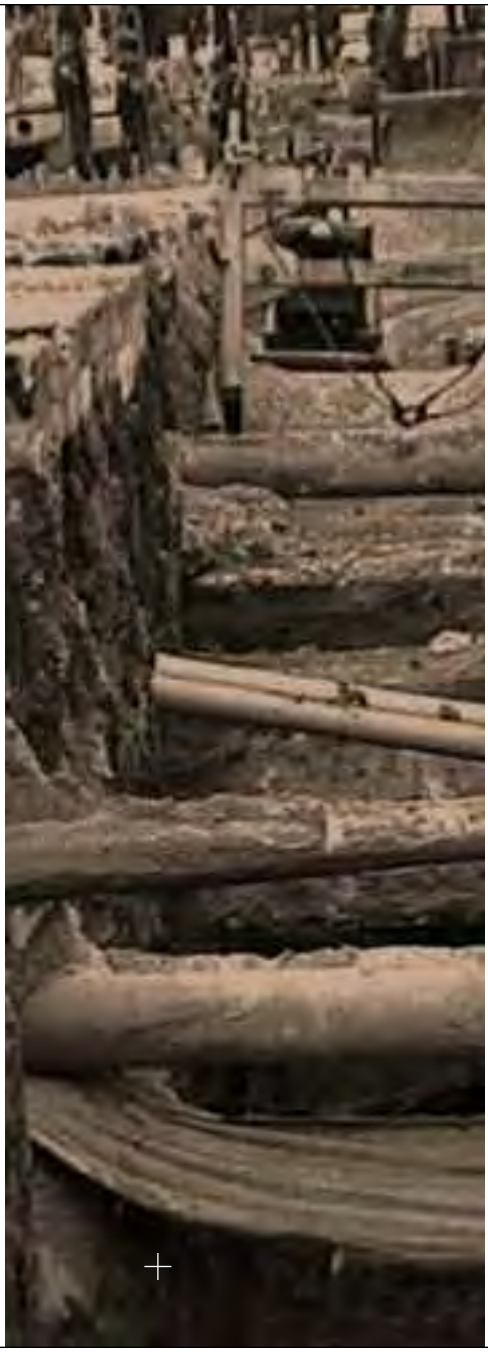

Perfect Storm:

How New Technologies and Foreign Investment In Canada's Telecommunications Industry Will Affect Municipalities

April 2010

FCM | Federation of Canadian Municipalities

Federation of Canadian Municipalities
24 Clarence Street
Ottawa, Ontario K1N 5P3

An electronic copy can be downloaded from www.fcm.ca.

For more information, please contact
Adam Thompson, Policy Analyst
Telephone: 613-907-6247
athompson@fcm.ca

TABLE OF CONTENTS

BACKGROUND

Will a surge in foreign investment in telecommunications infrastructure lead to increased costs to municipalities to accommodate increased access to municipal rights of way?

For the municipal sector, the real question is "Will the federal government's stated objective of increasing the scope of foreign investment in Canadian telecommunications unleash another wave of new investment in infrastructure similar to that post-1993? And will that will put comparable pressure on municipalities to accommodate the increase in telecom companies seeking access to municipal rights-of-way (ROW)?" This brief paper sets out to provide some answers.

The 1993 *Telecommunications Act* unleashed a wave of new telecommunications investment in basic infrastructure. Much of it involved putting new cables, towers, switching facilities and access ducts into new and existing municipal utility spaces.

Canadian cities, used to dealing with just one telecommunications company—Bell or a provincial monopoly—in a relationship that spanned decades, were unprepared for the onslaught of new, aggressive private companies. Their approach to issues of access differed considerably in terms of cost and timelines from that of Bell and other provincial telephone companies, such as Sasktel and the Manitoba Telephone Company (now known as MTS Allstream).

A recent publication by the Federation of Canadian Municipalities (FCM) summarizes the relations between municipalities and monopoly telephone companies, dating back to the 1899 *Railway Act*.[1] The legal language of late Victorian Canada, including the most relevant article, Section 43, was in essence copied into the 1993 *Telecommunications Act*, leading to the unintended consequence of "limiting municipal property rights in order to facilitate profit-making by private business ventures."

As will be explained later in the report, the initial "balance of power" in terms of negotiations between municipalities and private telecommunications companies lay, legally at least, with the latter.

As a result of the 1993 *Act*, the Canadian Radio-television and Telecommunications Commission (CRTC) asserted jurisdiction over municipal right-of-way issues as they pertained to telecommunication infrastructure (it may have had jurisdiction already but it was not exercised). The leading decision so far has been *Ledcor v. Vancouver* (2001).[2] The *Ledcor* principles shifted a substantial part of the cost of installing telecommunications infrastructure to the municipalities themselves.

According to FCM, "This subsidy has cost property tax payers in larger cities $646 million since 2001, or about $107 million per year. The issue stems from the legislative regime that governs the

1 "Dealing with Telecom Companies: Protecting Municipal Rights-of-Way: A Handbook for Municipal Officials," Federation of Canadian Municipalities, June 2009, www.fcm.ca
2 *Ledcor/Vancouver* – Decision CRTC 2001-23. Note that the full versions of all CRTC decisions are available on the Commission's website at www.crtc.gc.ca

installation and maintenance of privately owned telecommunications ducts and cable beneath municipal roads. This practice results in significant ongoing costs for municipal governments that they cannot recover because of federal regulatory control. Under the current regime, municipal governments have lost both the ability to control their own rights-of-way (ROWs) and the ability to recover the ongoing costs imposed on them when telecommunications companies dig up public roads and install their equipment in public ROWs."[3]

A subsequent CRTC ruling, *MTS Allstream v. Vancouver* (2009), has provided a clearer guide to the costs that municipalities can recover from telecommunications companies that are accessing municipal ROW and engaging in various construction activities that require municipal oversight, approval and monitoring, with all the related expenses including a "loading factor" designed to capture largely "soft costs" for which the expense of quantification exceeds the value of the costs incurred.

3 "Highway Robbery: How Federal Telecom Rules Cost Taxpayers and Damage Public Roads," FCM, June 2008.

SNAPSHOT OF THE TELECOM INDUSTRY

As Industry Canada notes, "The restructuring of the industry continued. Evolving technologies, consumption patterns and regulations have all played a role in the restructuring of telecommunication services industries and the financial performance of its various segments in the recent past. In 2006, mergers, acquisitions and labour force restructuring also had a significant impact. These organizational changes occurred as many companies were trying to improve or maintain profitability. In addition, the ever-growing popularity of wireless telecommunications and increased competition in the fixed telecommunication market are broad trends that continued to dominate the landscape."[4]

The sector continues to comprise a significant portion of the Canadian Gross Domestic Product.

Telecoms and GDP

The ICT sector contributed $59.2 billion to Canadian GDP (in 2002 constant dollars) in 2008, accounting for 4.8 per cent of Canadian output, up from 4.2 per cent in 2002.

In 2008, the ICT sector was a key driver of national growth with an increase of 2.7 per cent in GDP. On average, annual growth in this sector has been 4.7 per cent since 2002, almost twice as fast as the overall economy (2.4 per cent). This faster growth also means that the ICT industries have accounted for 8.9 per cent of the Canadian GDP growth since 2002.

For a fourth consecutive year, the ICT manufacturing industries grew, up by 1.1 per cent in 2008. A strong growth rate was observed in the wireless communications equipment (19.3 per cent). Led by the computer systems design (3.8 per cent), GDP in the ICT services industries increased by 2.9 per cent in 2008. Continued growth in output was observed in the ICT wholesaling industries (9.6 per cent) in 2008. Both the services and wholesaling sub-sectors have displayed continuous growth since 2003.[5]

Industry Canada's survey of investment intentions suggests that even though the recent financial downturn has slowed new commitments, capital expenditures should soon rebound.[6]

ICT capital expenditures decreased by 3.7 per cent in 2008, reaching an estimated $11 billion, and are anticipated to grow by 1 per cent in 2009. This would bring total capital expenditures by the Canadian ICT sector to $11.2 billion. Still, that is more than 11 per cent lower than 2002's expenditure level. ICT capital expenditures intentions account for 4.7 per cent of total Canadian investment intentions for 2009, but this share has been steadily declining since 2002, when ICT's capital expenditures accounted for 7.9 per cent of total Canadian investments.

In 2009, capital expenditure intentions for the ICT services industries are valued at $9 billion, a 0.5 per cent decrease from the previous year.

4 Statistics Canada, Service Bulletin, Broadcast and Telecommunications Industry, 38-1, September 2008.
5 ICT Sector Bulletin, Information and Communications Technologies Branch, Industry Canada, August 2009.
6 Information and Communications Technologies Statistical Overview (http://www.ic.gc.ca/ict) Information and Communications Technologies Branch Spectrum, Information Technologies and Telecommunications Sector Industry Canada Last Update: April 2010 Survey conducted from October 2008 to January 2009.

Investment by the ICT manufacturing industries are expected to increase in 2009 by three per cent to $764 million. This is still nevertheless 18.1 per cent lower than 2002 level of $933 million. However, since 2004 capital expenditures have been growing at a compound annual growth rate of seven per cent."

Yet, the recovery of post-2009 capital expenditures spend cannot mask the growing trend of declining investments in Canada and developed countries overall. This is the result principally of three factors: completion of broadband rollout programs; mobile sector saturation and technology uncertainty; and operator margin pressure due to competition.[7] Still, as a leading analyst points out, the importance of the industry will hardly diminish.

"Despite a challenging financial environment, Canada's telecommunications industry has been planning and expending substantial sums for capital investment in infrastructure, laying a foundation for the nation's participation in the global information economy. The major carriers have plans to spend $8.5 billion in capital in 2009, including investment that broadens the reach of their networks and accelerates transmission speed. This is in addition to the billions of private-sector dollars that have already been invested since residential broadband services were first launched in the mid-1990s. New entrants in Canada's mobile sector have announced billions more in capital in 2009 and 2010, hiring thousands of new employees."[8]

The general public policy corollary is that the lead regulator, the federal government, must not undermine the conditions for future growth and development. At the same time, the federal government has also to recognize that the telecoms are private companies, which can impose social costs that may be borne by the taxpayers, particularly at the municipal level.

Snapshot of Telecom Revenues[9]

Key Highlights

Overall telecom service revenues have grown around five per cent a year to about $4 billion. The majority of the growth was accounted for by the wireless (15 per cent growth) and broadband (18 per cent growth) sectors. In contrast, long-distance revenues fell by seven per cent. It is estimated that wireless and broadband together accounted for over 50 per cent of total telecom industry revenues.

Smaller competitors accounted for about 15 per cent of residential and business lines. Cable companies in particular made significant inroads into local telephony markets, securing approximately 10 per cent of total residential lines.

Despite strong growth in wireless revenues, the growth in wireless subscribers continued its downward trend into single figures. Compared with other OECD countries, wireless penetration is low, about 60 per cent, despite almost total coverage, leaving significant room for growth.

By mid-2007, more than 85 per cent of Canadian households with Internet access used broadband connections. However, in terms of overall broadband penetration, Canada's position in the OECD has slipped from second place in 2002 to ninth place in 2006.

VoIP continued to grow rapidly. The combined cable digital telephony subscribers of Vidéotron Ltée, Rogers, Shaw Cablesystems and Cogeco increased from around 200,000 at the end of 2005 to around one million by the end of 2006, and to over 1.6 million at the end of 2008, the last year for which data is publicly available.

7 "Telecommunications and Capital Investments: Looking Beyond the Financial Crisis 2010-2015," The Insight Research Corporation, Boston, Mass., March 2010.
8 "Lagging or Leading: The State of Canada's Broadband Infrastructure," Mark Goldberg and Associates, 2010
9 BuddeComm 2008 estimates at http://www.budde.com.au/Research/2008-Canada-Telecoms-Wireless-and-Broadband.html)

Growth in digital TV services has been slower than initially predicted. Subscriber numbers increased by only 10 per cent per year.

Wireless spending by Canadian consumers will grow faster than all other expenditures on communications services over the next five years, according to a recent report aimed at network service providers.[10]

Forecast wireless subscribers, penetration and revenue growth, 2008 – 2013			
Year	Subscribers	Penetration	Revenue ($ billions)
2008	21,300,000	64 per cent	16.6
2009	23,200,000	69 per cent	19.0
2010	25,300,000	74 per cent	21.6
2011	27,600,000	80 per cent	24.6
2012	31,100,000	86 per cent	28.1
2013	32,800,000	93 perr cent	32.0

In its forecast of spending on voice, Internet, T.V. and wireless services, IDC Canada, a consultancy, predicts spending on wireless will increase from $8.4 billion in 2009 to $11.9 billion by the end of 2011. Consumer spending on wireless data services alone is expected to grow from just over $1 billion at the end of last year to $2.75 billion in five years. By then, the penetration of cellular will have reached more than 76 per cent of the population. IDC Canada estimates consumers outnumber business cell-phone users by two to one.

Municipalities will face increasing downstream demand for aerial access (antenna towers) from competing companies.

10 IDC Canada 2010 forecast at www.idc.ca

COMPETITION IN THE TELECOM INDUSTRY

Since its inception, the telecommunications industry in Canada has been organized by the federal government as a monopoly. Designated a "natural monopoly," telecommunications, in the eyes of federal regulators, required such economies of scale and scope that only a single firm could deliver the desired service. Under such constraints, competition was judged inefficient and ineffective.

The federal government, in order to prevent monopoly firms from exercising market power over captive customers, imposed detailed price and essential service regulations. The reason was not just to bolster the so-called efficiencies available to monopoly firms, but also to advance social-policy objectives such as universality of access. An intended consequence is that the monopoly firms did not face either domestic or international competition.

Starting in the 1980s, the idea of telecommunications as a natural monopoly came under scrutiny, as technology advanced and numerous examples of successful privatization appeared on the international stage. As a result of the 1993 *Telecommunications Act*, the CRTC began a series of exploratory discussions. As of late, the pace of competition appears to be picking up in Canada as the CRTC reviews underlying regulatory conditions with a view to removing barriers to new entrants, a trend not necessarily welcomed by the large incumbent companies that account for well over 80 per cent of existing telephone and Internet service.[11]

In 2006, the CRTC initiated the *Review of regulatory framework for wholesale services and definition of essential service*, which could dramatically alter how competition in telecom services may evolve in response to both policy demands and consumer expectations.[12] In 2008, the Competition Bureau also initiated a study of competitiveness and foreign investment that included the telecommunications industry.[13]

It is now generally acknowledged that lack of competition has contributed to Canada's overall under-investment in machinery and equipment (M&E), training and innovation, in fact all of the underlying drivers of productivity in telecommunications. Canadian workers have about half the amount of information and communications technology (ICT) of their American counterparts.

The Canadian telecommunications industry is best described as a regulatory approved oligopoly. There are three major players, Bell, Telus and Rogers, with two new entrants, Shaw and MTS Allstream in Western Canada, and, potentially, Wind/Orascom. There are a number of "flanker" brands, such as Virgin and Dave, but they are essentially owned by the big three.

The companies tend to stake out turf and respect the others' turf; hence there is limited head-to-head completion, at least on price, and prices charged to consumers are relatively consistent across all three major companies. Moreover, the companies tend

11 www.mhgoldberg.com/blog/2007/10/setting-conditions-for-telecom.html
12 Also described as "the policy review," CRTC Telecom Public Notice 2006-14 available www.crtc.gc.ca
13 "Compete to Win," R.J. Wilson Chairman, Competition Bureau, June 2008, at www.ic.gc.ca/eic/site/cprp-gepmc.nsf/eng/home

to segment the market among entry users, business users and heavy Internet users. A bewildering array of contractual "packages" make cost-comparisons exceedingly difficult and are generally beyond the expertise of consumers. Not surprisingly, the Organization for Economic and Development Cooperation (OECD) reports that Canada has among the highest costs for cellular and Internet usage in the world.

Although disputed strongly by the industry, it is altogether likely on an effective basis, as opposed to reported entry-level plans, that Canada actually has the most expensive telecommunications system in the developed world, given the plethora of additional fees beyond basic charges.

Not surprisingly, the OECD reports that the level of adoption of advanced cellular and Internet services in Canada is declining. Simply put, the major telecommunication players have priced their services at a level that discourages use.[14]

Table 1
OECD Mobile Medium-usage Basket, August 2008, Tax Included[15]

	Fixed	Usage	Messages	Total (US$ PPP)
Netherlands	131.44	0.00	0.00	131.44
Finland	7.17	85.43	38.84	131.44
Sweden	124.89	0.00	13.04	137.94
Denmark	3.59	120.62	18.48	142.68
Norway	0.00	133.39	31.93	165.33
Iceland	196.04	0.00	0.99	197.03
Austria	0.00	137.82	61.82	199.64
Luxembourg	0.00	145.88	60.38	206.26
New Zealand	248.12	6.46	1.44	256.02
Switzerland	7.21	225.27	34.60	267.08
Japan	255.45	12.04	0.00	267.49
Poland	134.57	67.05	67.65	269.27
Turkey	211.75	54.01	3.58	269.34
United Kingdom	262.06	7.63	2.33	272.02
Hungary	309.03	0.00	0.00	309.03
OECD	193.75	89.62	34.39	317.77
Ireland	296.73	31.83	1.71	330.26
Australia	37.84	224.98	70.17	332.99
Korea	236.55	87.10	16.49	340.13
Portugal	38.85	281.09	50.42	370.35
France	317.09	48.16	12.77	378.02
Italy	0.00	291.44	102.82	394.26
Greece	364.90	0.00	35.93	400.82
Germany	270.67	0.00	134.53	405.20
Mexico	365.24	9.50	42.87	417.62
Slovak Republic	302.10	140.76	34.61	477.46
Czech Republic	331.24	114.06	39.03	484.34
Canada	461.66	35.28	3.69	500.63
Spain	9.60	364.51	134.15	508.26
United States	635.85	0.00	0.00	635.85

14 OECD Annual Communications Outlook, August 2009 at www.oecd.org
15 OECD Annual Communications Outlook, August 2009

The basic theme of the OECD report was reiterated in a related study conducted at Harvard University. As the CBC reported in October 2009, "Canada has some of the poorest high-speed Internet service in the developed world and is an example of what not to do from a policy perspective, according to a study by Harvard University.

The 232-page study, commissioned by American regulators and released Wednesday evening, found that Canada rates poorly compared to peer countries when measures such as national broadband adoption, network capacity and prices are taken into account.

Canada was 22nd overall out of 30 countries surveyed by Harvard's Berkman Center for Internet and Society. Canada ranked 16th on broadband adoption, 20th on speed and capacity, and 25th on price. Japan, Sweden and South Korea headed up Harvard's rankings, while the United States placed above Canada at 13th overall.

Canada "is often thought of as a very high performer, based on the most commonly used benchmark of penetration per 100 inhabitants," the study said. "Because our analysis includes important measures on which Canada has had weaker outcomes—prices, speeds and 3G mobile broadband penetration—in our analysis it shows up as quite a weak performer, overall."

"Early aggressive facilities-based competition certainly made Canada an early starter, but it does not seem to have enabled it to maintain its standing," the report said. "The Canadian experience suggests that reliance purely on competition between strong cable incumbents and telephony incumbents may be insufficient to sustain high penetration or achieve high capacity and low competitive pricing in the long term."[16]

A consultant's report prepared for Canadian telecommunication companies strongly refutes the OECD and Harvard claims regarding access and adoption. The study had a less effective rebuttal to the level of costs that Canadians pay relative to other jurisdictions. Most recently, the major companies have initiated per megabit billing and throttling techniques that will seriously impede affordability. The companies' rationale is commercially obvious: they do not want to invest ahead of the revenue stream. Simply put, Canadians pay the highest prices and have adjusted by curtailing adoption, although other factors clearly play a role and the entire causation cannot be attributed to price.

According to a recent article in the Montreal Gazette, "What's really happening is that technology is moving at such a pace that regulators can't keep up. Just look at wireless communications. The adoption rate in Canada for wireless lags behind many other developed economies. That's not an accident when you consider the restrictions on capital and technology imposed by our current rules."[17]

Canada has the potential to absorb a fair degree of additional investment in its telecommunications industry and infrastructure if adoption rates could be increased through more competitive pricing.

This is just one area where new foreign investors may pose a challenge to municipalities. The forecast telecommunications investment will in the near future be heavily skewed towards the wireless sector. More towers and relay stations could be constructed, all of which would have an impact on municipalities and their residents primarily because of concerns of site selection and liability.

16 "Canada Broadband Blasted by Harvard Study," CBC, Oct. 15, 2009, available at http://www.cbc.ca/technology/story/2009/10/15/harvard-fcc-broadband-study.html
17 http://www.montrealgazette.com/business/everyone+agrees+with+CRTC+chief/2912703/story.html#ixzzolQGcloDk

The level and amount of new foreign investment is difficult to forecast, since it will depend on a number of factors, not the least of which is the final federal decision on foreign ownership. As a rough guide, if foreign investors were to seek 15 per cent of the Canadian market, the resulting infrastructure investments could reach $1 billion, which represents that same percentage of current investment.

Currently telecom companies spend about $9 billion a year in infrastructure and an additional 15 per cent would bring the total to around $10 billion a year. It is likely that start-up costs would boost that amount, at least initially. The decisive factor would be the terms and conditions allowed by federal regulators. Although they are anxious for new investment, they are also reluctant to see effective foreign ownership, particularly if such has implications for cultural industries.

FOREIGN INVESTMENT RULES

For some time, the federal government has indicated the need for more competition in the telecommunications sector. According to legislation, the Competition Bureau is responsible for the state of market competition in the telecommunications industry. However the Competition Bureau has traditionally not applied tests used to determine the presence of market dominance to the industry.[18]

To address the challenge of both competition and a lack of new investment capital in the telecommunications industry, the federal government announced in its March 2010 Budget that it would look into the issue of opening up Canada's telecommunications industry to foreign investment.

The Budget announcement built upon a series of signals sent during the years since the Conservative government took office. Two years earlier, then Industry Minister Maxime Bernier announced"... an ambitious policy agenda for the telecommunications sector, the essence of which is a new regulatory framework that is more modern, flexible and efficient...Canada's New Government has changed the CRTC decision to accelerate deregulation of retail telephone prices of the traditional telephone companies. Consumers should benefit from more choices, improved products and services and lower prices. The revised decision also increases reliance on market forces, which will further encourage innovation and competition in the telecommunications industry."[19]

Under the existing rules, foreign investors can acquire up to 46.7 per cent of any telecommunications company. Not surprisingly, the degree of foreign investment in Canadian telecommunications is low, restricted mostly to foreign investors purchasing retail amounts of Canadian telecommunications stock. Large institutional investors, primarily in the United States, do hold Canadian telecommunication shares in their portfolios but not enough to be able to exert a strong "shareholders" voice. The shares are valued for their stability rather than their rate of return.

The content of the federal government's plan to open up the sector to foreign investment has yet to be announced, and at the time of writing Parliamentary hearings are underway. There is as yet no indication of whether foreign investors could take a majority position.

What is known is that the government has indicated that Section 116 of the *Income Tax Act* will be substantially removed. Section 116 tax clearance posed a significant barrier to Canadian companies seeking foreign investment.[20] If a U.S. venture capital fund invested in a Canadian private

18 OECD report, http://www.oecd.org/dataoecd/34/50/1920287.pdf Competition in Telecommunications 1995, "The Director of Investigation and Research under the *Competition Act* has statutory authority to intervene before the CRTC and make representations in respect to competition. The Director has made extensive use of these powers over a period of several years. The Director's submissions to the Commission are made on an arm's length transparent basis. Jurisprudence under the *Competition Act*, known as the "regulated conduct defence," has limited the application of the *Competition Act* to the telecommunications industry, at least in the area of criminal conduct. The courts have not yet had an opportunity to determine if the defence would apply in the same manner to civil matters subject to adjudication by the Competition Tribunal. The gist of this defence is that specific activity carried out pursuant to a valid scheme of regulation is deemed to be in the public interest. The *Telecommunications Act*, however, provides the CRTC with the authority to forbear from regulation where it considers that competition is sufficient to protect the interests of users.

19 Speech by Minister of Industry Maxime Bernier, April 4, 2007, http://www.ic.gc.ca/eic/site/ic1.nsf/eng/02124.html

20 See Analysis in ITBusiness.ca, March 5, 2010, www.itbusiness.ca/it/client/en/home/News.asp?id=56670

technology company and then sold the shares of that company, Canada required them to go through a Section 116 clearance process.[21]

The hundreds or even thousands of investors in a venture capital fund were required to provide information to Revenue Canada to determine whether they were subject to taxation on any gain from the sale of the shares. The requirement meant that foreign investors not only had to file a Canadian tax return but also had to face expensive documentation requirements. As a result, most investors shied away from Canada and have undertaken riskier but easier investments in developing markets offering a higher rate of return.

In mid-April 2010, the Chairman of the CRTC, Konrad von Finckenstein, said that in his opinion the percentage of foreign ownership could rise to 49 per cent but no further. He insisted that a foreign-investment vehicle should not "own" a Canadian telecommunications company. Chairman von Finckenstein's comments reflect a fear that Canadian companies could become "branch plants" of foreign companies, weakening Canadian cultural industries. This fear of foreign investors appears to be largely a Canadian concern. Most developed countries, other than South Korea and Japan, have largely removed restrictions on foreign investment in telecommunications. Most comparable to Canada is the United States. There, the Federal Communications Commission (FCC) has the right to question and block foreign investment of over 20 per cent in a U.S.-based telecommunications company. However, it has never invoked the rule and has allowed substantial foreign investment.

The incumbent companies are not necessarily opposed to opening up the industry to competition and new foreign investment, but they want the scope of the reforms to cover all telecommunications, not just cellular phone service. This would allow established companies to continue to share resources among service lines.

Although the major companies have faced accusations of cross-subsidization, this is exceedingly difficult to verify. More importantly, it is not clear that, even if true, it is not legally permissible. Chairman von Finckenstein said in his remarks to the House Committee that while the CRTC had studied the issue in its 2006-2007 review, the *Telecommunications Act* and the *Broadcasting Act* are separate legislation with separate regulators.[22]

The call by the major companies for a loosening of foreign-ownership restrictions in all sectors, not just cellular, is also a response to the one significant development in terms of foreign ownership of Canadian telecommunications: the emergence of the Wind Group.[23]

Backed by the Egyptian-financed Orascom Group and acting on a signal that the federal government would open the telecommunications sector to foreign investors, the Wind franchise bid successfully for spectrum rights in the Industry Canada spectrum auction. Although Wind/Orascom was deemed a domestically controlled entity for purposes of the auction, the CRTC subsequently ruled that it did not qualify as a majority Canadian-owned entity. It took a special order of the federal Cabinet to allow Wind/Orascom to exercise its spectrum rights.

Reinforced by a loan of reportedly US$440 million, Wind has now begun soliciting customers in large urban areas. Given its discount pre-paid model, analysts predict the company may attract up to 15 per cent of the Canadian market share in cellular communications.

21 Information Circular, 72-17RS, March 2005, Canada Revenue Agency at http://www.cra-arc.gc.ca/E/pub/tp/ic72-17r5/ic72-17r5-lp-e.pdf
22 See Speaking Notes at www.crtc.gc.ca/eng/com200/2010/s100413.htm
23 See interview with Wind CEO, Ken Campbell, at http://kempton.wordpress.com/2010/03/31/wind-mobile-calgary-service-review-interview-with-wind-ceo-ken-campbell/

FUTURE DEMAND AND TRENDS

The effective future of the Internet as a commercial, educational and governmental service lies beyond traditional cell phone service, which has already reached the saturation point. Rather, the future of the Internet lies in services, such as e-commerce, e-health, e-education and, dominantly, the distribution of e-games, movies, music and other entertainment products.

For those products, the one-to-two gigabit capacity of fibre-optics is essential. Existing copper, coaxial cable and even satellite services do not have sufficient bandwidth to deal with these applications. There is some chance that the next generation of satellites may be able to handle these data loads, but they may compete on the scope of their range, not on price. While this is in an issue for rural users, the bulk of potential clients, reflecting Canada's population distribution, are in the cities and theoretically within fibre range. That is particularly true of heavy commercial users.

The demand for future access to the Internet, particularly through, for municipalities, the more intrusive fibre connections, can be predicted to grow almost exponentially for three reasons. These are population growth in municipalities; expected new residential construction; and the growing percentage of consumers wanting a strong resilient and high-bandwidth Internet connection. As more people become aware of the possibilities and the need to keep up with the competition, both in the U.S. and Europe, what was once seen as a luxury will become a necessity.

Market players have generally tended to underestimate the demand for new services. The cell phone is a classic example of this tendency. The first service providers calculated that only business users would be interested and therefore allowed consumer-oriented companies into the networks, thinking they would achieve only a small market penetration. The consumer companies ended up taking over the market. Facebook and YouTube did not exist five years ago; today they are arguably two of the largest users of bandwidth.

POPULATION GROWTH IS ROBUST IN CANADIAN METROPOLITAN AREAS

Vancouver, Toronto, Montreal, Calgary, Ottawa and Halifax will continue to lead Canada in population growth. While the federal government continues its policy concern over rural access, most Canadians live in the major cities. Immigrants move to these cities and rural residents gradually migrate to them, often after spending some time in smaller regional cities.

Table 2*
Projected Population Growth to 2031 by Province[24]

Canada 32,270.5 (2005) to 41,810.8 (2031)
Newfoundland and Labrador 516.0 to 526.0
Prince Edward Island 138.1 to 157.0
Nova Scotia 937.9 to 1,026.7
New Brunswick 752.0 to 797.7
Quebec 7,598.1 to 8,884.4
Ontario 12,541.4 to 17,474.2
Manitoba 1,177.6 to 1,446.5
Saskatchewan 994.1 to 1,022.9
Alberta 3,256.8 to 4,402.8
British Columbia 4,254.5 to 5,943.6
Yukon 31.0 to 35.7
Northwest Territories 43.0 to 57.7
Nunavut 30.0 to 35.6

**Note: Figures are in thousands.*

The primary impact of population growth will be a growing demand for new housing. Canada's major cities, which will see the bulk of the population growth from immigration, internal migration and natural population growth, are particularly suited for new telecom infrastructure investment. The degree of density is a countervailing cost factor to the cost of managing expansion of equipment in established areas. Canada's urban density is actually about three to five per cent higher than that of the United States (excluding New York City as a density outlier).

24 Statistics Canada, Population Projections for Canada, Provinces and Territories 2005-2031 Catalogue no. 91-520-XIE, 2008.

NEW FIBRE TECHNOLOGY

Population growth is also reflected in projected engineering-related construction, much of which can be attributed to investment in telecommunications infrastructure.

Much of the new engineering expenditures will initially be on aerial services (towers) to support cellular phone services. However, as the market becomes saturated, investment and engineering will gradually shift to fibre cable installation, as companies attempt to reach wider coverage in the Fibre to the Home (FTTH) and Fibre to the Building (FTTB) market.

Besides enabling higher speeds of Internet connectivity, FTTH will support multiple High-Definition T.V. (HDTV) signals and voice over a common integrated connection, giving companies an ability to compete more effectively against the higher speed offerings and bundles from cable companies. By 2015, global expenditures on underlying Passive Optical Networks (PON) are expected to reach 7.6 billion annually.[25]

A number of smaller companies deploy fibre to the premises in apartment buildings and residential developments. Among them, Novus operates in a number of apartments in Vancouver and has had a few projects in Ontario and Quebec. As of year-end 2008, however, FTTH and FTTB represented a negligible share of the Canadian residential broadband market. The OECD reported zero penetration. Companies active in the industry in Vancouver, where most of new construction has taken place, suggest that up to five per cent of the market does have access to FTTH/B, but those are only new multi-family residential units.[26]

Fibre cables are usually placed along utility rights-of-way and through alleyways using underground construction. Crews use directional boring construction to dig a vertical hole, place a bit in the hole and drill a horizontal line to the next connection. This type of construction minimizes the disruption to the community and to homes and yards. Some of the downsides to placing fibre to the home will be the construction through the yard as the fibre is buried usually six to eight inches below the surface. Deeper ground installations are avoided so as not to intersect with other utility access ducts.

In the United States, costs of Fibre to the Home (FTTH) are falling rapidly, particularly with the use of aerial relays to avoid in-ground construction.[27] However, conditions in most Canadian cities have led most Canadian telephone companies to use buried cable because of the risk of ice damage and to conform to urban community aesthetics.

As of March 30, 2009, Verizon, the U.S. provider Verizon, had connected more than 3.3 million homes with its fibre service called FiOS. While Verizon is the largest provider by a large margin,

25 See Electronics.ca article on release of PON forecast at www.electronics.ca/presscenter/articles/1262/1/Global-Passive-Optical-Network-Equipment-Market-Projected-to-Reach-762-Billion-by-2015/Page1.html
26 Interviews conducted for this report
27 Columbia Telecommunications Corporation, "Fiber Optics for Government and Public Broadband: A "Feasibility Study", January 2007, p. 135. As cited in "Homes with Tails" (November 2008) by Derek Slater and Tim Wu, the study examined the cost to connect 200,000 homes in San Francisco with fibre, spanning 900 miles of streets. Assuming half aerial construction and half underground, the aerial portion was estimated at US$41.9 million versus the buried costs estimated at US$327 million.

it shares the market with other providers. As of March 30, 2009, RVA, a consultancy, had identified 681 other providers of FTTH in the United States, which represents more than 1.1 million total connections. Verizon projects the total cost of providing FTTH will be US$23 billion over about 20 years.

The deployment of FTTH should be compared with the first two hard-wired networks in the United States: Copper telephone lines, started in 1876, and coaxial-cable T.V. lines started, in 1948. While deploying FTTH will take time, reaching 90 per cent of Americans with FTTH is unlikely to take 90 years, as with copper, or 50 years, as with coaxial cable.

Canada has not yet seriously embraced a fibre strategy, although it was mentioned in discussions on a National Digital Strategy organized by Industry Canada in 2009. The major telecom companies, to avoid heavy new required investment with the attendant increases in pricing, opposed having Ethernet access (essentially high-speed fibre access through a passive optical network) included in the basic package of required access services. The CRTC agreed and ruled that given the presence of other service providers, the majors did not have to provide Ethernet (fibre) access.[28]

That judgment is problematic on a number of fronts. The other providers barely account for five per cent of the market and are largely reliant on the majors for access to new residential developments, which account for most of their market. It may also prove a Pyrrhic victory for the majors, because while they have avoided (for the present) the requirement of major investments, the premium market will demand such services and will seek out providers.

Bell Aliant has become the first major company in Canada to deliver fibre to the home (FTTH) to entire cities.[29] The company is investing $60 million to serve 70,000 homes and businesses in Fredericton and Saint John by mid 2010. The two cities were considered to have the economic characteristics that enable all-fibre architectures to be deployed, such as the prevalence of aerial cable opportunities. Aerial cable has a considerably lower cost of deployment when compared to buried cable. The study noted above found that the cost to use aerial cable to connect half of the homes in San Francisco would be one-eighth the cost of using buried cable for the remaining half of the homes. Aerial-supported cable would cost about US$420 per home, while buried cable would cost about US$3,270 per home.

The Canadian situation is also complicated by the significant investments made by the major players in copper and coaxial cable connections that have yet to pay for themselves. There is an understandable reluctance to invest heavily in a new layer of connectivity for which consumer demand has yet to fully express itself.

28 For the successive rulings see www.crtc.gc.ca/recherche-search/?q=Ethernet+Essential+Service&n=e&d=crtc&m=#
29 Bell Aliant news releases dated July 7, 2009 and September 18, 2009

WHAT POLICY ON NEW FOREIGN INVESTMENT AND COMPETITION COULD MUNICIPALITIES ADOPT?

Municipalities will see increased wireless investment in the short-run, as the incumbent companies upgrade their facilities and Wind/Orascom seeks to establish a foothold. However, these investments will have only a limited impact on municipal infrastructure. They are primarily tower-based, and while some municipal buildings will be involved, the agreements are mostly private agreements between building owners and the companies seeking rooftop access.

On one level, municipalities need not concern themselves with private business arrangements that do not affect the general welfare. While municipalities may wish to see lower, more competitive, prices to encourage the development of Internet-reliant businesses and services, they are more immediately concerned with recouping the costs of the attendant private-sector development. They certainly have a case that, if the incumbents are enjoying near-monopoly rents, the municipalities, as enablers, should at a minimum be compensated for the full range of their costs.

The situation becomes more complicated with the prospect of new, international investors, who will not have as strong a commercial position as traditional companies but will still require the same municipal access and cooperation.

Municipalities likely do not want to involve themselves in the various tiers of telecom investors, but would rather focus on a consistent and equitable regime of cost-recovery. They should welcome new investors, as they have incumbent investors, but continue to treat all market entrants equally on the basis of a fiduciary obligation to municipal tax payers. In that regard, the recent *MTS Allstream v. Vancouver* CRTC decision provides some guidance. However, the effective implementation of the decision remains unrealized, in part because of a lack of awareness and experience by all parties.

The deciding battle will likely concern the extension of Fibre to the Home (FTTH) or Fibre to the Building (FTTB) construction. Optical fibre has advantages in reliability, cost and bandwidth that will likely not be supplanted for some time, even given advances in satellite technology. Twisted copper and coaxial cables, while dominant today, will become obsolete within the next five years, at least in terms of consumer demand for one-to-two-gigabit access.

The advent of FTTH and FTTB will pose a challenge to municipalities. At present, the fibre to the premises (FTTP) market is small. The OECD actually reports that Canada has no (zero per cent) FTTP penetration. Industry reports suggest that the FTTH penetration is actually around five per cent in major urban areas.

That demand will grow in line with both commercial demand and political aspirations. Australia has the most ambitious fibre program,

allocating A$43 billion for a national broadband network to cover the country. France and South Korea have also announced ambitious plans for near total FTTH access. The United States has pledged US$7.2 billion for a mostly rural fibre-access program. In contrast, the Canadian government has announced $225 million, largely for a rural and remote access program relying heavily on satellite coverage.[30]

To the degree that Canada's cities view more robust broadband Internet service as integral to their economic development in such fields as e-commerce, e-health, e-government and e-education, they will no doubt welcome the new infrastructure. However, as their primary responsibility is to the municipal taxpayers and residents, the cities should be fully compensated for the attendant costs, all of which contribute to the profitability of private investors.

Cities are certainly in a position to facilitate infrastructure growth, but not to subsidize it. If subsidies are required, they should be the responsibility of the federal government, which has regulatory control of the industry and whose rulings, primarily by the CRTC, mandate the costs borne by municipalities.

What's on the Horizon?

Canadian cities find themselves in a new situation in which a previously obscure federal regulatory body has assumed effective control over municipal rights-of-way access and accompanying permits as they apply to telecom companies.

On a philosophical level, this represents a tremendous intrusion upon their property rights. The practical reality, however, is that the Federal Court supports the jurisdiction of the CRTC and the Supreme Court has consistently refused to hear municipal challenges. The best outcome is that the resulting arrangements are revenue-neutral and that the municipalities fully recoup all their regulatory, inspection and administrative costs.

As one of Canada's fastest growing cities, the City of Vancouver has been at the forefront of the evolving relationship among the CRTC, telecommunication companies and municipal governments. An illuminating test case has been the City of Vancouver's handling of the Olympic Village complex. In essence, the city contracted out open access for all telecommunication providers. The City ensured that the ducts for cables were large enough to provide space for multiple cables and administered a neutral access policy. That model is now being further refined by private companies, such as A2B Fibre in Vancouver, which negotiates with developers to provide equal duct access to new dwelling complexes. The hoped-for result is private solutions to private interests, which both reduce and compensate for public costs.

The issues are not just about how cities accommodate private companies while upholding the public interest. As municipalities upgrade their own utility infrastructure, they will have to deal with temporarily re-locating telecommunication companies' infrastructure. This was the case in Baie Comeau, Quebec.[31] When the city needed to replace its aging sewer system, it found itself in cost disputes with Bell Canada, whose lines had been laid on top of the municipal access corridors, often without the knowledge of the municipality. As Canadian municipalities start to address their $123-billion infrastructure deficit, situations such as that in Baie Comeau will multiply.

Ronald Coase, the eminent economist and Nobel Laureate, in his seminal article on social cost,[32] outlined the basic structure of contractual agreements to deal with the "externalities" of

30 See Fast Company, "Australia," April 10, 2010 at http://www.fastcompany.com/blog/kit-eaton/technomix/australia-plans-national-fiber-broadband-net-us-debates-stimulus-funds
31 CRTC Telecom Decision 2008-91 at www.crtc.gc.ca
32 Coase, Ronald, "The Problem with Social Cost," Journal of Law and Economics, University of Chicago, (October 1960).

utilities and related infrastructure. There is some irony that Coase's principal example involved the railway companies, which used to pay an annuity to farmers as compensation should sparks from a railway engine ever set their crops on fire. The Canadian *Railway Act* adopted that U.S. precaution, socializing it through the federal government. A new look at the *Telecommunications Act* might similarly adopt and update the liability insights of our predecessors.

CONCLUSION

If foreign investment rules for the telecom industry were liberalized, would substantial new investment flow to Canada?

Although Canada is a mature yet still evolving market for telecom services, as this summary analysis shows, there is scope for new products and services as well as a degree of increased adoption. Even the supporters of the current arrangement concede that Canada's cellular and Internet adoption is at least 20 per cent lower than that of Western Europe.

An initial surge of new foreign investment may concentrate on the cellular market, but the longer term opportunities exist in high-speed (two-gigabit and beyond) Internet services that could support a full range of e-services and e-industries. For that to occur, the most likely candidate as a delivery platform is FTTH and FTTB through Ethernet and Passive Optical Networks.

Satellite services will have a role, depending on costs, but more in rural and remote areas. Unless new ways are found to boost the capacity of existing copper and coaxial connections, they will in time become increasingly obsolete for high-end usage.

From this analysis it appears that changes to foreign ownership rules may address the relative undercapitalization (despite high profit margins) of the domestic telecommunications industry. New capital, new players, new technologies and new liability issues (e.g. who compensates when a fibre is cut and service goes down) have the potential to create a "perfect storm" that could swamp municipalities with significant new costs, unless the existing regime is changed to better protect the public interest.

For municipalities, the bottom line is that they can expect to be confronted with increasing demands for rights-of-way access to accommodate fibre installations. Taking the example of Vancouver, five per cent of dwellings already have fibre access, and the city is challenged to deal with the accompanying inspections, licences and liability issues. Fibre access in the Lower Mainland is growing by around 30,000 to 40,000 new customers a year. That is double the rate of FTTH and FTTB access requests, and the City of Vancouver (and outlying municipalities) will face a major cost driver that will be difficult to factor into its own-source revenues.

Overall, municipalities will face a fluid situation in which none of the major players have a clear idea of where matters are headed or, most importantly, who will pay for the accompanying and still not well understood costs and how. One fact is inescapable: the federal government is driving the regulatory process both in terms of potential new investment and the cost-demands on the cities arising from

rights-of-way and other permits. It has a large policy stake in the successful growth of the telecom industry. That ambition brings with it responsibility.

Cities, which are bearing the brunt of the non-commercial costs, are owed a protocol of fair dealings both by the companies and no less by the federal government. Cities are where capital, technological innovation, consumer demand, commercial strategies and policy aspirations meet. Municipal governments certainly do not want to stop progress, but they have a legitimate expectation that the costs of entrepreneurial and policy successes are shared fairly.

The challenge of providing Canadians with the highest levels of telecommunications access at an affordable price can be met. Municipalities are willing to do their share to stimulate economic growth. Their contribution needs to be recognized by the other players in this fast-evolving field.