to avoid any confusion, all references to the spectrum width in this document will be expressed in 2xYMHz, where Y is a bandwidth on the forward or reverse link.

³ Source: IS-2000-2, page 2-6.

**Table 1 CDMA Channel Numbers and Corresponding
Frequencies for Band Class 1 and Spreading Rate 1**

Block Designator	CDMA Channel Validity	CDMA Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
A (15 MHz)	Not Valid	0-24	1850.000-1851.200	1930.000-1931.200
	Valid	25-275	1851.250-1863.750	1931.250-1943.750
	Cond. Valid	276-299	1863.800-1864.950	1943.800-1944.950
D (5 MHz)	Cond. Valid	300-324	1865.000-1866.200	1945.000-1946.200
	Valid	325-375	1866.250-1868.750	1946.250-1948.750
	Cond. Valid	376-399	1868.800-1869.950	1948.800-1949.950
B (15 MHz)	Cond. Valid	400-424	1870.000-1871.200	1950.000-1951.200
	Valid	425-675	1871.250-1883.750	1951.250-1963.750
	Cond. Valid	676-699	1883.800-1884.950	1963.800-1964.950
E (5 MHz)	Cond. Valid	700-724	1885.000-1886.200	1965.000-1966.200
	Valid	725-775	1886.250-1888.750	1966.250-1968.750
	Cond. Valid	776-799	1888.800-1889.950	1968.800-1969.950
F (5 MHz)	Cond. Valid	800-824	1890.000-1891.200	1970.000-1971.200
	Valid	825-875	1891.250-1893.750	1971.250-1973.750
	Cond. Valid	876-899	1893.800-1894.950	1973.800-1974.950
C (15 MHz)	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-1175	1896.250-1908.750	1976.250-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

NOTE

Definitions:

“Valid” channels are CDMA channels, on which transmission is allowed to the licensee of the spectrum block to which these channels belong.

“Conditionally Valid” channels are CDMA channels, on which transmission is permissible if the adjacent block is allocated to the same licensee or if other valid authorization has been obtained.

“Not valid” channels are CDMA channels on which transmission is not allowed.

Based on that, preferred CDMA channel sets are defined in tables Table 2. and Table 3

Table 2 CDMA Preferred Set of Frequency Assignments for Band Class 1

Block Designator	Spreading Rate	Preferred Set Channel Numbers
A	1	25, 50, 75, 100, 125, 150, 175, 200, 225, 250, 275
	3	50, 75, 100, 125, 150, 175, 200, 225, 250
D	1	325, 350, 375
	3	350
B	1	425, 450, 475, 500, 525, 550, 575, 600, 625, 650, 675
	3	450, 475, 500, 525, 550, 575, 600, 625, 650
E	1	725, 750, 775
	3	750
F	1	825, 850, 875
	3	850
C	1	925, 950, 975, 1000, 1025, 1050, 1075, 1100, 1125, 1150, 1175
	3	950, 975, 1000, 1025, 1050, 1075, 1100, 1125, 1150

Table 3 Sync Channel Preferred Set of Frequency Assignments for Spreading Rate 3 MC for Band Class 1

Block Designator	Preferred Set of Channel Numbers
A	75, 150, 225
D	350
B	475, 550, 625
E	750
F	850
C	975, 1050, 1125

4. Analysis of Scenario A: C Block Subdivision into Three Equal Sub-Blocks

If the C block is divided into three sub-blocks C1, C2, C3 of 10 MHz each, then the following channel assignment would be possible:

Table 4 – Possible subdivision of the PCS C block into three equal sub-blocs

Block Designator	CDMA Channel Validity	Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
C1	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-975	1896.250-1898.750	1976.250-1978.750
	Cond. Valid	976-999	1898.800-1899.950	1978.800-1979.950
C2	Cond. Valid	1000-1024	1900.000-1901.200	1980.000-1981.200
	Valid	1025-1075	1901.250-1903.750	1981.250-1983.750
	Cond. Valid	1076-1099	1903.800-1904.950	1983.800-1984.950
C3	Cond. Valid	1100-1124	1905.000-1906.200	1985.000-1986.200
	Valid	1125-1175	1905.250-1908.750	1985.250-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

Table 5 – Referred CDMA channels for possible subdivision of the PCS C block into three equal parts

Block Designator	Spreading Rate	Preferred Set Channel Numbers
C1-A	1	925, 950, 975
	3	950
C2-A	1	1025, 1050, 1075
	3	1050
C3-A	1	1125, 1150, 1175
	3	1150

Based on this analysis, if C block is subdivided into three separate blocks, then each 2x5MHz sub-block could accommodate 3 CDMA channels with spreading rate 1 (equivalent to IS-95 and 1xRTT), or 1 CDMA channel with spreading rate 3 (equivalent to 3xRTT MC and W-CDMA).

Undivided C block could support total of 11 CDMA carriers, compared to 9 CDMA carriers if it is divided into three equal sub-blocks.

5. Analysis of Scenario B: C Block Subdivision into two Sub-Blocks

5.1 Alternative B1: 2x5MHz and 2x10MHz

If C block is divided into two unequal sub-blocks of 2x5MHz and 2x10MHz, then first sub-block would support three CDMA channels, while the larger sub-block would support seven CDMA channels.

In that case, sub-block assignment and preferred channels would be:

Table 6 – Possible subdivision of the PCS C block to 2x5 MHz and 2x10 MHz blocks

Block Designator	CDMA Channel Validity	Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
C1-B1	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-975	1896.250-1898.750	1976.250-1978.750
	Cond. Valid	976-999	1898.800-1899.950	1978.800-1979.950
C2-B1	Cond. Valid	1000-1024	1900.000-1901.200	1980.000-1981.200
	Valid	1025-1175	1901.250-1908.750	1981.250-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

Table 7 – Preferred CDMA channels for possible subdivision of the PCS C block to 2x5 MHz and 2x10 MHz blocks

Block Designator	Spreading Rate	Preferred Set Channel Numbers
C1-B1	1	925, 950, 975
	3	950
C2-B1	1	1025, 1050, 1075, 1100, 1125, 1150, 1175
	3	1050, 1075, 1100, 1150

5.2 Alternative B2: Subdivision of C blocks in 2 unequal blocks 2x10MHz and 2x5MHz

Table 8 – Possible subdivision of the PCS C block to 2x10MHz and 2x5MHz sub-blocks

Block Designator	CDMA Channel Validity	Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
C1-B2	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-1075	1896.250-1903.750	1976.250-1983.750
	Cond. Valid	1076-1099	1903.800-1904.950	1983.800-1984.950
C2-B2	Cond. Valid	1100-1124	1905.000-1906.200	1985.000-1986.200
	Valid	1125-1175	1905.250-1908.750	1985.250-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

Table 9 – Referred CDMA channels for possible subdivision of the PCS C block to 2x10MHz and 2x5MHz sub-blocks.

Block Designator	Spreading Rate	Preferred Set Channel Numbers
C1-B2	1	925, 950, 975, 1000, 1025, 1050, 1075
	3	950, 1000, 1050
C2-B2	1	1125, 1150, 1175
	3	1150

5.3 Alternative B3: Subdivision of C blocks into 2 equal blocks 2x7.5MHz

It is also possible to divide C block into two equal parts of 2x7.5MHz. In that case, CDMA channel assignment would be:

Table 10 – Possible subdivision of the PCS C block into two equal sub-blocks.

Block Designator	CDMA Channel Validity	Channel Number	Transmit Frequency Band (MHz)	
			Mobile Station	Base Station
C1-B3	Cond. Valid	900-924	1895.000-1896.200	1975.000-1976.200
	Valid	925-1025	1896.250-1901.250	1976.250-1983.750
	Cond. Valid	1026-1049	1901.300-1902.500	1981.300-1982.500
C2-B3	Cond. Valid	1050-1074	1902.500-1903.700	1982.500-1983.700
	Valid	1075-1175	1903.750-1908.750	1983.750-1988.750
	Not Valid	1176-1199	1908.800-1909.950	1988.800-1989.950

Table 11 – Referred CDMA channels for possible subdivision of the PCS C block into two equal parts.

Block Designator	Spreading Rate	Preferred Set Channel Numbers
C1-B3	1	925, 950, 975, 1000, 1025
	3	950, 975, 1000
C2-B3	1	1075, 1100, 1125, 1150, 1175
	3	1100, 1125, 1150

6. Conclusion

A CDMA licensee can operate a CDMA network in all three subdivisions of the PCS – C block analyzed in this document:

- Subdivision in into three equal 2x5⁴MHz sub-blocks (Alternative A);
- Subdivision in into two equal 2x7.5 MHz sub-blocks (Alternative B3);
- Subdivision in into two unequal sub-blocks 2x5 MHz and 2x10 MHz (Alternatives B1 and B2).

Block E should not be subdivided into smaller blocks.

⁴ In order to avoid any confusion, all references to the spectrum width in this document will be expressed in 2xYMhz, where Y is a bandwidth on the forward or reverse link.

Block C should not be subdivided into sub-blocks smaller than 2x5 MHz. However, by sub-dividing block C, more guard bands would be introduced, and total number of CDMA carriers deployable in C block would be reduced.

Eleven, spreading rate one⁵ (IS-95 or 1xRTT) CDMA channels can be deployed in the undivided C block. Ten, spreading rate one CDMA channels can be deployed in any variant of alternative B. Nine spreading rate one CDMA channels can be deployed in the alternative A.

CDMA operators in each block have to keep guard band to other blocks. That guard band is the same, regardless of the size of the block. Therefore, the number of CDMA carriers deployable in 20MHz (7 carriers) of continuous spectrum is more than two times higher than number of carriers in one 10 MHz block (3 carriers).

⁵ Spreading rate one CDMA technologies are IS-2000 (also known as 1xRTT) and IS-95. Spreading rate three CDMA technologies are CDMA-DS (also known as modified WCDMA) and CDMA-MC (Also known as modified cdma2000).