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Comments: Canada Gazette Notice DGRB-018-99

Consultation on the Proposed Policy and Licencing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range

March 1, 2000

"The prospect of one or more new mobile operators [versus four now] and the increased competition this will bring is good news both for U.K. consumers and the economy. Greater competition will spur the faster rollout of more innovative services, fresh approaches and cheaper prices." - Patricia Hewitt, UK minister for trade and industry, Wireless Week, January 21, 2000

"I'll have what she's having." – When Harry Met Sally, 1989

submitted by

A handwritten signature in black ink that reads "Joe Church". The signature is written in a cursive, flowing style.

Joe Church

1. INTRODUCTION

The following comments on the proposed PCS spectrum auction are the views of Joe Church.

I have personal experience with spectrum auctions, PCS licencing and cellular. I am President and founder of Wispra Networks Inc., the high bidder for broadband wireless licences in Canada's only spectrum auction held in 1999 (www.wispra.com). I was Chairman and founder of LanSer Personal Communications Services Inc., an unsuccessful bidder for a 30 MHz nationwide PCS licences in 1995. I was a Vice President of (then) Cantel Inc. during the start up of cellular in Canada in 1984 to 1986. Prior to that I had a long career in (now) BCE Inc., including Assistant Vice President of Bell Canada and Vice President of Bell Canada International.

2. BACKGROUND

On November 5, 1999, the Minister of Industry announced that:

- “the spectrum aggregation limit applying to personal communications services (PCS) would be raised from 40 MHz to 55 MHz, and
- 40 MHz of additional spectrum for PCS would be licenced by auction.

These actions were taken to ensure the availability of adequate spectrum resources:

- to meet the needs of the expanding PCS market and also
- to enable the implementation of new offerings such as third-generation (3G) PCS.

The PCS ‘C’ and ‘E’ frequency blocks are being made available for licencing on an exclusive basis In order to facilitate:

- the expansion and enhancement of existing personal communication services,
- the introduction of 3G PCS and/or
- the development of other new service offerings”

The focus of this announcement is the need to deal with the growth of cellular/PCS and the opportunities for new offerings such as 3G. It is interesting to look back on how cellular/PCS markets, technologies, carriers and licencing policies have changed since the original cellular licencing in 1983.

In 1983 two 25 MHz cellular licences at 800 MHz were awarded in each market. At that time the Department of Communications awarded the incumbent monopoly telephone carriers each 25 MHz of spectrum without a submission. Their only licence condition was to first allow interconnection to the new entrant, Cantel Cellular Radio Group Inc. (Cantel). Bell Canada alone was required to operate cellular as a separate subsidiary (since absorbed into Bell).

Cantel, the sole new entrant, won its nationwide licence in a competitive submission process against about five others based on its promised nationwide rollout, job creation, Canadian industrial benefits, etc. I find it interesting that Cantel projected a viable market for two competitors with a long run market potential for cellular of a mere 2% of the population. (I did the business plan.)

In 1995 Industry Canada offered 120 MHz of spectrum for Personal Communications Services (PCS) at 2 GHz band, also using a competitive submission process. Spectrum was divided into three blocks of 30 MHz and three of 10 MHz. This time there were two incumbents per market (Cantel and the telephone companies) who had only to apply to get 10 MHz each. Fortunately they were precluded from 30 MHz licences by the then 45 MHz spectrum cap.

11 new entrants filed submissions containing detailed business plans and commitments on network implementation, service innovation, investment, job creation, etc. At that time, PCS was viewed by many as something radically different than cellular. In 1995, LanSer projected a cellular/PCS long run market potential of 45% of population with five competitors per market. Incumbents and some competitors said the market wasn't big enough for five licencees. They likely still do.

Based on the submissions and other factors, Industry Canada awarded only two of three nationwide 30 MHz PCS licences, to Clearnet PCS Inc. and Microcell Networks Inc. The third 30 MHz licence (block 'C') and third 10 MHz licence (block 'E') were not awarded, although they had been proposed throughout the licencing process. LanSer Personal Communications Services Inc. and Telezone Inc. were among the companies that were not awarded the third 30 MHz licence. Telezone has undertaken legal proceedings relating to these events.

Reasons given by the Minister for licencing only four of the six available PCS spectrum blocks were that "his actions would promote a strong base from which to enhance competition in the provision of wireless telecommunication services. By reserving the remaining blocks, the Department provided an opportunity to respond to future innovations in a timely fashion." I never understood this.

Now in 2000 Industry Canada is proceeding to licence the previously withheld PCS spectrum by means of an auction. At this time, cellular/PCS penetration in at least one country (not Canada) is above 60% and projected to exceed 100%. Many others are now in the 30 to 40% range.

I consider the key objective for the current consultation to be how Industry Canada can structure the auction so that Canada joins the club of countries with high cellular/PCS penetration, high growth and more innovative services. The key policy issues are:

- who should be eligible for the spectrum: incumbents, new entrants, both?
- how should the spectrum blocks be: one 30 MHz and one 10 MHz, or four 10 MHz?

Key to both issues is how well the current competitive cellular/PCS structure has served Canada and what regime promises the greatest benefits in the future, in light of experience in other countries.

The following comments are respectfully provided using the chapter headings and subheadings contained in the request for comments.

3. SPECTRUM AGGREGATION LIMITS AND ELIGIBILITY TO ACQUIRE SPECTRUM

3.1 SPECTRUM AGGREGATION LIMITS

The incumbent cellular/PCS licencees received a major benefit when on November 5 1999¹ Industry Canada increased the spectrum cap for PCS-type spectrum from 45 MHz to 55 MHz per licencee in any service area (the “cap”). This is especially so when the FCC has recently reaffirmed its 45 MHz spectrum cap in the US for all non-rural service areas.²

This new Canadian cap is now large enough to allow all of the incumbents (see Table 3.1) to add at least one 10 MHz block in the current auction. It is also large enough to allow the merger of a 25 MHz cellular licencee with a 30 MHz PCS licencee (say Rogers AT&T Wireless with Microcell or ex-Mobility Canada with Clearnet) subject to Minister’s approval and divestiture of other spectrum.

Table 3.1: Spectrum Subject to the Cap by PCS Incumbent

Carrier	Cellular	SMR	PCS	Total
Ex-Mobility Canada	25 MHz	Some	10 MHz	35 MHz
Rogers AT&T	25 MHz	Some	10 MHz	35 MHz
Clearnet	-	Up to 15 MHz	30 MHz	Up to 45 MHz
Microcell	-	-	30 MHz	30 MHz

¹ Radio Systems Policy 021 (RP-021), *Revision to the PCS Spectrum Cap and Timing for Licencing Additional PCS Spectrum 3*, published

² Federal Communications Commission September 15, 1999, by Report and Order (FCC 99-244).

The size of the new 55 MHz cap is not a question in this proceeding but rather what spectrum the cap should apply to. Industry Canada has proposed the following definition for the cap:

- (a) "spectrum within the PCS band 1850-1990 MHz;
- (b) other spectrum that may be identified for PCS in subsequent proceedings;
- (c) spectrum licenced for cellular mobile radiotelephony services, and for similar public high-mobility radiotelephony services, other than air-to-ground telephony and mobile-satellite services;
- (d) spectrum as defined in (a), (b) and (c) above that is licenced to any affiliate of the entity; and
- (e) spectrum as defined in (a), (b) and (c) above that is licenced to any other entity which has an operating and/or marketing arrangement with the subject entity (or with any of its affiliates), in the same geographical area, for the provision of uniformly-branded or jointly offered telecommunications services."

The intent of the definition appears to include all spectrum for "public high-mobility radiotelephony services" (item (c)) including future spectrum under the IMTS-2000 and similar proceedings. But it does not quite say that. Item (b) only refers to future PCS spectrum. I am not aware of any future spectrum that will be called PCS. Future spectrum is more likely to be called third generation cellular (3G), IMTS-2000 or similar.

The United States has recently decided to propose that the 1710 to 1855 MHz and 2520 to 2690 MHz bands plus the existing cellular and PCS bands be used for third generation cellular on a worldwide basis¹. Whatever bands Canada chooses for 3G are unlikely to be called PCS.

To ensure that the spectrum cap applies to all terrestrial "public high mobility radiotelephony services" as appears to be the intent, I would request revision of items (b) and (c) as follows:

- "(b)other spectrum that may be identified for *public high mobility telephone services* in subsequent proceedings, including PCS, third generation cellular and IMTS-2000;
- (c) other than spectrum licenced for air-to-ground telephony and mobile-satellite services;"

¹ Finding a Home for 3G Services, Wireless Week, February 14, 2000.

3.2 ELIGIBILITY TO ACQUIRE SPECTRUM

The key questions posed by Industry Canada on eligibility are:

- should new entrants be eligible
- should the incumbents be eligible

Since, none of the four incumbents were eligible for any of the 'C' and 'E' block spectrum had it been awarded as originally proposed in 1995, I would like to propose that none of the four incumbents should be eligible now. However, given the preferred treatment given to incumbents in 1983 and in 1995, I expect that this may not occur.

An alternative approach would be to see if the performance of the four incumbents since 1995 has met the objectives set by Industry Canada to support their eligibility for some or all of the available spectrum.

Industry Canada justified withholding the spectrum in 1995 as follows:

“[we] authorized only two applicants for the 30 MHz spectrum blocks when three were available for licencing to :

- (a) ensure strong competition in the provision of wireless telecommunications services
- (b) increase consumer choice which leads to lower price and innovation in services
- (c) reserving the remaining block provides an opportunity in the future to reward innovation in services and technology”

Let's look at the results so far.

(a) Strong Competition

Restricting the number of competitors in 1995 has clearly benefited the licencees. Table 3.2a shows key statistics for each of the public cellular/PCS companies.

Public Cellular/PCS Company Key Statistics¹

Carrier	Market Value	Revenues	2 Year Share Price Ratio
Rogers AT&T ²	\$1.19 B	\$1.24 B	570%
Cleartnet ³	\$2.49 B	\$0.37 B	320%
Microcell	\$1.44 B	\$0.28 B	700%

Table 3.2a

Share prices have increased by 320% to 700% over the last two years alone. The market clearly values highly the position of the incumbents. I would be more than pleased to be any one of these incumbents facing possible new entrants in the upcoming auction.

“The Department’s most important objective is of course to see spectrum assigned so that Canadians may ultimately receive services⁴”. It should not be the job of Industry Canada to protect incumbents in a competitive market place.

Chart 3.2 shows that Canada has the lowest cellular/PCS penetration (except for Germany) among the G-7 countries. This substandard performance is projected to get worse in the foreseeable future with the current market structure. The Canadian penetration gap is projected to increase with all of the G-7 countries.

Strategis Group Inc. projects that in 2004 Canada will have cellular/PCS penetration of only 37% while the average of Western Europe will be 56%. Finland, the world leader, will have cellular/PCS penetration of 84%.

If we were to achieve even the performance of an average Western European country, we would have cellular/PCS penetration 1.5 times what is now projected. If we are to get better we need to change how the Canadian market operates. The most available tool for government is increased competition from new entrants.

¹ Toronto Stock Exchange, GlobelInvestors.com, February 28 2000

² includes cellular and PCS

³ includes PCS and ESMR (Mike)

⁴ Section 8.3

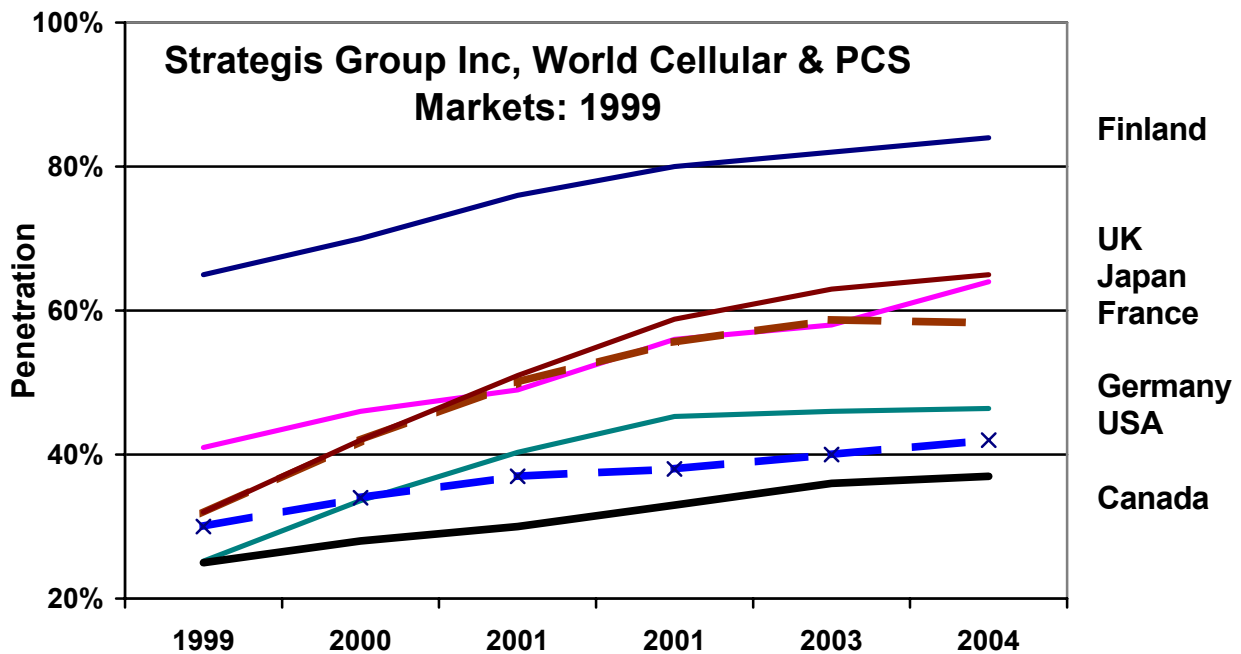


Chart 3.2

(b) Increased Consumer Choice, Lower Price, Innovation

Increased competition, by the addition of two new cellular/PCS entrants in 1995, has clearly increased customer choice, lowered prices and increased innovation versus having only two providers. The most visible benefit is that Canada has among the world's lowest prices for cellular/PCS. The most visible disbenefit of the current four player structure is Canada's low cellular/PCS penetration.

Would having had five Canadian cellular/PCS operators since 1995 have further increased consumer choice, lowered prices and increased innovation? I believe so, but we'll never know. Now Industry Canada has the opportunity to choose again. I hope they do it right.

(c) Reward Innovation

Should the four incumbents now have preferred or sole access to the withheld spectrum as their reward for demonstrated innovation in services and technology? I think not.

Alternatively, should the four incumbents be denied access to the remaining spectrum for lack of innovation in services and technology? Perhaps.

The key criterion for Industry Canada should not be one of rewarding incumbents but rather one of creating market conditions that will provide the greatest benefit to Canadians.

In my view innovation to date has been limited:

- The carriers formerly known as Mobility Canada (“ex-Mobility”) have deployed in their PCS spectrum the same IS-95 CDMA technology and services they deploy in the cellular band.
- Rogers AT&T Wireless (formerly Cantel) has deployed in its PCS spectrum the same IS-136 TDMA technology and services it deploys in its cellular band.
- Clearnet has deployed in its PCS spectrum the same IS-95 CDMA technology and services that ex-Mobility has deployed.
- Microcell has deployed in its PCS spectrum the PCS 1900 technology and services that have been deployed by the majority of carriers worldwide as DCS-1800 at 1.8 GHz and as GSM 900 at 900 MHz.

Customers are generally unaware of whether their calls are PCS or digital cellular, or perhaps even analog cellular. This is far less innovation than the images presented of mobile medicine, mobile video conference and more that I remember being promised in 1995. I suspect that some incumbents might argue today that all of this is still coming. All they need is more spectrum, new 2.5G and 3G technology and restricted competition extended for the foreseeable future. I don't think so.

If innovation in services and technology is truly a major objective of the Department, then ensuring that there are one or more new entrants as a result of the current proceeding is more likely to produce it than continuing to restrict entry. A new entrant can only succeed against four entrenched competitors by being very innovative.

Limiting the eligibility of any potential applicants

“The Department’s competition principle restricts incumbents from holding certain licences if:

- (i) that company possesses market power in the supply of one or more telecommunications services in a region covered by the licence to be auctioned;
- (ii) a new entrant is likely to use the licence to provide services in competition with that company’s existing services; and
- (iii) the anti-competitive effects of that company’s acquisition of a licence are not outweighed by the potential economies of scope arising from the integration of the spectrum in question into that company’s existing network”.

I submit that application of the competition principle logically leads to restricting incumbents from holding licences in the current proceeding:

- (i) The four incumbents together possess market power in the supply of cellular/PCS services in every region by virtue of their established market positions, facilities and resources, including large amounts of PCS-type spectrum.
- (ii) Any new entrant will necessarily provide services in competition with the incumbents’ existing and new services
- (iii) The anti-competitive effects of the incumbents’ acquisition of more spectrum are not outweighed by economies of scope.

As a result, I recommend that, in accordance with the Department’s competition principle, eligibility restrictions should apply to the incumbents.

Capital Outlays and Licence Requirements

The Department is concerned about “the large capital outlays...by the existing cellular and PCS service providers ...to meet consumer demand and Departmental licencing requirements.”

It is considerate of the Department to be concerned for the suppliers of cellular/PCS services and their need to outlay capital and meet licencing requirements. However, in a competitive marketplace this should not lead to licencing policies giving undue preference to the incumbents.

All of the licencees are public companies with shareholders, boards of directors and management who are responsible for their profitability and capital expenditures. All four licencees made voluntary submissions in 1995 committing to roll-outs, capital outlays and many other things. Their 1995 commitments were made when it was a reasonable to expect five cellular/PCS licencees. The incumbents have all benefited greatly from five years of only four.

Licence commitments made to Industry Canada were the primary decision criteria for awarding licences in 1995. If any company cannot or chooses not to meet its licencing requirements, it can give back the licences or sell the business. It is not the job of government to attempt to guarantee that the least capable competitor can meet its licence obligations by restricting the amount of competition.

Enhanced Competition: a Worldwide Phenomenon

I strongly support the Department's implementation of "policy measures designed to guarantee the entry of new service providers [to] further enhance the level of competition in the market-place and promote the positive trends for consumers noted".

It is important to understand how other major countries that are Canada's competitors in world markets are implementing similar policy objectives in the licencing of PCS-type spectrum. I have found that, almost without exception, they are increasing the number of licencees in cellular/PCS services.

Indicative of the support for increased competitive is the position of the Minister of Trade and Industry for the United Kingdom. She said that "the prospect of one or more new mobile operators [versus four now] and the increased competition this will bring is good news both for U.K. consumers and the economy. Greater competition will spur the faster rollout of more innovative services, fresh approaches and cheaper prices."¹

Even though they already have higher penetration than Canada, Western European countries are moving speedily to licence 3G with increased competition:

- 12 of 15 will countries in Western Europe will have 3G licences decided by yearend 2000, while Canada is still issuing 2G licences.
- 11 of these countries are issuing more new licences than there are incumbents, thereby ensuring that there will one or more new entrants and increased competition.
- In the five largest countries (France, Germany, Italy, Spain, United Kingdom), all five allow new bidders
- A total of from five to 13 bidders are registered in each of the five countries
- Only Spain among the five has reserved licences for incumbents
- Four of the five provide for open competition between incumbents and new applicants.

¹ Patricia Hewitt, UK minister for trade and industry, Wireless Week, January 21, 2000

3G Licencing in Major Western European Countries

COUNTRY	Incumbents	New Licences	Auction	Bidders
FRANCE	3	4	No	8
GERMANY	4	5	Yes	8
ITALY	4	5	No	10
SPAIN	3	4	No	6
UNITED KINGDOM	4	5	Yes	13

Table 3.2b

I strongly support that increasing the number of Canadian cellular/PCS operators will bring the same benefits to Canada

Splintering and Weakening vs. Growth and Strengthening

The Department is concerned that “splintering of the mobile wireless telecommunications market among a greater number of players could weaken the position of some players in the short term and lead to potentially anti-competitive market consolidation in the longer term”.

I am concerned that not ensuring new Canadian cellular/PCS entrants will perpetuate Canada’s position as a laggard in cellular/PCS penetration compared with other major countries.

The average G-7 country is projecting 56% penetration in 2004 with five or more competitors. This is an average of 11% penetration per carrier. Canada now has about 22% penetration shared among four competitors, an average of 5.5% each. If we can succeed in increasing growth through increased competition there is market opportunity that is twice as big as today for each of five Canadian competitors. That should be enough. The challenge is not how to prevent splintering the market but rather how to grow it. I believe that more competitors will create the bigger market. A win/win for all.

“Weakening the position of some players in the short term” may or may not occur with or without increased competition. That is the reality of a competitive marketplace. However, it does not appear that is likely soon given that “Microcell Telecommunications says it added more than 413,000 new subscribers in 1999...more than double the number of subscribers at the end of 1998 [and] Clearnet signed up over 250,000 new subscribers.”¹ They are going strong.

¹ Microcell, Clearnet Subscribers Rocket, The Gazette< Montréal, January 15, 2000

However, should there be any weak players now or later, they should fix their weaknesses or leave the business by merger or otherwise. Increased competition will only encourage them to do so, to the benefit of Canadians and perhaps themselves.

“Anti-competitive market consolidation” is an unlikely outcome of increased competition. Consolidation may occur due to increased competition or it may occur in any case (note that the new spectrum cap is now big enough to allow it). Even if there were two consolidations following the addition of two new licencees, Canada would still have four licencees (as we do now) and they may well be stronger companies. Let the market and the companies decide.

Categories of Applicant

I agree with the Department’s proposed categories of potential applicants for new PCS spectrum as:

1. National Incumbents: Rogers AT&T Wireless, Clearnet, Microcell
2. Regional Incumbents: Bell, Telus and other ex-Mobility licencees
3. New entrants: none of the above.

Spectrum for new entrants

Should any or all of the incumbents be deemed eligible to bid in the auction, they should not be allowed to buy all of the available spectrum. I consider this to be a highly likely event given the current situation with five major incumbents and only 40 MHz to auction.

I recommend that the benefits of increased competition will only come if at least one block of 10 MHz is reserved for a new entrant in each service area, i.e. not an existing national or regional incumbent.

As to why this is in the public interest, I paraphrase the UK Minister: "**one or more new mobile operators** [versus four now] and the increased competition this will bring is good news both for [Canadian] consumers and the economy. Greater competition will spur the **faster rollout of more innovative services, fresh approaches and cheaper prices**¹." Note that these fresh approaches are not going to come from extending regional incumbents into new regions. We are talking new entrants.

Fortunately for the regulators in the UK and most Western European countries do not face the difficult decisions facing Industry Canada. They are issuing more new licences than there are incumbents. This guarantees at least one new entrant and the resultant benefits of increased competition.

¹ ibid

Canada is in the opposite position with five major incumbents since the break up of Mobility Canada. If block 'C' is subdivided into three sub-blocks of 10 MHz then Canada has four blocks per service area. If 'C' is not divided then there are only two blocks. Whichever way (hopefully not the latter) these blocks can not be spread among five incumbents, let alone leave room for a new entrant.

“Jean Monty chief executive of BCE, said [that BCE will] supplement Bell’s existing capital expenditure program [by \$1.5 billion]. That money will be earmarked for a new wireless network in Alberta and British Columbia...”¹ Telus will likely want to do the same in the East. These two alone clearly have the financial resources to buy all the newly available PCS spectrum in Canada if they want. They appear to want.

The benefits of increased cellular/PCS competition in the public interest should not be lost in a grudge match between Bell and Telus, where PCS licences may well become more of a way to keep score between the giants than a sound business investment.

The Department can ensure increased competition and innovation in Canada by reserving for new entrants one or more 10 MHz blocks out of the 40 MHz withheld from them in 1995.

Compliance with Existing PCS Licence Conditions

The incumbent PCS licencees committed voluntary and in writing to comply with various licence conditions as an essential part of the 1995 PCS licencing process. As a losing applicant in that process, I would consider it unjust if a winning applicant were allowed to retain its licence when it did not comply with those obligations in all material ways. Given that the licence submissions and the annual compliance reports are confidential, only Industry Canada knows if such a situation exists. If it does I recommend that the Department proceed to revoke such licence(s).

With respect to eligibility for the proposed PCS auction, a PCS licensee (and affiliates) who is not compliant with its licence obligations should be ineligible to bid on or acquire additional licences. Non-compliance with previous licence obligations should not be rewarded with the opportunity to add new licences.

¹ Financial Post, February 26, 2000

4. DEFINITION OF LICENCES

4.1 SPECTRUM LICENCES

I agree with the Department's proposal that the elements laid out in the *Framework for Spectrum Auctions in Canada* document be generally adopted for this licencing process.

4.2 SPECTRUM STRUCTURE

The current PCS spectrum structure has been the basis for licencing PCS systems in Canada, the United States and other countries in the Americas. Among the reasons for adopting the structure in 1995 were:

- Harmonizing with the U.S. block plan to facilitate roaming and cross-border sharing.
- Avoiding technological problems that could affect the availability and cost of equipment if a different block plan were used.

Maintaining the current symmetrical paired block structure with subdivision of the 'C' block into 5+5 MHz channels continues to meet these objectives.

(i) Minimum Block Size

I support retaining the current minimum block size of 5+5 MHz that occurs in the 'E' block. This block size is compatible with all of the 2G, 2.5G and 3G technologies. The different channel bandwidths of the three 2G access technologies (1.25 MHz for CDMA, 200 kHz for GSM and 30 kHz for TDMA) all fit reasonably efficiently into a 5+5 MHz paired block structure. I have been assured by major manufacturers that 5+5 MHz is also well suited to implementation of 2.5 and 3G technologies.

(ii) Sub-Block Structure

I recommend a sub-block structure of four 5+5 MHz blocks, i.e. subdivide the C/C' block equally into C1/C1', C2/C2', C3/C3' plus the current E/E' block.

This would create four paired blocks of equal size and capability. Bidders could choose among them based on contiguity if relevant. Major bidders could buy multiple blocks as appropriate. Blocks could be traded, transferred or sold as appropriate. Four blocks gives the highest likelihood of meeting the Department's "desire to see greater competition and advanced services in all regions of Canada" should a different bidder (hopefully including one or more new entrants) win each of the four blocks in a service area.

(iii) Roaming and Cross-Border Sharing

I propose that the policy of requiring incumbent cellular operators to provide new PCS entrants access to analog cellular resale and roaming should be extended to apply to all incumbent cellular/PCS operators and their digital cellular and PCS services.

In my opinion, no new entrant is likely to win more than a single 10 MHz block per area in the auction. To succeed the new entrant would need to concentrate on the provision of new innovative services. This is fully consistent with the Department's "desire to see... advanced services." However to serve Canadians well and to attract customers, the new entrant would also need to provide the full portfolio of existing cellular and PCS services. 10 MHz would not be enough capacity to do both. Digital cellular/PCS resale and roaming would allow the new entrant to focus on innovative new service while providing customers with a full portfolio of services. As now, the incumbents would be fairly compensated for use of their networks. However, if this were not a condition licence, one or more of the incumbents could well deny resale and roaming to the new entrant(s) for the sole purpose of reducing its viability.

Technology compatibility is not an issue. There was no requirement that the regional operators implement the same digital cellular/PCS technology on the same frequencies across Canada (although they did) or across the United States (where they didn't). The US situation has created a large market for multi-band, multi-mode devices that search for different protocols within the same area or the same protocol in other territories. Manufacturers are likely to continue to produce new multi-band multi-mode devices for 2.5 and 3G markets.

(iv) Technical Challenges

I support paired, symmetrical frequency blocks. Paired, symmetrical blocks are standard throughout the world and provide full flexibility for both FDD and TDD systems serving both symmetrical and asymmetrical traffic.

Need for Contiguous Spectrum

Any operator would prefer to have continuous spectrum blocks. In the current auction, should it be eligible, Cantel would be in the best position to benefit from this given that its F/F' block is adjacent to both the C/C' and E/E' blocks. Clearnet would also be in a good position since the E/E' is also adjacent to its B/B' block. However the other two incumbents do not have the opportunity to add adjacent spectrum. Since new entrants don't have any spectrum, contiguous spectrum is just a dream.

That all said, the auction readily takes care of differing views on the value of a particular block of spectrum. Any bidder can bid more for a block that it considers to be more valuable. Wispra certainly did so in the 24/38 GHz auction. Combining this with the likelihood of transferability of spectrum (see below) means that most if not all bidders can get contiguous spectrum if they are willing to pay for it. Nothing need be done here.

▪ Transferability for Contiguous Spectrum

Industry Canada approved the transferability and divisibility of spectrum in the 24/38 GHz auction and has proposed the same for this one. I agree.

- **Structure for Asymmetrical Traffic**

I recommend staying with the world standard symmetrical block structure. Asymmetrical data transmission does not need asymmetrical spectrum blocks.

All PCS channels in the United States and elsewhere are symmetrical. Even if there were a Canadian need, it has been shown with CT2+ and other situations that manufacturers will not develop special equipment for the small Canadian market.

Asymmetrical data flow has been the experience with residential Internet access where downloads greatly exceed upward queries and email. Asymmetrical data flow may well become a traffic characteristic for PCS-type services in future due to wireless Internet and wireless data communications.

More likely than asymmetrical blocks to meet this need is the development of asymmetrical data rate systems operating on standard symmetrical spectrum blocks. The market for this is worldwide. This arrangement is already being designed into broadband wireless systems operating above 20 GHz (for the same reasons) where high data rate (16 QAM or 64 QAM) modulation is used on the high power down link from the base station and lower data rate (4QAM or QPSK) on the low power uplink from the end user. This works well with high power base stations and low power end user devices.

- **Special Provisions for Time Division Duplexing (TDD)**

The current paired symmetrical blocks should also work fine with TDD. TDD involves alternately sending and receiving within the same frequency block (often called ping-pong) thereby allowing for both symmetrical and asymmetrical traffic. It has generally been less preferred where symmetrical blocks are available due to the inefficiency associated with the turnaround time between transmit and receive. Should TDD technology that operates on the PCS frequencies become available, there is nothing to prevent their use on paired 5+5 MHz blocks. Some manufacturers are developing TDD systems to operate on paired and unpaired blocks above 20 GHz.

4.3 GEOGRAPHY

4.3.1 NATIONAL VERSUS REGIONAL LICENCING

Cellular now covers over 93% of the population and the Department has not imposed additional obligations to increase coverage beyond the original roll-out commitments of 1983. I commend the Department for its 1998 policy (RP-019) allowing new cellular licencees to serve under-served and unserved areas.

Although the PCS operators have now extended their PCS coverage to all regions of Canada, it is not clear whether they are all fully compliant with the conditions of licence imposed in 1995. Specifically Condition 1.0 addressing full national coverage:

"In order to realize the Government's objective of full coverage, you must implement your system substantially in accordance with the full five year plan contained in your detailed submissions to the Department notwithstanding any stated conditions therein. In addition, you and any entities with which you have submitted an application for 2 GHz PCS, must offer a reasonable level of service in all regions of Canada within two years of the date of this authorization."

If they have not fulfilled the coverage commitment (or other major commitments), I recommend that Industry Canada proceed to revoking the licences of any non-compliant PCS licencees and not allow participation in the auction.

I also recommend that the policy RP-019 now applicable to cellular be extended to PCS at the end of the first five year licence term so that Canadians may benefit from PCS from new providers in under-served and unserved areas of Canada.

4.3.2 GEOGRAPHIC DIMENSION OF LICENCES FOR SPECTRUM IN BLOCKS 'C' AND 'E'

Tier 2 Service Areas

I support the proposed Tier 2 service areas as the appropriate choice for the PCS spectrum auction. The Tier 3 areas are too small for mobile services. Cell planning and roaming between contiguous areas, unless held the same licencee, would be prohibitively complex. Furthermore, as experienced with the 24/38 GHz auctions, this may lead to some or perhaps many of the smaller service areas not being bid on.

The Tier 1 national licences are too big to meet the needs or financial capabilities of many prospective bidders. This would adversely affect the availability on new and innovative services to Canadian. Regional or small players would be less able to participate and win if licences were nationwide. It could also distort the auction process should regional licencees, if they were eligible to bid, feel the need to buy unneeded nationwide spectrum in order obtain licences outside their current regions.

The Tier 2 service areas are just right. They provide large enough areas for planned deployment and produce less roaming issues. Regional incumbents can bid appropriately and smaller players have a better chance to participate.

National Coverage Obligation for Regional Incumbents

If regional incumbents were eligible to bid to expand their serving areas, their coverage obligations should be the same as any other bidder as defined in the conditions of licence (section 6). In practice, a national coverage obligation may not be enforceable if a regional incumbent does not buy spectrum in all other service areas.

All Region Coverage Obligation for New Entrants, Given Identified Spectrum

In the 24/38 GHz auction, licence obligations included a reasonable amount of deployment in each service area within three years. The Department has not proposed similar conditions of licence in section 6. That's ok. Should build-out obligations apply to new entrants given identified spectrum, they should not be greater than those applying to regional incumbents.

All Region Coverage Obligation for New Entrants, Given No Identified Spectrum

If one or more new entrants were successful in the auction with no identified spectrum, it would be a miracle. No build-out requirements should apply.

4.4 DISPLACEMENT OF MICROWAVE INCUMBENTS

I support the Department's proposal that:

- As of January 1, 2001, all fixed frequency assignments subject to displacement will be afforded a minimum of a two-year notification period.
- 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.
- Starting on January 1, 2002, the Department may establish geographic areas and serve notification that all fixed frequency assignments in these areas must cease operation within one year.

In 1994 Industry Canada placed a moratorium on the licencing of new fixed microwave systems in the PCS band and in 1995 the band was designated for PCS. Any remaining fixed microwave operators in the band have already had a long time to move. The proposed policy is generous.

4.5 LICENCE TENURE

I agree with the Department's proposal "that licences have a ten-year term and a high expectation of renewal at the end of the term".

This is the same as the 24/38 GHz auction. It provides licencees with reasonable assurance that their investment in licences and infrastructure will become a viable ongoing business. It is also fair compared with the incumbent cellular/PCS licences having a five year term, no upfront licence payments and a high likelihood of renewal.

4.6 TRANSFERABILITY AND DIVISIBILITY

I agree with the Department's proposal that "auctioned licences will be transferable and divisible (i.e., transferable in part in the spectral and/or bandwidth dimensions) subject to the [identified] conditions and guidelines": Again this is the same as the 24/38 GHz auction rules.

I support the different treatment between auctioned spectrum and spectrum obtained in previous proceeding whereby the transfer of an existing radio licence to another party continues to be subject to a full review of the application by the Department and the approval of the Minister.

I also support favourable treatment of requests for any post-auction spectrum transfers needed to rationalize the holdings of all PCS licencees.

5. TECHNICAL CONSIDERATIONS

I support the Department's proposal to be technology neutral and to apply the defined minimal technical requirements to usage of blocks 'C' and 'E'. This is consistent with both the 24/38 GHz auction and previous PCS licencing.

6. CONDITIONS OF LICENCE

I agree with all of the conditions of licence as proposed.

7. LICENCING PROCESS AND AUCTION DESIGN

I agree with the licencing process and auction design as proposed using the same process and rules as the 24/38 GHz auction. The first auction operated smoothly and efficiently (congratulations to Industry Canada). "If it ain't broke don't fix it" and it isn't broken. Some tinkering to avoid undue lengthening of the auction by one or a few parties would likely speed the ending of the auction. However, if it were not done it would not materially affect the outcome or the overall process of the auction.

8. FINANCIAL ASPECTS

Although I find the pre-auction deposits and opening bid amounts of \$1 per population per 10 MHz to be amazingly high, I accept the financial aspects of the auction as proposed.