



## 0 Executive Summary

### 0.1 STUDY OVERVIEW

► A **qualitative** study of Canadian mobile data services capabilities, focusing on the current shift from voice to data and video services in the wireless industry.

► **Objective.** To build a profile of the mobile services industry and adjacent industries in Canada.

► **Means.**

- Define a value chain for the mobile services industry, including adjacent industries
- Develop an understanding of industry capacity
- Assess the industry's potential to respond to market needs
- Provide a Provincial benchmark

Thus this is not viewed as a definitive or prescriptive study. Rather, the intent is to use the study as a starting point for an ongoing CATA-led structured debate among stakeholders on the continuing development of world leading mobile content and services in Canada.

### 0.2 STUDY APPROACH AND STRUCTURE

**Working Hypothesis.** The degree of convergence between telecommunications and computing has been underestimated. What actually took place rather was an invasion of telecommunications by the computer “ethos”. The traditional telecommunications paradigm (based on evolution and reliability) had to give way to the more innovative computing paradigm (based on disruption and speed, by times at the expense of reliability). This results in two consequences:

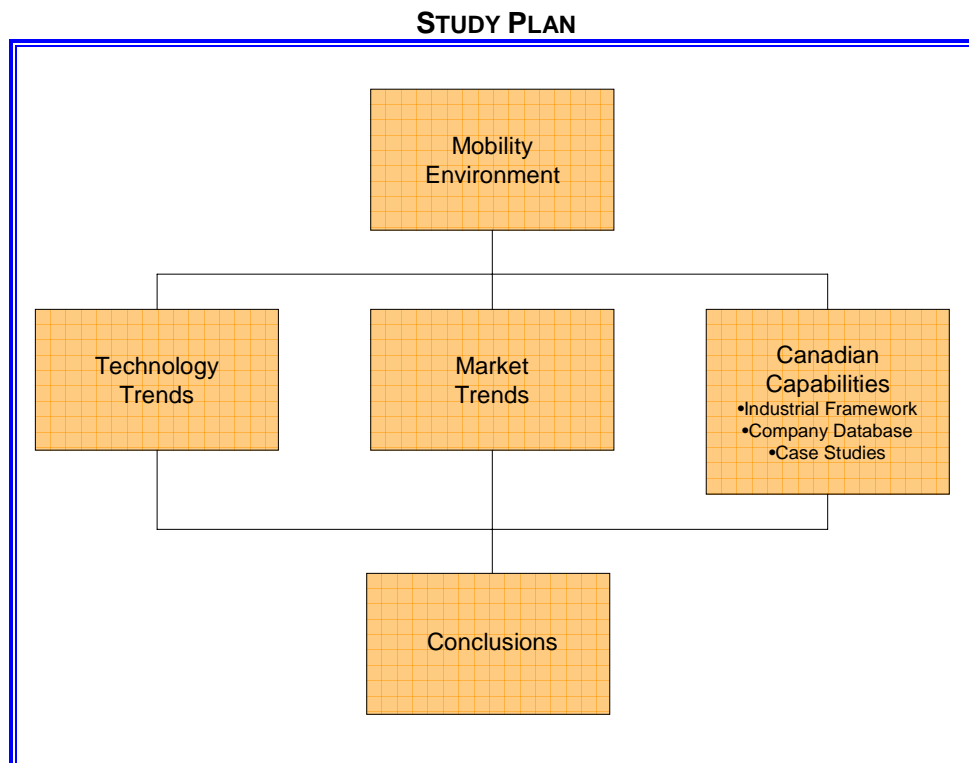
- *Industry consequence:* Telecommunications is becoming a sub-sector of the computing sector that has been renamed ICT sector, which often creates a culture shock.
- *Technology consequence:* Telecommunications is becoming a specialized, largely software-driven, application of computer communications.

The same phenomenon can be observed in other sectors, particularly the content sector which is also rapidly increasing, again largely driven by computer industries. This is resulting in a stratification of ICT services into infrastructure, content and applications. It has several consequences:

- *Infrastructure consequence:* Telecommunications services is becoming a low value-added bandwidth business.
- *Content consequence:* The growth of online content, particularly user-driven content, threatens to upset traditional broadcast business models and regulatory environments.
- *Application consequence:* Explosive growth in business-driven applications is redefining the relationship between the providers and their clients within the ICT sector, particularly telecommunications industries, and is creating many new economic opportunities.

In our study on Mobile Content and Services, this means **it is possible to anticipate the chances of success of a service or of a technology by assessing its degree of computerization** and its relationship with the emerging ICT paradigm.

**Organization.** The overall approach was to build a bottom-up understanding of the mobile services industry:



Key elements of the structure are:

- ▶ A definition of mobile services

- ▶ A discussion of mobile and wireless technology trends, including both cellular and non-cellular technologies
- ▶ A review of market trends, including specific sections on Asia, Europe and North America
- ▶ A discussion of Canadian mobile services capabilities related to the industry value chain.
- ▶ A set of conclusions on the state of mobile services in Canada

Also included as integral parts of the study are a Canadian capabilities database with entries for over 200 companies as well as the results of 23 case studies and interviews.

### 0.3 MOBILITY ENVIRONMENT

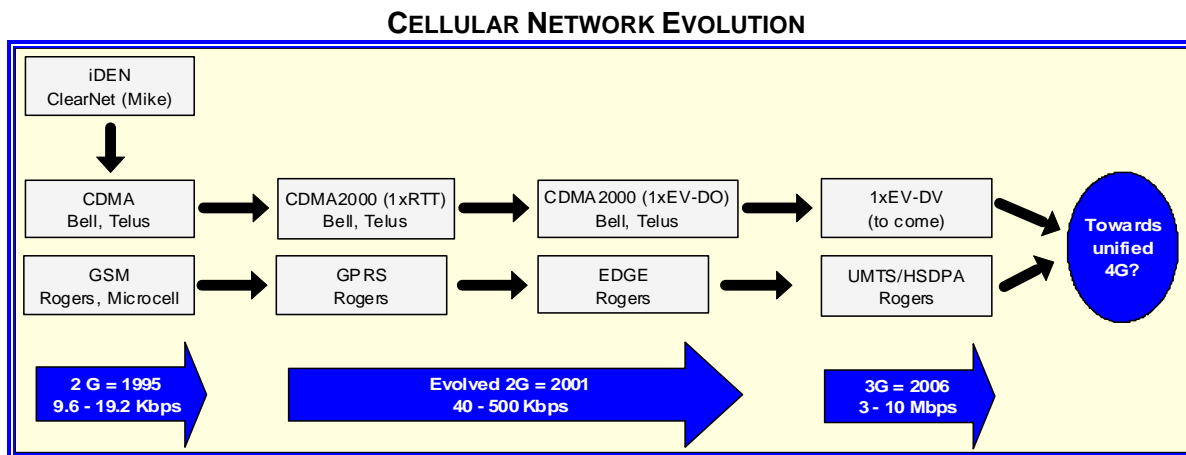
**The study is based on the following definition** of mobile services:

- ▶ Mobile – refers to individuals or things in motion
- ▶ Services – refers to an integrated set of applications, content and infrastructure
- ▶ Mobile Services - connects one, or more, individuals or things in motion via a set of services
- ▶ Mobile services may connect:
  - Mobile individuals to each other
  - Mobile individuals to a central service
  - A central service to mobile individuals, or things
  - A user (not necessarily mobile) to mobile individuals, or things
- ▶ Mobile does not necessarily mean a “wireless connection”. For example an iPod is mobile but not connected to a wireless network.
- ▶ Mobile services apply equally to work and play activities.

### 0.4 TECHNOLOGY TRENDS

Technology trends are characterized by:

- ▶ Continued cellular evolution in terms of the move to Broadband wireless (2G – 3G – and soon 4G)



*Source: ScienceTech Communications*

- ▶ The development and growth of non-cellular technologies such as
  - WiFi
  - WiMAX
  - Bluetooth, ZigBee and UWB
  - RFID
- ▶ The gradual integration of wireless and non-wireless networks
- ▶ The growth of mobile content, particularly user-driven content
- ▶ The development and growth of applications in a number of key areas, including:
  - Text Messaging
  - Entertainment
  - Industrial Wireless
  - Health Care
  - Financial Services

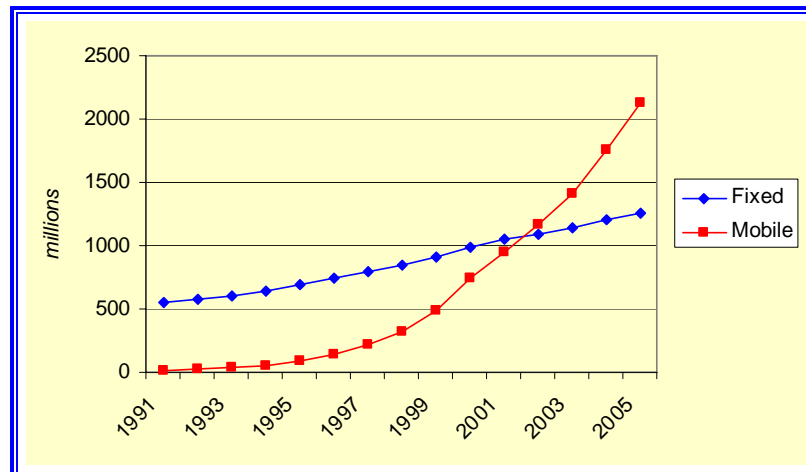
Mobile applications are aimed at enabling business and consumer activities in 3 key areas:

- ▶ Increased Competitiveness (e.g. fleet management, inventory tracking and meter reading)
- ▶ Wealth Creation, particularly in terms of new sources of revenue (e.g. mobile gaming and social networking)
- ▶ Quality of Life Improvements (e.g. patient monitoring and personal security)

## 0.5 MARKET TRENDS

Mobility has become the core of the telecommunications sector: wireless subscribers overtook wireline subscribers in 2001 and continue to grow rapidly, particularly in China, and now India.

### THE CROSSROAD: IN 2001 WIRELESS TAKES OVER WIRELINE



Source : ITU Key Global Indicators for the World Telecommunications Service Sector, 2006

In terms of revenue, the wireless data global market was estimated between \$86 billion and \$100 billion in 2006.<sup>1</sup> The bulk of this market is constituted by messaging (headed by SMS), generating 67% of the total revenue. Interestingly enough, user-generated content, one of the most potentially disruptive applications of mobile services, already generated \$3.5 billion in 2006.<sup>2</sup>

This is a beginning. The amount of traffic is about to surge, and most observers agree with the prediction that within seven years the majority of the mobile traffic will be data oriented (messages, music, video streaming and downloads, and enterprise applications).

<sup>1</sup> Informa Telecoms & Media (\$86 billion) and ABI Research (\$100 billion).

<sup>2</sup> Informa Telecoms & Media: <http://www.informatm.com/itmgcontent/icoms/s/press-releases/20017401985.html>

**Mobile Internet**

*The arrival of the mobile web on the mobile handset over in 2007 and beyond will see users embracing the same content they take for granted on their PCs. Operators need to ensure they are firmly locked into this value chain or risk missing out on what will be an enormous market by 2011.*

Daniel Winterbottom, Senior Analyst  
Informa Telecoms & Media

Market trends are characterized by:

- ▶ Market leaders are Asia, Europe and the US followed by Canada in terms of mobile subscriber penetration and mobile versus wireline density
- ▶ Cellphones account for ~60% of the Canadian mobile device market, followed by MP3 players (~12%)
- ▶ Voice dwarfs all other mobile usage in Canada (wireless data represents 990 million over the \$11 billion cellular market)<sup>3</sup>
- ▶ Within wireless data, messaging dwarfs all other services
- ▶ The US is by far the largest RFID market (Canada is a distant 10<sup>th</sup>)

## 0.6 KEY CONCLUSIONS

### 0.6.1 Mobile Data Services

▶ **2007: Canada's Takeoff.** Mobile data services have reached the 10% mark of Canada's wireless revenues – Rogers passed it last year, the other wireless carriers will pass it in 2007.<sup>4</sup> Once a product passes 10% of net revenues, it is no longer a passing fad and its continued proliferation becomes irreversible. Companies cannot treat such a revenue source as a temporary anomaly and have to embrace it forcefully and fight for it. In 2007, Canadian carriers have reached this threshold.

There appear to be a number of signs to confirm this prediction:

- An agreement between Telus and Amp'd Mobile for the distribution of mobile content to the Canadian market (music, 3D mobile gaming, live sports and concert video streaming, mobile communities, personalization features, etc.)
- Launching in December 2006 by Rogers of the first Canadian high speed wireless network (HSDPA) which will facilitate the development of mobile services
- Launching of Mobile Movies by Bell Canada in February 2007, the country's first service offering full-length, pay-per-view movies on mobile phones. Content deals were secured with Disney and Sony
- Canadians send more than 18 million text messages per day<sup>5</sup>

<sup>3</sup> Revenues for 2005 (CWTA figures). <http://cwta.ca/>

<sup>4</sup> Rogers' revenues from wireless data services grew approximately 54.5% year-over-year to \$459 million in 2006 from \$297 million in 2005, and represented approximately 10.6% of network revenue compared to 8.2% in 2005. Rogers' Annual Report 2006.

<sup>5</sup> CWTA Wireless Facts & Figures: <http://cwta.ca/CWTASite/english/industryfacts.html>

The rapid growth of mobile services does not go without missteps. For instance, in January 2007 Telus started offering pay-per-download adult content to its domestic clients through their cellphones. The financial rationale may have been sound, but the popular opposition was acrimonious and Telus withdrew its service two months later. However, even if unfortunate, the incident underlines the growing interest in mobile content.

Similarly, there is a growing number of blogs criticizing the carriers for their speed and approach to providing mobile content and services. Clearly there is a strong demand and the market is impatient to see the faster introduction of affordable services that meet their needs.

The technology is clearly available, the content and services are rapidly being developed and the market is ready. The question is whether the services will be sufficiently affordable to realize their growth potential and help move Canada into a leadership position.

### 0.6.2 Infrastructure

- ▶ **Canada's Paradox.** Canadian wireless infrastructure is characterized by a paradox: On the one hand, it is growing rapidly and appears to be highly competitive yet it is not among the world champions. This is a departure from Canada's traditional leadership in wireline infrastructure where Canada has always been the first or among the first three countries in the world. Factors contributing in varying degrees to this situation include:
  - Canadian cellular penetration rate is lagging Japan and Korea, the US and Western European countries (even though European countries have an artificially high penetration rate due to interchangeable SIM cards – actually a sign that common standards and unlocked phones have helped foster competition).
  - Canada has a relatively high level of average monthly minutes of use (MOU) compared to most other countries – though it lags behind the US by a wide margin (1 to 2).
  - Rate structures that are contradictory to competitiveness and growth (e.g. higher cost wireless per minute pricing versus inexpensive flat rate landline local calling, few prepaid subscriptions, long term contracts with punitive penalties, and locked SIM cards in the case of Rogers).
  - In addition to cost concerns, complex billing for voice and especially data is an issue (as many who have tried to surf the Internet with a Canadian cellular subscription have attested).
  - A continuing focus on voice as others move more aggressively into data services (e.g. Canadian wireless operators continued too long to focus on average voice users and were late in developing mobile contents).
  - The implications of a vast and sparsely populated geography on continued infrastructure re-investment required by technological development (carriers

have so far invested ~\$20 billion on 3 national networks and have struggled to become profitable).<sup>6</sup>

- Leapfrogging by other countries without a fixed telecommunications infrastructure investment to protect (particularly in Asia where wireless growth is occurring at a phenomenal rate).
- A multiplicity of transmission standards that diffuse rather than leverage Canadian wireless strengths.
- A low rate of innovation by the carriers (investment in R&D is at the same level as the beverage industry, lower than the automotive industry).
- Lack of a pure foreign wireless player without investments in existing fixed infrastructure and, even more important, with a competitive culture (typically a catalyst for increased competition in other countries). Even Rogers, which has almost no landline legacy to protect and arguably innovating more than its competitors, does not compare to a company such as Vodafone for instance.
- Occupation of large chunks of spectrum that are left unused or under-used and prevent competitors from entering the market (the clearest example being Inukshuk, a joint-venture Bell/Rogers, that has the potential to bring high speed outside the big cities).
- A less developed mobile culture (particularly compared to countries such as Japan and Korea).

▶ **The disruptive effect of infrastructure convergence.** As the wireline and wireless infrastructures converge through the development and deployment of such technologies as WiFi and WiMAX, the distinction between the two previously separate services is blurring. This has the potential to disrupt existing business models, particularly wireless.

▶ **The coming collision of device technologies.** Much of Canada's strength lies in the use of keyboard based devices, common in North America, while the rest of the world is more comfortable with telephone keypads. The convergence of devices, particularly cell-phones and PDAs, as well as the emergence of new wireless device interface technologies is likely to disrupt existing business models and open up existing markets to a wider range of competitors.

### 0.6.3 Content

- ▶ **Content is a driving force.** It has the potential to increase use of mobile bandwidth much more substantively than simple messaging applications and change the business model from usage pricing to access pricing (predefined bandwidth with unlimited usage, maybe with a volume ceiling). User created content (the YouTube phenomenon) is moving apace while business driven content is evolving more slowly.
- ▶ **Obstacles faced by Content Owners.** Existing large content owners (media, film producers, game developers) are at the early stages of exploring mobile content delivery for a variety of possible reasons, including:

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<sup>6</sup> Indeed, we should write 2.5 national networks, since only Rogers has a true national infrastructure. Bell and Telus concluded a roaming agreement in October 2001 that allows Bell to access the Telus wireless network across rural Alberta and BC. Similarly, Telus gains access to the Bell network in Ontario and Québec, extending Telus' rural coverage in Ontario and Quebec. As a result of this agreement, Bell and Telus are said to have avoided capital expenditures of more than \$500 million (over the term of the 10-year agreement).

Lack of market clarity for content on small screen mobile devices  
 Lack of established revenue sharing formulae with carriers  
 Concerns about Intellectual Property issues and potential regulations

- ▶ **The emergence and growth of IPTV.** At this time IPTV is still in its early stages and threatens to redefine the world of broadcast content. Its potential impact on mobile content is not yet clear and will probably be a function of such factors as:
  - user demand for TV content on small screen devices
  - bandwidth & pricing for broadband content
  - demand for connected mobility versus unconnected mobility (e.g. iPod).

#### 0.6.4 Applications

- ▶ **Messaging.** With about 85% of the wireless data market, messaging is currently the killer application. This is an application with broad applicability, from mobile marketing to social networking to mobile payments. It generates high traffic volumes but has relatively low bandwidth consumption. It is already heading towards maturity and is characterized by three competing technology approaches, including SMS (the prevailing application), Instant Messaging (IM) and standard email. Messaging uses both keypads and keyboards.
- ▶ **Entertainment.** While Canada has some substantial strengths, particularly in the gaming area, the question is whether Canada can compete globally in this market. It is a fast moving global market, but a weak domestic market with global differences and barriers for Canadian companies. In terms of mobile TV, the market is in its early stages (11 broadcasters are currently making some content available on mobile platforms), but the US is starting to make a substantial move.
- ▶ **Industrial wireless.** Canada has existing wireless strengths in such areas as transportation, inventory tracking, fleet management, and service management. These location-based applications typically integrate wireless devices with global positioning systems, and increasingly incorporate RFID technology and sensor networks.

These strengths are equally applicable to other areas of Canadian industrial strength, particularly the Natural Resources sector (e.g. in mining, oil & gas, and forestry), as well as the Environment. At this time, there is limited evidence of mobile application development resulting in company formation, although some large Natural Resource companies have been using the technology internally for some time (e.g. mining companies).

Most of the companies engaged in this area are small and the challenge is to develop the larger companies required for sustained leadership in this area.

- ▶ **Medical wireless.** This is also an area of Canadian strength involving both ICT and Life Sciences companies. Of particular note is the development of patient tracking services involving the same underlying location-based technologies as the industrial wireless area.
- ▶ **mCommerce.** Again this is an area in which Canada appears to be falling behind. The carriers are focusing on developing a common domestic wireless payments infrastructure while the Financial Services sector appears to be pursuing its own individual approaches. Meanwhile, the US is taking the lead in the international arena:

- PayPal, now owned by eBay legitimized the market, with 133 million active accounts. The company recently announced a major deal with the world's largest mobile carrier Vodafone to offer mCommerce services in Europe.
- VISA also announced in November 2006 that it is moving into the market in a substantive way. It started a mobile payment trial with approximately 500 Visa employees in California that would last during 2007. Pilot participants received payment coupons and rewards that can be redeemed at on-site cafes located at Visa's corporate campus.

## 0.7 KEY ISSUES AND OPPORTUNITIES

### 0.7.1 Issues

There are a number of key issues facing the development of mobile services, some of which are endemic to the ICT sector as a whole. These include:

- ▶ **Lack of market clarity.** In the absence of available infrastructure required to support content-rich mobile services, it is difficult to gauge demand for multimedia services. As with any emerging technology, much of the demand is likely to be “latent” demand that will only become evident once the services are available. Non-connected content delivery in North America (e.g. iPod), and connected services successes in other jurisdictions (particularly Japan and Korea), suggest two main models:
  - Users are ready to pay for content that they can relate to personally (music, games, video clips).
  - Users are very reluctant to pay for undifferentiated generic content (news, weather, traffic) and hence there is a dependence on advertising revenues by companies addressing this type of content.
- ▶ **Tariff structures out-of-synch with market realities.** A key advantage of fixed telecommunications in Canada has been the flat rate pricing for local calling. The per-minute pricing for mobile calls, as well as paying for incoming calls and the overall complexity of the tariff structure, especially for mobile data (mobile Internet), has been an inhibiting factor in the adoption of mobile services. As mobile has overtaken fixed communications and other countries have adopted flat rate mobile pricing especially for mobile data, tariff structures have become a liability to Canada and the situation is likely to get worse with the move to broadband mobile services.
- ▶ **Content owners are in an uneasy position.** Content owners are faced with difficult issues related to developing business models for mobile content. This is due to a number of factors, including:
  - The lack of market clarity issues addressed above;
  - Persistent “walled garden” attitude of carriers;
  - Lack of a clearly defined revenue sharing formulae with carriers (Japanese carriers take a well published transparent 9% mark-up on the sale of mobile services by third parties while Canadian carriers negotiate mark-ups that are often in the 50% range);
  - Delay of carriers to embrace mobile content compared to other jurisdictions such as Japan, Korea and northern Europe;

- Intellectual Property issues on digital media (including mobile) that were at the root of the first Canadian artists' strike ever<sup>7</sup> and the persisting hostility of the major players of the music and cinema industries; and
  - Uncertainty regarding potential content regulations relating to the protection of Canadian culture, not an immediate issue, but one that will become more sensitive as Internet media delivery in general, and mobile content delivery in particular, proliferates.
- ▶ **Application developers are fighting to survive.** Most of the mobile application developers are small companies struggling to get their products to market. They are generally starved for cash by an investment community that does not understand content-based services and mobile applications and have to rely on relationships with carriers, government agencies and content owners in order to get their products to market. Given the newness and uncertainties surrounding mobile services, developing these relationships takes a considerable amount of time and effort. Increasingly, start-up companies are focusing on developing their products to the point where they can profitably sell-out to foreign multinationals, mainly in the US.
- ▶ **The Canadian Master Asset: Manufacturers.** The void left by the limited amount of R&D performed by the carriers has been filled by the three major mobile infrastructure and handset manufacturers Research In Motion (RIM), and Ericsson Canada. Not only have they been innovating in their core business (manufacturing) but they are establishing interesting links with mobile applications developers:
- For the last five years, RIM focused its Independent Software Vendor (ISV) partnership efforts around supporting development of mobile applications that serve key industries: financial services and insurance, legal, health care, real estate, government, and law enforcement. In addition to 1,500 business applications, the BlackBerry supports thousands of consumer applications, including mapping and photo sharing.
  - Ericsson Canada launched in May 2006 a Mobility World Expert Center in its Montreal laboratory. This Expert Center aims to accelerate the creation of innovative multimedia applications and services by content and applications providers, as well as operators. The Montreal Expert Center has a dual mission: local and international. Hence developers can leverage on the Ericsson Mobility World network that is present in 35 countries.

### 0.7.2 What can be done?

It is clear that Canada is at a crossroads in terms of telecommunications and the recent mobile services takeoff has to be nurtured with care. It is an area of great opportunity for Canada and this report identifies many emerging suppliers of advanced mobile content and applications.

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<sup>7</sup> The Alliance of Canadian Cinema, Television and Radio Artists (ACTRA) went on strike from January 7 to February 17, 2007.

Developing the opportunity is not something that can be adequately addressed by governments (both federal and provincial), business, or associations individually but will require the concerted attention of all of them to help foster a vibrant mobile content and services industry. In terms of mobile services, areas where government and industry can provide a positive impact include:

- ▶ By Industry (particularly by the carriers and major content owners)
  - Accelerate and champion the deployment of the mobile services environment and available content
  - Move towards a more open network, including encouraging infrastructure convergence in areas of fixed and mobile infrastructure, and cross-carrier interoperability
  - Recognize that broadband content will drive revenues and adopt tariff structures that are both competitive and simple
  - Provide innovation support for smaller mobile services companies
  - Set a revenue sharing formula that promotes the creation of mobile content and services
  - Recognize the importance of the consumer in driving mobile content and embrace user generated content
  
- ▶ By Governments (including provinces)
  - Develop a national wireless strategy focused on mobile services (and encourage provincial governments to do the same in their own jurisdiction areas)
  - Foster development of wireless (and mobile services) champions
  - Provide mCommerce leadership through the mobile delivery of government services
  - Encourage mobile application development across the economy (spurring the creation of mobile industrial clusters and cross-cluster fertilization)
  - Encourage carriers to do R&D (e.g. through financial incentives such as tax credits and if necessary by using the spectrum allocation process)
  - Encourage full convergence of fixed and wireless infrastructure across Canada (if necessary by using the spectrum allocation process in order to foster and support this convergence)
  - Address issues related to intellectual property and revenue sharing for mobile content (if necessary by using the spectrum allocation process to promote aggressive solutions)
  
- ▶ By Associations
  - Increase staff with intimate knowledge of the industry, clients and development, particularly regarding mobile content and services, and who are valued for this knowledge.
  - Encourage the creation of specific wireless associations such as Ottawa or Calgary hubs.

- Increase short-term support for wireless companies, including business development in general, bringing multinationals to meet local companies, and help with the first sale.
- Increase long-term support by understanding company needs, taking a cluster perspective and helping put supporting infrastructure, services, and education in place.