



SIGNAL STRENGTH: Setting the Stage for Canada's Wireless Industry in the Next Decade



Ian Munro

November 2010

Atlantic Institute for Market Studies

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Atlantic Institute for Market Studies
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EXECUTIVE SUMMARY

Since their inception in 1985, wireless telephony services have become commonplace and widely available across Canada. Wireless revenues now exceed both traditional local telephone and long distance revenues and wireless services are a key productivity driver for Canadian businesses.

On March 31, 2011, a number of wireless licences will expire. In a 2009 consultation paper, Industry Canada proposed to renew these licences, although with some modifications to the licence terms, conditions, and fees.

This paper makes the argument that these licences should be renewed, and their terms and conditions should be amended to make the licences resemble property rights to the extent possible.

Licences that were originally assigned by auction should not be subject to renewal fees, while licences assigned through non-auction processes should continue to be subject to fees, but no radical changes to fee levels should be enacted. While Industry Canada may be well-intentioned in wishing to set renewal fees based on estimated market value, the inherent methodological difficulties of the exercise throw its reliability into question.

To avoid causing undue uncertainty to wireless operators in the future, and to avoid placing itself between the proverbial rock and hard place, the auction framework should be amended so that all licences offered in future auctions have strong property right characteristics and are clearly not subject to undefined future renewal fees.

However, the ability of Industry Canada to implement some of these recommendations is constrained by the realities of the legal basis for spectrum management laid out in the *Radiocommunication Act*. In order to fully realize the benefits described in this paper, institutional and statutory change will be required.

Author's Note – November 23, 2010

Just as this paper was being finalized for publication, Industry Minister Tony Clement gave a speech to the International Institute of Communications Canada conference on November 22, 2010, in which he touched on several of the issues raised in this paper.

The Minister announced that cellular and PCS licence fees have been frozen “for the moment”, that a review of Industry Canada’s policy on tower sharing and roaming will be launched, and that the length of licences for mobile broadband spectrum will be extended to 20 years for all future auctions and upcoming licence renewals.

This paper argues against any radical change to current cellular and PCS licence fees, so the announcement of a freeze is prima facie good news. However, the Minister has not stated whether the current “moment” extends to next week, next month, next year, ... or next Minister. As such, this particular freeze provides particularly cold comfort.

With regard to tower sharing and roaming, the current policy is rather dirigiste for a marketplace that is competitive and for a government that has espoused reliance on the marketplace rather than regulation for the communications sector. While the policy ostensibly helps new entrants as they build their own networks to compete with established incumbents, it can have the unintended consequence of diminishing newcomers' incentives to invest in the development of their own infrastructure. A review of the policy is warranted.

A 20-year licence term is preferable to a 10-year one, but still falls short of this paper's recommendation to move licences to an essentially perpetual term.

INTRODUCTION

Since its beginnings in the mid 1980s, the Canadian wireless phone industry has grown from serving a small number of (mainly) business users in the country's major centres to a mass consumer market covering almost all of the country's populated geography. According to the Canadian Wireless Telecommunications Association (CWTA), more than 99 percent of Canadians now have wireless coverage, there were 23.4 million subscribers (almost 70 percent of the population, or, put another the way, equal to the entire population of Atlantic Canada, Quebec, and Ontario put together) in Canada as of June 2010, and wireless revenues in 2009 totalled almost \$17 billion (roughly one percent of Canada's Gross Domestic Product).¹

The companies who provide our wireless services – such as Aliant, Bell Mobility, MTS Allstream, Rogers, SaskTel and TELUS – all require licences from Industry Canada (“the Department”) to utilize the necessary radio spectrum. On March 31, 2011, many of these licences will expire. In a March 2009 consultation paper, Industry Canada proposed to renew these licences, although with some modifications to the terms and conditions of these licences as well as to the licence fees that the licensees pay for their spectrum.

This paper will examine the issues at play in the decision to renew these licences, including the relevant terms, conditions, and fees. More specifically:

- Section 1 reviews the history of the Canadian wireless phone industry;
- Section 2 contains an overview of the sector's role in the economy;
- Section 3 summarizes the Industry Canada consultation process to date;
- Section 4 analyses the issues at hand; and,
- Section 5 provides conclusions and recommendations.

I am indebted to two anonymous reviewers for their very insightful comments on an earlier draft, particularly with regard to the legal framework in which Industry Canada and its Minister operate. All errors and omissions, of course, remain my own.

¹ <http://www.cwta.ca/CWTASite/english/index.html>

1. A BRIEF HISTORY OF CANADA'S WIRELESS INDUSTRY

Commercial wireless phone service began in Canada in 1985. Three years earlier in 1982, the Canadian Department of Communications announced that 20 MHz of spectrum for cellular phone services had been set aside for the local telephone companies and that applications would now be accepted for another operator to acquire a second 20 MHz licence. Cantel (now Rogers Wireless) was announced as the winner of the second licence in 1983. In 1989 all cellular licensees received an additional 5 MHz of spectrum, bringing the total to 25 MHz.

A second generation of wireless telephone service called PCS (personal communications services) was launched in 1995. In this comparative review licensing process (sometimes referred to informally as the “beauty contest” approach), the incumbents (Rogers and the wireless arms of the local telephone companies) were each granted a 10 MHz licence and two newcomers, Clearnet and Microcell, received 30 MHz licences. Another 40 MHz of spectrum that could have been assigned was held in reserve. (In response to this decision, Telezone, one of the unsuccessful applicants, launched a multimillion dollar lawsuit against the federal government. This case remains before the courts today.)

In 1998 the longstanding cooperation among Canada's incumbent telephone companies broke apart, as did the umbrella group for their wireless operations, Mobility Canada. The phone companies for British Columbia (BCTel), Alberta (AGT), and parts of eastern Quebec (Quebec Telephone) merged into TELUS. The wireless arms of Bell Canada (covering most of Quebec and Ontario), NewTel (Newfoundland), MT&T (Nova Scotia), Island Tel (PEI), NB Tel (New Brunswick), MTS (Manitoba) and Sasktel (Saskatchewan) remained affiliated in the Bell Wireless Alliance. (A number of smaller municipal phone companies such as Thunder Bay Tel also remained in the Bell Wireless Alliance.)

TELUS acquired Clearnet, and its 30 MHz of national spectrum, in 2000. In order to comply with a cap on spectrum holdings that was in effect at the time, TELUS was required to return some frequencies in parts of Alberta, British Columbia, and Quebec to Industry Canada.

Industry Canada held its first auction of mobile wireless spectrum in 2001,² with the 40 MHz held over from the 1995 PCS licensing process and the spectrum returned to Industry Canada by TELUS in 2000 up for bidding. Aside from a small number of licences won by a newcomer called W2N, all the licences available in the auction were won by incumbents. W2N's licences later were sold on the secondary market to incumbents.

The incumbent phone companies in the four Atlantic provinces merged into Aliant in 2002 and in 2006 Aliant's operations were merged into Bell Canada, with Bell Mobility taking over all wireless operations.

The last major industry consolidation saw Rogers acquire Microcell in 2004. Bell Canada and MTS ended their alliance in 2004 as well.

In early 2008 the wireless market was essentially a three-way affair: Bell, Rogers, and TELUS covered Atlantic Canada, Quebec, Ontario, Alberta and British Columbia; MTS, Rogers, and TELUS competed in Manitoba; and SaskTel, Rogers, and TELUS were in Saskatchewan. In May of that year Industry Canada's auction of AWS (Advanced Wireless Services) spectrum opened, providing a new opportunity for incumbents to increase their spectrum holdings. As well, 40 MHz of spectrum was set aside for new entrants only, thereby guaranteeing the introduction of new competitors to the marketplace. Bell, MTS, Rogers, SaskTel, and TELUS all did win substantial amounts of AWS spectrum. Cable companies Eastlink, Vidéotron, and Shaw also won significant numbers of licences, chiefly, but not exclusively, in their cable franchise areas (Atlantic Canada, Quebec, and western Canada, respectively). Other newcomers winning large amounts of spectrum included Globalive, DAVE, and Public Mobile.

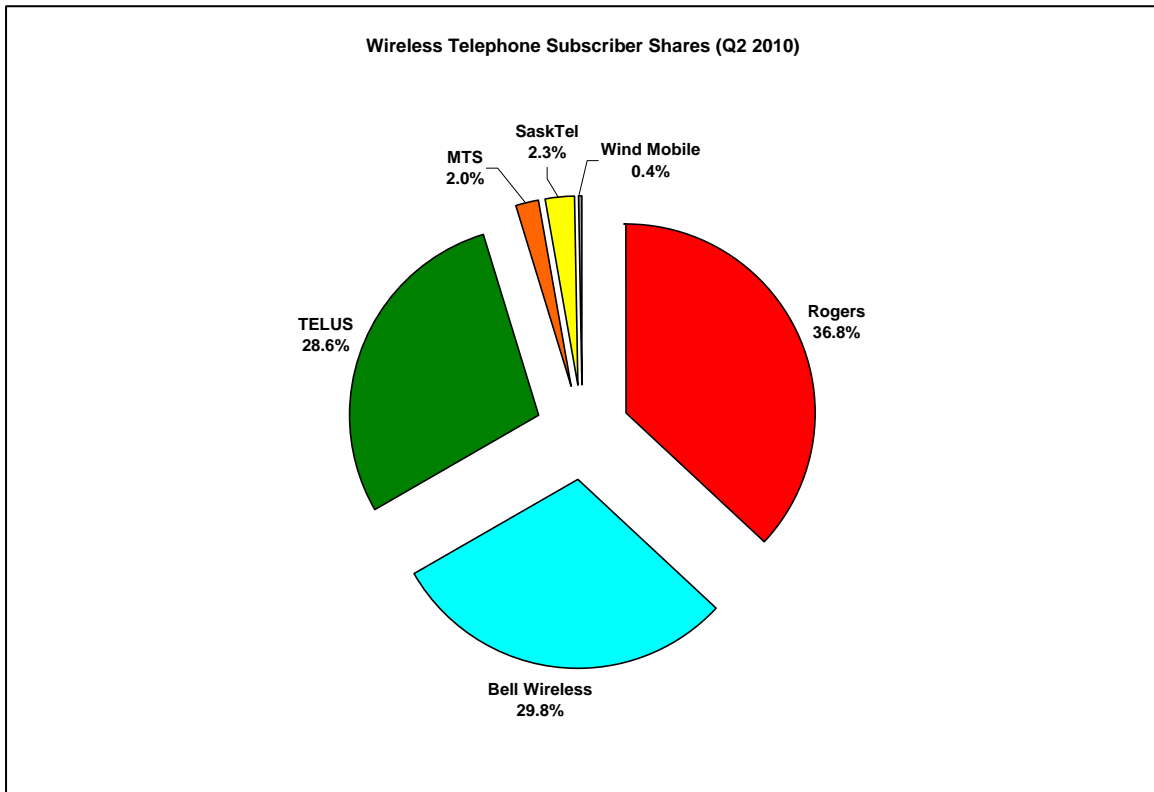
In addition to these spectrum licensees, a number of resellers and MVNOs (mobile virtual network operators) offer services, including Primus and President's Choice Mobile. Bell, Rogers, and TELUS also have subsidiary and discount brands (Solo and Virgin for Bell, Chatr and Fido for Rogers, Koodo and Mike for TELUS) in addition to their own name brands.

Industry Canada is expected to put more spectrum for wireless telephone services on the market within the next few years, but no policy or timeline details are available yet.

² Industry Canada's first spectrum auction, held in 1999, was for fixed service licences, i.e., bidders bid for the rights to frequencies that could be used to transmit signals to and from antennas fixed to rooftops, for example.

Figure 1 below illustrates the providers' subscriber shares as of the second quarter of 2010. Table 1 summarizes key highlights in the wireless industry since the early 1980s.

Figure 1



Source: Canadian Wireless Telecommunications Association:

http://www.cwta.ca/CWTASite/english/facts_figures_downloads/SubscribersStats_en_2010_Q2.pdf.

Table 1

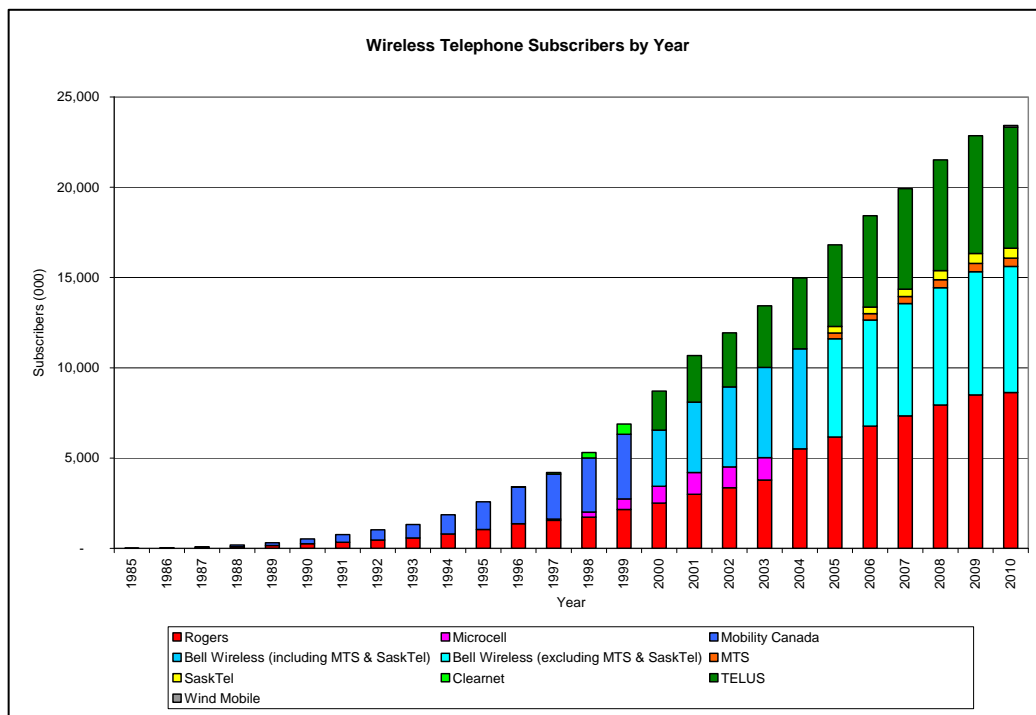
Key Events in the History of the Canadian Cellular Phone Industry	
1982	The federal Department of Communications announces that one 20 MHz block of spectrum for cellular phone services has been set aside for the local telephone companies and that a comparative review process (“beauty contest”) is now open for the second 20 MHz block of spectrum.
1983	The Department announces that Cantel (now Rogers Wireless) has won the second block.
1985	Cellular phone service commences in Canada.
1989	The incumbent cellular licensees are granted an additional 5 MHz of spectrum, bringing the total to 25 MHz each.
1993	The Department of Communications is disbanded and spectrum management responsibilities are moved to the newly formed Industry Canada.
1994	In <i>Telecom Decision CRTC 94-15</i> the Canadian Radio-television and Telecommunications Commission (CRTC) determines that it has the authority to regulate the cellular phone rates charged to consumers, but also concludes that it is appropriate to forebear from exercising this authority, given the state of competition in the marketplace.
1995	Industry Canada awards second generation cellular licences known as “personal communications services” (PCS) via a comparative review process (“beauty contest”). Newcomers Clearnet and Microcell each receive a 30 MHz licence and the cellular incumbents – Rogers and the members of Mobility Canada (i.e., the wireless affiliates of the local telephone companies) – each receive a 10 MHz licence. Another 40 MHz of PCS spectrum is held in reserve.
1998	The local telephone companies in Alberta (AGT), in British Columbia (BC TEL), and in certain areas of Quebec (Quebec Telephone) merge to form TELUS. TELUS leaves the Mobility Canada alliance; the remaining members are reconstituted as the Bell Wireless Alliance.
2000	TELUS acquires Clearnet.
2001	The remaining 40 MHz of PCS spectrum is assigned via an auction. Almost all of the licences up for bidding are won by cellular/PCS incumbents.
2002	The local telephone companies in Atlantic Canada (NewTel, MT&T, Island Tel and NB Tel) consolidate as Aliant.
2004	Rogers acquires Microcell. MTS and Bell Canada end their alliance.
2006	Aliant’s operations are merged into Bell Canada. Bell Mobility takes over all wireless operations.
2008	Industry Canada’s auction of Advanced Wireless Services (AWS) frequencies makes another 105 MHz of spectrum available for cellular services. Both incumbents and a number of newcomers win licences across the country.
2009	Industry Canada issues <i>Consultation on the Renewal of Cellular and Personal Communications Services (PCS) Spectrum Licences</i> . Wind Mobile, a winner of spectrum in the 2008 AWS auction, launches service and becomes the first new entrant to the wireless telephone industry in over a decade.
2010	More new entrants who won spectrum in the 2008 AWS auction – such as Mobilicity, Public Mobile, and Vidéotron – begin to roll out services.

2. OVERVIEW OF THE WIRELESS TELEPHONE SECTOR

The Canadian wireless telephone industry has amassed an impressive growth record over its 25-year history.

The CRTC reports that in 2009 there were 23.8 million subscribers who generated \$16.8 billion in revenue.³ Figures 1 and 2 display the growth in subscribers and revenues, respectively, since the mid 1980s. Since 1985, the number of subscribers has grown at a compound annual growth rate (CAGR) of over 39 percent, while revenues have grown, in constant dollar terms, at a CAGR of over 22 percent since 1987 (as compared to a CAGR for real gross domestic product of slightly over 2 percent over the same period). Annual wireless revenues now exceed traditional local telephone and long distance revenues.

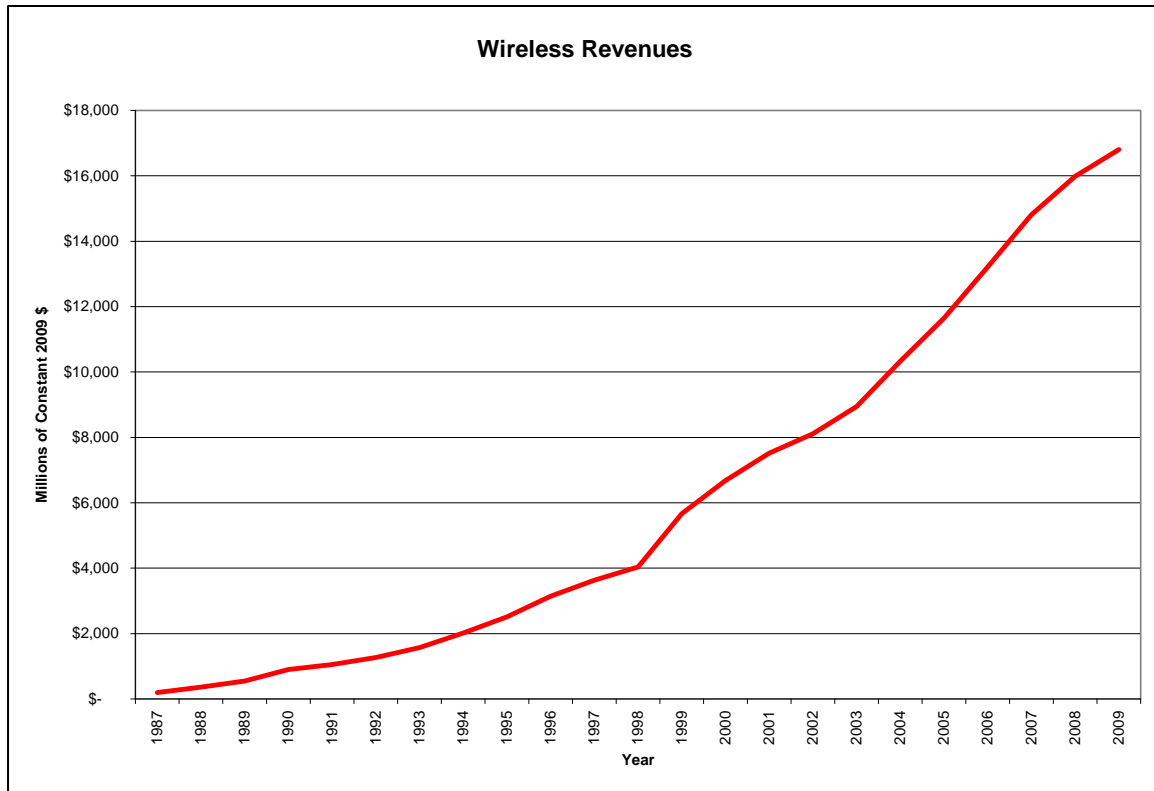
Figure 2



Sources: CRTC (<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>), CWTA (<http://www.cwta.ca/CWTASite/english/industryfacts.html>).

³ CRTC *Communications Monitoring Report, 2010*, pp. 153-163, <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>.

Figure 3



Sources: CRTC (<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>), CWTA (<http://www.cwta.ca/CWTASite/english/industryfacts.html>).

In terms of coverage, the CRTC reports that approximately 20 percent of Canada's geography and 99 percent of Canada's population now have wireless coverage, including more than 90 percent in each province. Advanced networks (e.g., ones that support smart phones such as Blackberries and iPhones) now are available to roughly 96 percent of the Canadian population.

According to the Canadian Wireless Telecommunications Association (CWTA), the wireless sector generates \$39 billion in annual economic activity, invests more than \$1 billion annually in infrastructure, and is responsible for the employment of almost 300,000 Canadians.⁴

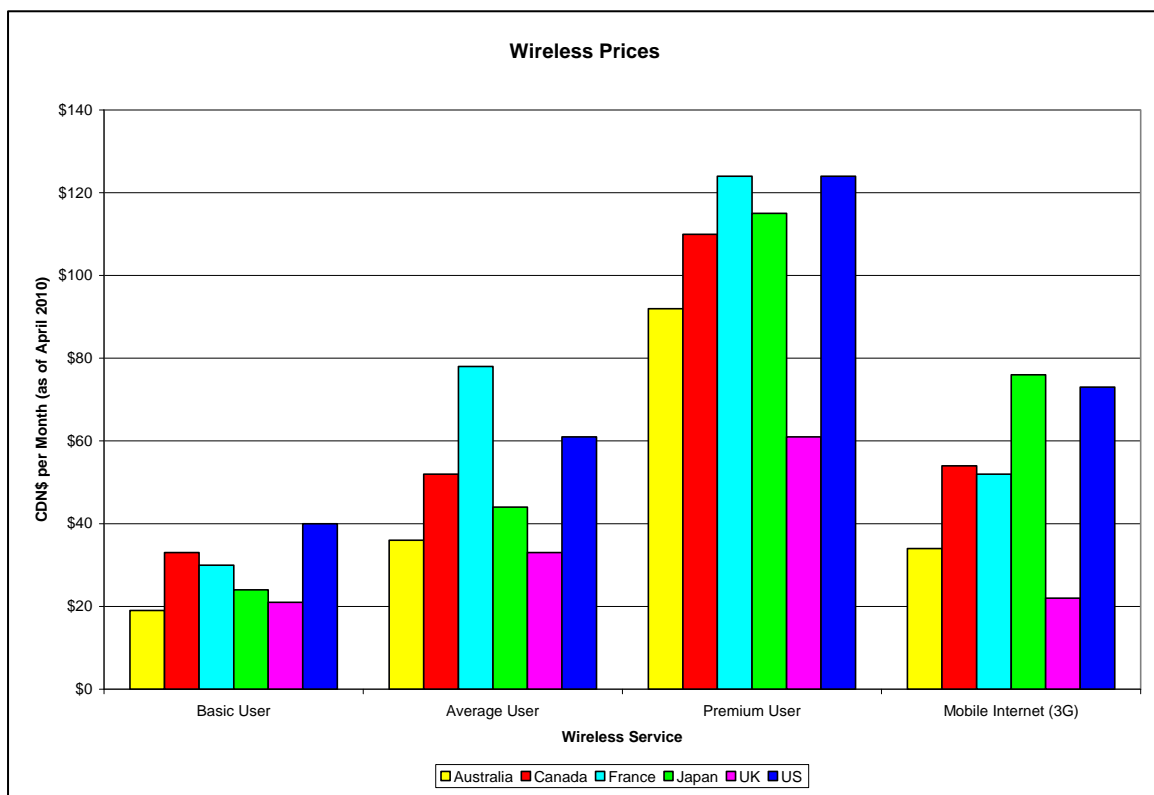
Cellular and PCS licensees pay approximately \$150 million in annual fees for the licences that were awarded in non-auction processes (i.e., the initial cellular licences and the first round of PCS

⁴ <http://www.cwta.ca/CWTASite/english/industryfacts.html>

licences in 1995). These fees are in addition to the \$1.5 billion that was raised in the 2001 PCS auction and the \$4.3 billion generated in the 2008 auction of AWS spectrum.

While it is common to hear that “Canadians pay much more for wireless services than do people elsewhere in the world,”⁵ the data do not necessarily back this claim. According to a 2010 survey reported by the CRTC, for average and premium users of wireless services, and for mobile Internet services, Canadian prices are very close (within 5 percent) to the average calculated over Australia, Canada, France, Japan, the UK, and the US. For basic service, Canada does have the second-highest price among these six countries, almost 20 percent above the average. However, the absolute difference between the Canadian rate and the average rate for basic service is roughly equivalent to the price of one small Tim Horton’s coffee per week. Figure 4 displays the price data graphically.

Figure 4

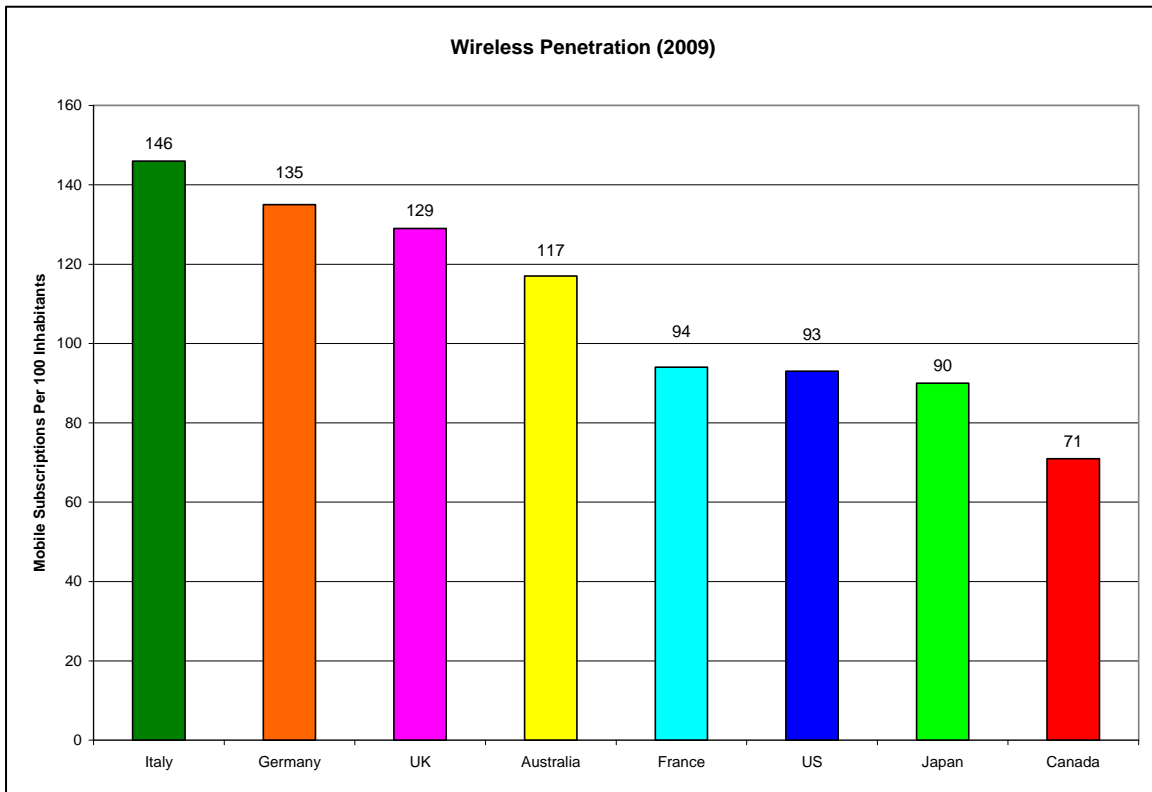


Source: CRTC (<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>).

⁵ CRTC *Communications Monitoring Report, 2010*, p. 164,
<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>.

Another common criticism that is better supported by the facts is that Canada has a relatively low penetration rate. In a 2009 survey of eight countries, Canada does indeed have the lowest rate of mobile subscriptions per 100 inhabitants – see Figure 5.

Figure 5



Source: CRTC (<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>).

Table 2 provides comparative international statistics on market structure. Note that the market concentration statistics do not necessarily correlate with price levels. For example, the United States has the largest number of major providers and one of the lower values for combined market share of the top two providers, yet is at the higher end in all categories of the pricing survey depicted in Figure 4. Conversely, Australia has only three major providers and a relatively high 74 percent market share for its top two providers, yet boasts low prices compared to the other countries in the pricing survey.

Table 2

Market Structure Statistics		
Country	Number of Major Providers	Market Share (Subscribers) of Top Two Providers
Australia	3	74%
Canada	3	67%
France	3	77%
Germany	4	68%
Italy	4	70%
Japan	4	77%
UK	5	51%
US	6	61%

Source: CRTC (<http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2010/cmr.htm>)

3. INDUSTRY CANADA'S CONSULTATION PROCESS

In March 2009 Industry Canada issued the document *Consultation on the Renewal of Cellular and Personal Communications Services (PCS) Licences*⁶ (“the consultation paper”). In that document Industry Canada proposed to renew a number of licences upon their expiry in March 2011, although with some modifications to terms, conditions, and licence fees.

Before turning to the details of the issues raised in that document, it is useful to briefly review the evolution of cellular and PCS licences over the past 25 years.

Section 3.1 – The Evolution of Cellular and PCS Licences

The cellular authorizations awarded in the 1980s and the first PCS authorizations awarded in 1995 featured fixed terms of five and ten years, respectively. There was no explicit assurance of licence renewal at the end of the licence term, but renewal was implicitly understood – it was unlikely, for example, that Rogers Wireless would have been denied the renewal of its cellular licences in the 1990s when it already had made billions of dollars of infrastructure investments and had established a subscriber base of more than one million Canadians.

Under these authorizations, the cellular and PCS operators were required to obtain a licence (known as a “radio licence”) for each cellular antenna that was established. As wireless coverage areas grew, the number of these radio licences rose into the hundreds and thousands. The licence fees paid by the operators were calculated on a per-antenna basis and bore no real connection to the actual value of the authorization. Also, since each new antenna tower would result in higher fees for the licensees, the wireless operators actually faced economic disincentives to expand their coverage areas to more Canadians and/or to make more efficient use of their spectrum by installing more towers within a given geographic area.

In 1996 the *Radiocommunication Act* was amended to give the Minister of Industry the authority to use auctions to assign radio authorizations. As well, a new class of authorization, the “spectrum licence”, was created. In contrast to a radio licence that is specific to a piece of apparatus (e.g., a cellular antenna tower), a spectrum licence is defined in terms of geography (e.g., Canada, the

⁶ [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/dgrb-002-09-eng.pdf/\\$FILE/dgrb-002-09-eng.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/dgrb-002-09-eng.pdf/$FILE/dgrb-002-09-eng.pdf)

province of Alberta, the city of Corner Brook, one or more census areas as defined by Statistics Canada, etc.). The holder of a spectrum licence does not need to acquire a licence for each antenna erected within its spectrum licence area, and the fee for the spectrum licence has no connection to the number of antennas in operation within the area.

The PCS licences awarded by auction in 2001 and the AWS licences auctioned in 2008 are all spectrum licences. These auctioned spectrum licences also have been given more property-like definitions as compared to licences issued in the pre-auction era: they are valid for ten years with an explicitly expressed likelihood of renewal (so long as the licensee complies with its conditions and no fundamental reallocation of spectrum to a new service is required) and they are explicitly transferable and divisible in the secondary market. It must be noted, however, that in practice transfers do require the *approval* of the Minister because, as a matter of administrative law, the Minister's discretion cannot be fettered by policy. Therefore these licences are not as close to property rights as they might seem on a plain reading of the licence terms and conditions.

Recognizing both the discrepancies among different vintages of cellular and PCS authorizations and the counter-productive incentives embedded in the older radio licence-based authorizations, Industry Canada moved all cellular and PCS licences onto a common spectrum licence basis in 2004. All these licences feature ten-year terms, a presumption of renewal at the end of the term, and are transferable and divisible (again, legally tempered by the Minister's unfettered discretion). For those licences not awarded by auction, the fees are fixed based on the bandwidth and population covered by the licence.

A request for proposals (RFP) entitled *Study to determine the value of Cellular and Personal Communications Services (PCS) spectrum in Canada* was issued by Industry Canada in July 2009. The RFP stated that the winning contractor would "be required to complete a study that determines the value of Canada's Cellular and PCS spectrum" and that "Industry Canada will take this value into consideration when it determines an annual fee for the renewal of Cellular and PCS spectrum licences." The consultant's report for this project has been completed and submitted to Industry Canada, but it has not yet been released to the public.

Section 3.2 – The Consultation Proposals

In the consultation paper, Industry Canada proposed that licences be renewed with, among others, the following terms and conditions:

- All licences will have a term of ten years, commencing April 1, 2011. (Industry Canada opened a separate, general discussion on the appropriate length of licence terms in *Consultation on Revisions to the Framework for Spectrum Auctions in Canada*, released in April 2009. Comments and reply comments were received in June and July, respectively, of 2009. Industry Canada has yet to issue any response or final policy document within this auction framework consultation process.)
- In the body of the consultation paper, Industry Canada proposes that at the end of the ten-year term there will be a presumption of renewal so long as no breach of licence condition has occurred. However, in the text of the proposed licence conditions themselves, the language is less definitive: “The process for issuing licences after this term and any issues relating to renewal will be determined by the Minister of Industry following a public consultation.”
- Licences will be transferable and divisible in the secondary market. To effect a transfer the transferor must apply for Departmental approval and the transferee must attest that it meets all eligibility requirements to hold the licence(s) in question.
- No implementation of spectrum usage (“roll out”) requirements will be imposed given the extensive cellular and PCS network coverage that now exists in Canada.
- The requirement for licensees to spend two percent of their revenues on research and development will remain in place, subject to the outcome of a parallel review of this policy under the auspices of the *Consultation on Revisions to the Framework for Spectrum Auctions in Canada* process.
- Subject to certain exemptions, licensees must share antenna towers and sites and must allow customers of other operators to roam on their networks.
- Renewal fees should be set to “earn a fair return for the Canadian public” and “reflect the underlying market value” of the spectrum. As noted previously, Industry Canada has

promised, but not yet launched, a separate consultation process specific to the question of cellular and PCS renewal fees.

Section 3.3 – Consultation Comments

Industry Canada received a total of eleven comments and nine reply comments. The parties who made submissions included major wireless carriers (Bell Mobility, MTS Allstream, Rogers, SaskTel, and TELUS), smaller carriers (First Networks, Lynx Mobility, TBayTel), newcomers to the marketplace (Quebecor – the parent company of Vidéotron), industry umbrella organizations (the CWTA and the Canadian Independent Telephone Company Joint Task Force), and one individual Canadian.

While there was disagreement between the larger players and the smaller players regarding mandatory roaming and tower-sharing and regarding the policies that were appropriate to spur the expansion of wireless networks into northern and remote areas, there was substantial consensus in the comments on several major points:

- Licences should have indefinite terms, or at least terms longer than ten years.
- More certainty should be provided regarding the renewal of licences at the end of their terms.
- The process for transferring licences should be streamlined and should rely on attestations, rather than Departmental review and approval.
- The condition requiring that a percentage of revenues be spent on research and development should be removed.
- There should be no renewal fees for auctioned licences, or at most, these fees should be limited to recovering Industry Canada's relevant spectrum management costs.

The March 31, 2011, expiry date for many licences is now only a few months away. Industry Canada has yet to initiate its promised consultation process on the matter of renewal fees or to announce any policy decisions regarding the other issues that are in play.

4. ANALYZING THE ISSUES

As a practical matter, Industry Canada had no option but to propose renewal for cellular and PCS licences in 2011. The licensees have spent billions of dollars in developing their networks and millions of Canadians rely heavily on the services they provide on a daily basis. Cancelling the licences would be hugely disruptive to customers, would strand productive assets (antenna towers, etc.) all over the country, and likely would be disastrous for the share prices of companies that figure prominently in many Canadians' investment portfolios and pension plan holdings.

Turning to the details of renewing a cellular or PCS licence, there are three broad questions to be answered:

1. What attributes should define the licence? (The time dimension really is the focal point here, rather than geography or bandwidth; a licence for Saskatchewan, for example, cannot be renewed as a licence for Prince Edward Island.)
2. What conditions should be attached to the licence to further public policy objectives?
3. What fee, if any, should be charged for the licence?

From the perspective of an economist or public policy analyst, the goal of the spectrum manager (Industry Canada) should be to select attributes, conditions, and fees that will be economically efficient (i.e., that will maximize the overall benefits to society that can be derived from the spectrum resources) and that will generate an appropriate return to the public for the use of the spectrum. While Industry Canada does generally espouse such objectives in its public statements, because decisions ultimately are made at the discretion of the Minister of Industry (a politician), other factors may come into play.

Section 4.1 – Licence Attributes

Prior work published by AIMS has argued that licences should have attributes that make them resemble property rights to the extent possible:

“The case for property-like spectrum licences is straightforward. If a licensee has certainty in spectrum tenure, then it constantly faces an incentive to invest in the complementary

infrastructure (antenna towers, system software, etc.) and to provide the best services that will attract and retain customers. If instead a licensee is approaching the end of a licence term and it is uncertain whether the licence will be renewed (or it is certain that it will not), then these incentives to provide the best possible services and to grow its customer base diminish.

If a licensee has the right to sell its spectrum to another party – and it must be remembered that all the licence conditions attached to the original licence would remain fully in effect for the buyer – without concern about delays while the Minister considers the political optics of the transaction, the opportunistic addition of new licence conditions, or attempts to tax supposed windfall gains, then economically efficient transfers will occur as original licensees sell to buyers who can make better use of the frequencies. If instead licences are not treated as property and transactions are subject to these forms of regulatory risk, then transfers will be deterred and spectrum may remain in second-best uses.

...

The more uncertainty that the government injects into future licence terms, the greater will be the disincentive for licensees to invest in new and better technology and service offerings (and the lower will be the initial auction revenues for such licences). Just as an auction market can determine the optimal distribution of licences initially, a secondary market (unencumbered by regulatory risk) can ensure an efficient distribution over time. The natural reluctance of politicians and bureaucrats to ‘let go’ must be overcome and spectrum licences should be made perpetual.”⁷

As alluded to earlier, however, the ability of Industry Canada officials to “let go” in this manner is constrained by the legislative underpinnings of the spectrum management program. The *Radiocommunication Act* prevents the Minister from fettering his own discretion, and therefore any policies, statements, licence conditions, etc., that Industry Canada may issue are subject to potential Ministerial override in the future.

⁷ *Chicken Little Eats Crow: How The Critics Got It Wrong About Spectrum Auctions*, Ian Munro, Atlantic Institute for Market Studies, October 2008, p. 20, <http://www.aims.ca/site/media/aims/ChickenLittleEatsCrow.pdf>.

Section 4.2 – Licence Conditions

In the consultation paper Industry Canada proposed the continuation of a number of largely technical licence conditions: the licensee must comply with existing Canadian and international regulations, legislation and agreements; the licensee must establish its radio stations in an appropriate manner (e.g., towers must have appropriate lighting to make them visible to aircraft); the licensee must provide access to law enforcement agencies for interception capabilities as authorized by law (“wiretapping”); and, the licensee must provide technical information on its radio installations to Industry Canada so that it has a current and correct technical database that can be accessed when dealing with site coordination and interference management issues. These conditions are not controversial and none of them were opposed by any party during the consultation process.

The licence condition that generated the most interest in the consultation comments was the requirement that a licensee spend two percent of its revenues on research and development.

It is interesting that in the consultation paper on cellular and PCS licence renewal, issued on March 23, 2009, Industry Canada proposed that this condition be retained, yet in its consultation paper on changes to its auction framework, issued only ten days later on April 2, 2009, the Department’s support is rather lukewarm:

“The R&D condition of licence requires that licensees submit annual audited R&D statements to the Department. Industry Canada recognizes that generating these reports places additional administrative and financial burdens on licensees. The analysis of these reports to date shows that the largest licensees have, on average, exceeded the 2% requirement identified in their condition of licence.

Industry Canada continues to recognize the need for the government ‘to stimulate research and development in Canada in the field of telecommunications and to encourage innovation in the provision of telecommunications services.’ The Department notes, however, that two recent reports, the *Telecommunications Policy Review Panel Final Report* and the *OECD Telecommunication Regulatory Institutional Structures and Responsibilities*, cautioned against the mix of regulation and industrial development strategy. Other areas of Industry Canada are recognized as being well placed to further this policy objective.”^{8, 9}

⁸ *Consultation on Revisions to the Framework for Spectrum Auctions in Canada*, Industry Canada, April 2009, pp. 9-10, [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/dgrb-001-09-eng.pdf/\\$FILE/dgrb-001-09-eng.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/dgrb-001-09-eng.pdf/$FILE/dgrb-001-09-eng.pdf).

No commenter argued explicitly for the retention of the R&D condition in their submissions.¹⁰ The position of the CWTA on this issue is similar to that of many of the commenters who participated in the consultation process:

“CWTA is of the view that the Research and Development condition is an artifact from a previous era that is no longer appropriate or required. It originated out of an expressed preference for Research and Development commitments contained in the original cellular licensing process. The condition was intended to encourage the growth of Canada’s domestic wireless telecommunications equipment, software, and services sectors, in what was at the time a nascent industry. The vibrant and growing wireless clusters that have since developed in Calgary, Montreal, Ottawa, Toronto, Waterloo and Vancouver demonstrate there is no longer a need for this artificial inducement. As a result of this condition, more than a billion dollars [were] invested since the first licences were issued. As the Department notes in the Consultation on Revisions to the Framework for Spectrum Auctions, wireless companies invest in research to remain competitive, and have generally exceeded the amount required by the condition of licence.

This condition adds a financial and administrative burden on licencees (*sic*) and suppresses network investment. Consumer demand for voice and data services is putting considerable pressure on the capacity of wireless networks. This is in turn driving significant investments in the capacity and speed of wireless networks. Given the current economic climate, and the government’s desire to make investments to stimulate the economy, licencees (*sic*) should be provided maximum flexibility to invest all available resources as they choose. To

⁹ It also is interesting that the consultation on the spectrum auction framework even discussed the R&D condition at all, as the existing framework document does not mention the issue. From its inception, the framework document was just that: an explanation of the broad framework for spectrum auctions, with the details – such as conditions of licence – of any particular spectrum band to be addressed within its own consultation and licensing process.

¹⁰ It should not be noted though that on this, as with any other issue that is the subject of a formal consultation process, there is nothing preventing any interested party from attempting to inform the Minister of its position outside the formal process.

CWTA's knowledge, no other jurisdiction applies a comparable obligation. CWTA recommends the Department discontinue this condition."¹¹

To summarize, Industry Canada itself no longer appears to fully support the research and development condition and the industry also is opposed to it. On the one hand the condition may be irrelevant – except for the administrative burden of documenting compliance – because some companies will decide it is in their own competitive and business interests to spend more than two percent of their revenues on research and development. On the other hand, for those firms whose business judgement leads them to conclude that a lower level of spending is appropriate, the imposition of this condition by the government could do real financial harm. It also is interesting to note that Industry Canada's own guidelines on compliance with this condition of licence state that the research and development need not be conducted within Canada.¹²

The research and development condition of licence either is a moot point or an unnecessary interference from a department that has other, better policy tools available to promote research and development in Canada. It should be discontinued.

Section 4.3 – Fees

In the consultation paper Industry Canada states that market forces are relied upon to promote the efficient assignment of spectrum and to earn a fair return for the Canadian public for the use of the spectrum resource. The Department also states that these principles are incorporated into the setting of licence fees by having fees that reflect the value of the spectrum licence. As well, it is government policy that the costs of Industry Canada's spectrum management program should be covered by fees charged to licensees, rather than being subsidized by taxpayers.

Market forces and prices do work well in making initial spectrum assignments: a properly designed auction process will tend to assign licences to those who value the spectrum most and are therefore willing to pay the highest price, thereby achieving economic efficiency, and will by definition generate a market-based price and thus provide fair compensation for the use of the spectrum in question.

¹¹ "Comments of the CWTA in response to *Canada Gazette Notice DGRB-002-09 - Consultation on the Renewal of Cellular and Personal Communications Services (PCS) Spectrum Licences*," Canadian Wireless Telecommunications Association, May 2009, pp. 4-5, [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/dgrb-009-09-CWTA-comments.pdf/\\$FILE/dgrb-009-09-CWTA-comments.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/dgrb-009-09-CWTA-comments.pdf/$FILE/dgrb-009-09-CWTA-comments.pdf).

¹² *Guidelines for Compliance with the Radio Authorization Condition of Licence Relating to Research and Development*, Industry Canada, 2007, p. 5, [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/gl03e.pdf/\\$FILE/gl03e.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/gl03e.pdf/$FILE/gl03e.pdf).

When spectrum is assigned on a channel-by-channel basis in a first-come-first-served environment (unlike the case of cellular and PCS licences), pricing can be a useful tool to provide users with the incentive to economize on their spectrum consumption. As with any resource or commodity, artificially low prices will lead to overconsumption, waste, and inefficiency. Many governments, including Canada's, have considered or attempted to establish spectrum licence fees (for non-auctioned spectrum) that would mimic market prices and thus provide spectrum users with market-like incentives to use spectrum efficiently.

Despite these good intentions, however, this is a very difficult task to accomplish with any sort of precision: how exactly is Industry Canada supposed to determine the market value of, say, a taxi radio licence in Winnipeg (along with thousands of other licences), and even if some estimate is developed, how much certainty is there that this estimated value will remain stable over time? Nonetheless, by setting fees sufficiently high so that potential users will at least take them into consideration when making demands for spectrum, there may at least be some benefit in terms of improved efficiency.

Alternatively, by vesting spectrum authorizations, including cellular and PCS licences, with property-like attributes, including transferability in the secondary market, the requirement to divine market values and set licence fees accordingly in the pursuit of efficiency gains is eliminated. The forces of demand and supply in the marketplace will establish prices and allow spectrum to naturally migrate to its highest-valued uses, just as with the vast majority of goods, services, and resources in our economy.

With the efficiency objective off the table, that leaves the "fair return" objective as a possible reason for assessing renewal fees on cellular and PCS licences. (As a group, cellular and PCS licensees already have paid licence fees and auction bids that in sum far exceed any reasonable long-term forecast of related spectrum management costs, thus cost recovery is not an issue.)

On this question, it is important to recall the distinction between the licences awarded via an auction and the licences that were awarded through other processes.

In the 2001 auction of PCS licences, the only payment required of winning bidders was the winning bid amount; no other fees were required. In the auction rules, Industry Canada listed the conditions that would apply to the licences of the winning bidders, including the following:

“1. Licence Term

The term of this licence will be ten years from the date of licence issuance. At the end of this term and any subsequent terms, the licensee will have a high expectation of renewal for a further ten-year term unless a breach of licence condition has occurred, a fundamental reallocation of spectrum to a new service is required, or an overriding policy need arises.

A public consultation regarding the renewal of the licence will commence no later than two years prior to the end of the licence term if the Department foresees the possibility that it will not renew this licence or if renewal fees are contemplated.”¹³ [Emphasis added.]

As the underlined text indicates, at the time of the auction, the Department was unclear about its own intentions with regard to possible renewal fees and was unable or unwilling to commit to any firm policy on the issue.

Industry Canada had three options to choose from at the time. First it could have clearly said that no renewal fees would ever be charged and that the winning bid amount was the only payment that would ever be required. Second, Industry Canada could have specified a renewal fee that would apply, e.g., the winning bidder would have to pay its full bid amount again beginning in year eleven (and in year twenty-one, etc.). Both these approaches would have provided bidders with certainty and could have been factored into bidders’ valuation models easily.

Instead, though, the Department chose to avoid the hard work of actually making a principled decision and punted the issue ten years down the road, creating a future policy headache for the Industry Canada officials of 2010 and a dark cloud of financial uncertainty for the licensees.

If the Department wishes to argue that additional renewal payments should be extracted from auction winners – who did pay full market value for their licences – so as to provide a “fair return” to the government’s coffers, then fairness also should be (or should have been) demonstrated on these points:

- Bidders should be treated fairly by having a clear sense of any renewal payments that will apply in later terms, rather than weasel-words about unknown payments that “may” come due in the future.
- If the Department wishes to retain the ability to levy a renewal fee because an analysis shows that the actual value enjoyed by a winning bidder exceeds its original winning bid (the “windfall”

¹³ *Policy and Licensing Procedures for the Auction of Additional PCS Spectrum in the 2 GHz Frequency Range*, Industry Canada, 2000, p. 43, [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/10.1e.pdf/\\$FILE/10.1e.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/10.1e.pdf/$FILE/10.1e.pdf).

argument), then provision should be made to provide a refund to bidders should the analysis show the opposite.

It is entirely appropriate that Industry Canada recoup a fair return for the use of spectrum assets, but a price determined through a one-time competitive auction is just that, a fair return.

It also is the case that administratively setting a renewal fee to reflect the market value of a spectrum licence is a difficult methodological task. Such a valuation analysis must be a forward-looking exercise and Industry Canada is not well placed to predict and evaluate licensees' business plans for the future.

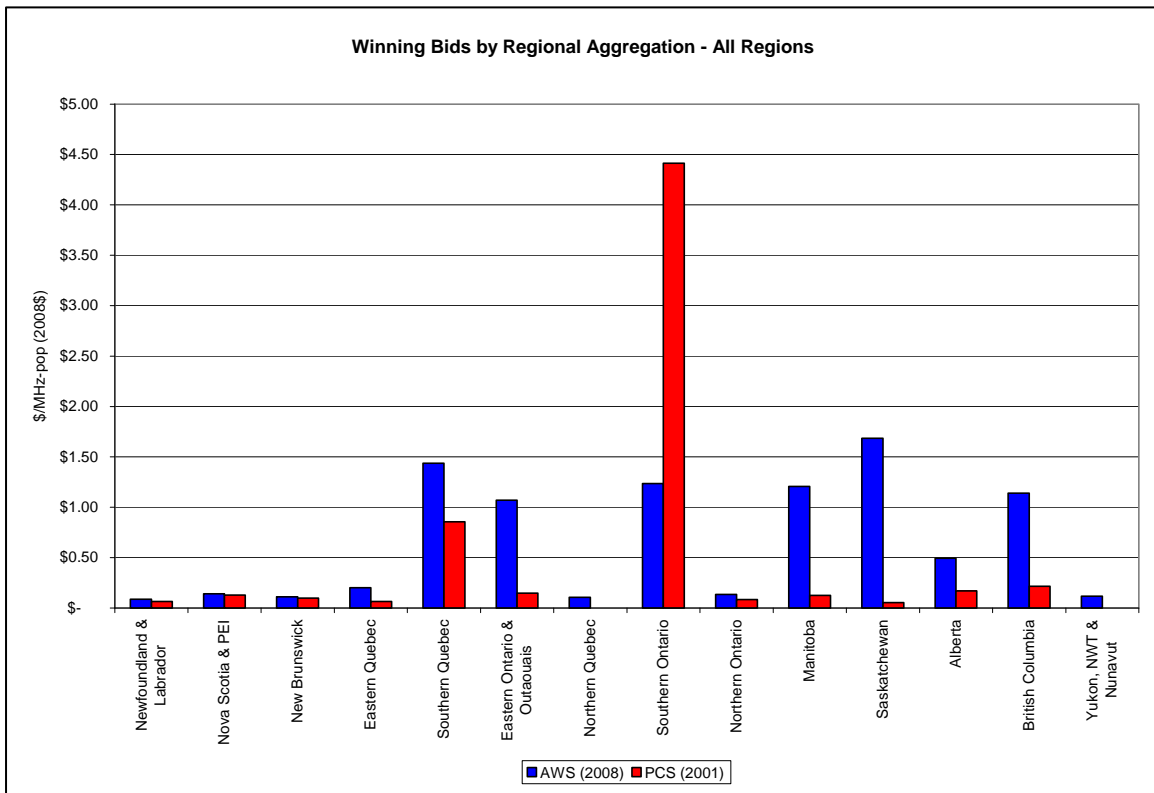
Estimates can be derived from proxy values – for example, if a 10 MHz licence covering New Brunswick is sold on the secondary market tomorrow for \$X, it may be reasonable to conclude that the market value of another 10 MHz licence for New Brunswick is approximately \$X – but such data points are few and far between. Secondary market transactions have been rare events to date, and there have been only two Canadian auctions of spectrum comparable to cellular and PCS frequencies, one of which occurred almost a decade ago. Given the specific contexts of each of those auctions – including the participation rules (the 2001 PCS auction featured a cap on how much spectrum any bidder could acquire and the 2008 AWS auction had some spectrum set aside for new entrants), the market structure at the time, the state of technology, the extent to which different bidders had or were pursuing different regional or national footprints, interest rates, and exchange rates – it is not clear how one would use such data to develop a reliable valuation for the business opportunity presented by a licence over the period April 1, 2011 through March 31, 2021. Figure 6 provides a quick snapshot view of how significantly values can vary across regions and across time periods. Note that this chart in fact *masks* the variances that may exist in the prices of subsidiary areas. For example, the figure shows an aggregated value for Saskatchewan in the 2008 AWS auction of \$1.68/MHz*pop,¹⁴ but the prices for the Moose Jaw, Regina, and Saskatoon licences that fed into this aggregated value ranged from as low as \$1.42/MHz*pop to as high as \$3.02/MHz*pop.

¹⁴ To facilitate comparisons of wireless licence, it is common to calibrate them according to the bandwidth of the licence (in megahertz – “MHz”) and the population covered by the licence (“pops”). If a 20 MHz licence covering an area with a population of 500,000 people sold for \$25 million, then the price of the licence may be referred to as \$2.50/MHz-pop.

Forecasts based on historical prices are particularly suspect in an industry, like wireless telephony, that features rapidly changing technology and consumer preferences. It was not long ago that no one had yet heard of Blackberries, iPhones (and their “apps”), or mobile social networking, for example. While the popularity of these new services and applications may drive revenue growth, they also are highly bandwidth intensive and thus costly network improvements may be required – including the purchase of additional spectrum in future Industry Canada auctions.

Furthermore, as the wireless marketplace expands in terms of geography (into remote and rural areas that are expensive to serve) and population (signing up those who have chosen not to use a wireless phone until now), the profitability of new customers may be relatively low. This will be exacerbated by the arrival of several new competitors in the marketplace, including three well-established cable companies (who already provide fixed line telephone and Internet service).

Figure 6



Things are somewhat different in the case of licensees who received their spectrum through non-auction processes. Throughout the lifetimes of these licences, some of which now have been renewed multiple times, it always has been clearly understood that an annual licence fee would be charged. There is nothing obviously unfair or unpredictable about similar fees being levied over the next term of these licences; however, for the reasons given above regarding the methodological difficulties in having Industry Canada assess the market value of these licences for the next ten years, any radical deviation from the current fee level appears unwise. In the event that the fee levels established by Industry Canada are below market value, there effectively is a transfer of wealth from the general public to the consumers of wireless services and/or the shareholders of wireless service providers. In the event that Industry Canada inadvertently sets fee levels materially above actual market values, the wealth transfer works in the opposite direction, and there may be real impacts on service providers' abilities to invest in infrastructure and innovation and to expand the range and reach of their services.

5. CONCLUSIONS & RECOMMENDATIONS

Access to high quality wireless services is important to a large segment of the Canadian population and is a key productivity driver to Canadian business and industry. As it decides upon the details of renewed cellular and PCS licences in 2011, Industry Canada should be mindful of the effects and distortions that its decisions may have on licensees' abilities and incentives to continue investing in their networks and infrastructure. (And to be fair, it should be stated that the Department has indeed made progress in moving towards an economically rational system of spectrum management over the past 15 years.)

In considering whether spectrum licences should be made more property-like, it is useful to look at wireline and wireless communications in parallel.

If John picks up his wireline phone in his right hand to call Mary who lives down the street, then the wireline service provider carrying the call will own the cables and wiring running down the street that connect John to Mary. That service provider is (largely) free to sell or lease that infrastructure to another party. The service provider is not required to spend on research and development according to the wishes of the government. The service provider does not have to come before the government every ten years to justify its right to provide service for another ten years, and it does not face the prospect of the government estimating a value for its business and imposing a fee for renewal of a licence to serve customers.

If instead John picks up his cellular phone in his left hand to place the same call to Mary, then the service provider carrying the call does not own one of the absolutely necessary assets required to provide the service: the radio frequencies. The service provider may have much more limited abilities to sell or lease its licence to use these frequencies. The service provider must spend a prescribed amount of money on research and development by order of the government, whether or not the service provider thinks that this represents a prudent business decision.

Furthermore, the service provider must go through a review process every decade to determine whether it will be allowed to continue its business, and potentially may receive a bill for millions or billions of dollars – the value to be determined through a government exercise in “fair market value” estimation – to be allowed to do so.

Industry Canada officials have been placed in a difficult predicament today because their predecessors ten and twenty years ago made sub-optimal choices in terms of licensing processes and licence definitions and attributes.

To ensure that the wireless telephony sector continues to maximize the benefits that can be produced for Canadians, existing licences should be renewed and should be made to resemble property rights to the extent possible.¹⁵ Licences that were acquired at auction for fair market prices should not be subject to renewal fees. Licences that were assigned through non-auction processes should continue to carry a fee, but radical changes to the fee level based on well-intentioned but ultimately unreliable future valuation estimates should be avoided.

Industry Canada should amend its auction framework so that the problems outlined in this paper can be avoided in future licensing processes. The licences offered in future auctions should have strong property right characteristics and there should be absolute clarity that the price paid in the auction is the one and only price to be paid for the auction, with no additional fees to be levied at any time in the future. This approach will both maximize the licensees’ incentives to develop their networks and service offerings and maximize the revenues that will be generated in the auction – a win-win for all Canadians.

Unfortunately, many of these recommendations cannot be implemented simply through a change of policy. The foundation for spectrum management, as specified in the *Radiocommunication Act*, leaves significant discretion in the hands of the Minister of Industry who is legally prohibited from extending certain forms of market certainty to licensees, which undermines the concept of a true property-rights approach.

¹⁵ For a detailed treatment of this issue that echoes many of the recommendations made here, see *Study of Market-based Exclusive Spectrum Rights*, McLean Foster & Co. in collaboration with Prof. Martin Cave, Robert W. Jones, and Dr. William Lehr, 2007, [http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/market_based_rights-droits_axes_sur_le_marche-eng.pdf/\\$FILE/market_based_rights-droits_axes_sur_le_marche-eng.pdf](http://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/market_based_rights-droits_axes_sur_le_marche-eng.pdf/$FILE/market_based_rights-droits_axes_sur_le_marche-eng.pdf).

In order to fully realize the potential benefits described in this paper, institutional and statutory change is required. As recommended in another AIMS publication,¹⁶ the spectrum management program should be transferred to the CRTC, an independent arms-length body, and the CRTC's mandate should be revised to incorporate a market- and property-rights based approach to spectrum licensing, pricing, and regulation.

¹⁶ *The End of That 70s Show: Rethinking Canada's Communications Regulatory Institutions for the Twenty-First Century*, Ian Munro, Atlantic Institute for Market Studies, October 2009, <http://www.aims.ca/site/media/aims/Communications.pdf>.



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