

Taking Ontario Mobile

Research-based recommendations for how mobile technologies are part of the financially responsible solution to providing better access to services for Ontarians



Ontario



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Letter from President Dr. Sara Diamond: Why Take Ontario Mobile?

The *Taking Ontario Mobile* report was prompted by a transformation that is occurring at a global scale—the exponential adoption of mobile technologies, networks and content—and by the need to understand the potential opportunities and challenges this change may bring to Ontario. OCAD University initiated this project because of our belief that mobility is a burning platform that Ontario can, should and must build on. The recent *2020 Media Futures*¹ report found that in a world where mobile penetration is at approximately 74 per cent according to the Global System for Mobile Communications Association (GSMA), there are no evident counter-trends that could stall or reverse the movement toward portability and mobility. More than half of the world’s population owns a mobile telephone, and there are 5.9 billion mobile subscribers worldwide.

Taking Ontario Mobile is unprecedented in its scope—addressing needs, potentials and capabilities. Our methodology is unique: we have engaged with strategic foresight and scenario development, undertaken surveys and interviews, and carried out extensive secondary research—we combine quantitative and qualitative methods. Our research team includes private-sector experts and academics, and we have consulted closely with ministries across the Ontario public sector. The report builds on the work of the Mobile Experience Innovation Centre (MEIC) that OCADU initiated in 2007, which is now a multi-sector non-profit. MEIC was created in response to the concern that Canada, despite the strength of companies such as Research In Motion and the history of wireless engineering with Nortel, was falling far behind other jurisdictions in its overall adoption of mobility and invention of mobile content, services and experiences. *Taking Ontario Mobile* allows us an opportunity to assess where Ontario stands as a province in 2012.

We define “mobility” as the capacity to move seamlessly through work, leisure and personal life wherever one is located because of four fundamental characteristics of mobile technology: 1) 24/7 ubiquitous connectivity; 2) intense personalization, which allows information to be delivered based on individual needs and preferences; 3) heightened access to social networks and media; and 4) context and location specificity, which combines the features of the Internet with the ability to take location into account. Mobility redefines the individual as part of a network that links data, technologies, content, context and other users and systems to create a profoundly new way of being in the world. OCAD University’s interest in mobility is reinforced by the crucial role that design plays in creating processes, systems and products in the mobile sector. Successes in the mobile industry are the results of battles for excellent design—design that understands and responds to its users. Apple has dominated markets because of its capacity to trumpet design excellence and to continually invent new delivery systems that respond to users’ needs, such as iTunes. Joseph Crump, the executive creative director

¹ Greg VanAlstyne, “2020 Media Futures,” in *2020 Media Futures*, ed. Greg VanAlstyne (Toronto: OCADU, 2011).

of Razorfish/Microsoft, described the iPhone victory thus: “Usability—once fetishized—is now merely the price of entry. . . . The bar is getting raised every day for the way an object or an experience looks or feels; its tone of voice, its personality.”² The failure to place design first and foremost can be seen as the Achilles heel of other companies in the mobile space. In the creation and deployment of tools and systems, it is important to build technology interfaces that offer extreme ease of use as well as personalization.

As generations around the world grow up “untethered”³ and as more adults join mobile culture, the conditions of intimacy, connectivity and individuation are transformed: the device becomes an interface for private and public services. Yet mobility can be invasive. The constant interruption of mobile communications is now an accepted part of social and business activity, and the voices of personal mobile dialogue (despite the dominance of text messaging and email) remain part of our environment. Mobile marketing and advertising now interrupt the flow of mobile communication. At the same time, mobility is solitary. We are familiar with the sight of individuals looking down at their mobile devices (“praying”) while they thumb anxiously through their email, with social context fading into the background—what Sherry Turkle calls being “alone together.”⁴ This is a disconnected connectedness characterized by multitasking, or the ability to “keep in touch with a lot of people who we also keep at bay.”⁵ Attitudes toward risk are also shifting with secure-payment systems, online ad tracking, social networks, more exposed personal data, location-based services and information disclosure. These transformations require us to address policy issues such as privacy and consumer protection.⁶

Yet new mobile devices afford new possibilities. Tablets, for example, add additional capacity for collaboration through increased screen size, while context- and location-based applications allow the melding of the virtual and physical worlds in learning applications and entertainment that gather groups of players and learners. Social media is a growth market that facilitates collaborative work, engagement for isolated individuals and support for preventative health measures. When well designed, mobile devices and mobility can act as gateways and creative centres.

I am optimistic about Ontario’s ability to succeed in meeting the mobile challenge. As you will read in the report, cost has often been described as an inhibiting factor in Canada. As the winners of multiple spectrum auctions come on stream, pricing is expected to drop as coverage extends throughout the

² Joseph Crump, “the new! improved! black box: Four questions that should keep creative people up at night,” *2008 Digital Outlook Report* (2008).

³ Sherry Turkle, *Alone Together: Why We Expect More from Technology and More from Each Other* (New York: Basic Books, Perseus Books Group, 2011).

⁴ *Ibid.*, 14.

⁵ *Ibid.*, 14.

⁶ Services such as Foursquare, Facebook Places and Gowalla provide exact data about where users are located, as well as information about their social contexts and activities.

province. One might predict that a more open environment will have a stimulating effect on mobile development. In addition, the adoption of mobility as a requirement for doing business in many sectors continues to expand the base of those engaged in mobility. The global take-up of mobility and the expansion of the smartphone market represent a growth business for the many Ontario companies developing applications for mobile devices, including productivity applications, utility applications, data services, games and applications that accompany or complement existing media and information franchises. To take advantage of our capacity, we need to build local markets that can retain and strengthen companies; we also need to ensure that our own residents benefit from the innovation produced in Ontario yet currently primarily sold abroad, such as m-health and m-education applications.

Ontario is a province with significant mobility resources in our human capital, knowledge economy resources, industrial bench strength, social infrastructure and global networks. These strengths have direct bearing on the matter of this report, which explores how to engage mobility in order to better realize the full potential of all of Ontario's residents, bring significant increases in productivity, create and retain jobs in the knowledge industries, allow inclusion and engagement, and build on Ontario's extant leadership in the broad cast of mobile industries.

Even in times of economic duress, the failure to modernize by changing technology and systems, building infrastructure and developing capabilities in research, education and industrial impact could lead to significant future gaps in competitiveness. The international shift toward the adoption of mobile lifestyles and policy initiatives warrants our attention.⁷ After all, we face a global economic challenge and a world in which mobility sits at the crossroads of business capacity. We believe success is only possible through the collaborative efforts of industry, government and public sectors such as health-care, education and post-secondary education (PSE). In imagining an action plan, we understand that government must seek new sources of revenue and constrain expenditures. Ontario will need to balance its plans to curtail its use of traditional instruments such as tax incentives against the need to intensify public/private industry collaboration and retain and attract industry in order to ensure an enhanced tax base and job creation in strategic sectors.

Ontario has a unique window in which it can position itself as a centre of excellence for mobility. There is a legacy of leading technological development, a collaborative spirit between the private sector, government, public institutions and academia, and a diverse user base that possesses the attributes necessary to be a successful "mobile" market. We are an ideal test bed for applications: Ontario includes one of the largest metropolitan areas in North America, the seat of the Government of Canada, and remote, rural and Aboriginal communities. The quality of life and economic well-being of Ontario residents can be radically transformed over the next decade with the possibilities that mobile technologies, networks and applications offer.

⁷ See Taking Ontario Mobile Appendix: Jurisdiction Analysis and International Policy Environment: Consumer Protection Policies for Cell Phone and Internet Use



Executive Summary

Taking Ontario Mobile examines the benefits of mobile technologies for Ontarians as they work, learn, play, shop, seek care and interact with others. The report considers the disruptive nature of technologies and provides guidance and support for implementing mobile solutions, in order to enhance services for Ontarians as well as to improve their access to them. We have extrapolated from the province's capacity and potential and the desires of Ontarians we surveyed to create a comprehensive vision for a mobile Ontario. Our recommendations suggest the possibilities of enhanced access to services, heightened productivity, increased social inclusion and the creation of jobs. We address current challenges and propose an action plan, accompanied by a road map that provides three-month, six-month, one-year, three-year and five-year deliverables against which to benchmark. Given the potential for mobility to provide low-cost services across many government ministries, a mobility plan for Ontario needs to include the vast majority of the province's residents. At the same time, Ontario cannot wait for 100 per cent coverage or ubiquitous broadband before beginning to move toward mobile capacity.

The Taking Ontario Mobile report provides the following tools:

- A discussion of five sectors that intersect with multiple aspects of Ontarians' lives: Lifelong Learning (pg. 4), Health (pg. 28) and Government Services (pg. 46) are essential to the quality of life and productivity of the province's citizens. We also investigate mobile Entertainment (pg. 84) in recognition of the strength of cultural industries in Ontario, and look at the potential and challenges of adopting mobile Commerce (pg. 66), given the importance of Ontario's financial industries.
- An analysis of challenges and recommendations for these sectors;
- A discussion of the difference mobility would make in the lives of Ontario residents by providing increased productivity, jobs, inclusion and engagement.
- An examination of which of Ontario's private, public and post-secondary sectors have the capacity to act.
- An outline of the forms that mobile inclusion—economic and social—may take and an understanding of the barriers to mobile inclusion (pg. 112). The principle of inclusion articulates the mobile resident as a democratic citizen as well as a consumer, and the sector strategies that we propose can be approached within an inclusive design framework. We also address accessibility, suggesting that technical solutions be flexible in their functional specifications. Content and interface design are presented in a way that enables personalization, and designs are not produced for an ideal user or a fixed set of abilities or disabilities.
- An analysis of Ontario's mobile industry and its support systems based on a jurisdiction review that examines the capacity of our mobile sector (pg. 128). We look at the regulation, services and use characteristics of other jurisdictions selected because they possess comparable demographics or are rapidly growing or inspirational mobile markets. This review results in a set of recommendations for building industry capacity.
- An analysis of resident and sector surveys regarding mobile use, attitudes, perceived needs and future plans based on our primary research, providing a context for action (pg. 162).
- A note on the threats posed if Ontario does not adopt a clear mobile action plan (pg. 186).
- An action plan with recommendations presented as 10 themes that emerged from our analysis of

sector activity, survey data, interviews and discussions with experts (pg 190).

- A road map that offers immediate and long-term actions, including “quick wins.” (pg. 218)
- A series of 10 scenarios that describe how residents from across Ontario will be affected by the growth of mobile services (pg. 236). These scenarios show the impact of mobile on varied demographics, be these families, private- and public-sector workers, students, the elderly or the disabled. We have developed the scenarios and mapped them against the respective areas of Ontario—including urban, regional, rural and remote communities—in order to show the breadth of effect.
- A set of appendices that describe the research team and provide background research, extended information and other resources (pg. 268).

Ontario’s Current Challenges

We table Taking Ontario Mobile during a time when Ontario faces grand challenges: a significant deficit of \$16 billion and a projected slow recovery, at about two per cent per year; only 2.7 per cent growth; six per cent annual inflation in healthcare and post-secondary education (PSE); and a 7.7 per cent unemployment rate. ⁸ Government is focused on developing a strategy to reduce the deficit in a balanced, strategic way that sustains or even improves quality and will allow Ontario to excel in the future; for these reasons, government has designated education, PSE and health as sectors that must be protected. However, to meet government’s deficit-reduction targets, enhanced productivity will be of fundamental importance—not only in these two domains, but across the public sector. ⁹

Arguments throughout this document indicate ways that mobility can help to address the quality and productivity challenges that Ontario faces. The following are just some examples developed through the pages of this report:

Productivity

- Public services can be delivered in a more cost-effective and efficient manner, combined with efficient just-in-time service delivery. Sectors such as healthcare and PSE can find efficiencies through mobile applications.

⁸ Commission on the Reform of Ontario’s Public Services, “Public Services for Ontarians: A Path to Sustainability and Excellence,” ed. Don Drummond (Ontario: Ontario, Ministry of Finance, 2012).

⁹ The *Public Service for Ontarians: A Path to Sustainability and Excellence* report commissioned by the Dalton McGuinty government stresses that the “bottom line should be delivering effective services to citizens, not preserving the institutional status quo.” Ibid.

Education

- The use of mobile devices and experiences can lead to increased flexibility and engagement in learning, and encourage high school completion.
- Mobile delivery outside of the bricks-and-mortar campus can lead to efficiencies in the use of capital resources in the PSE sector.
- Location-based and context-aware educational opportunities developed with Aboriginal organizations can engage and retain learners in their own communities and ensure that they develop the skills needed for employment.

Healthcare

- Mobility can help to provide home services for the growing population of seniors through effective monitoring and mobile healthcare support.
- Mobility can be an important lever to enable the movement of medical support from acute care to chronic care, home care and prevention.

Labour-Force Demand

- M-learning is a core tool to ensure that the Ontario workforce remains competitive, as it helps workers continually adapt to change, provides a valuable tool for reskilling and just-in-time learning, and allows employees to adjust to changing labour-force demands.

Job Creation and Retention

- The mobile industries are part of a strong economic sector that will continue to expand as mobility becomes even more ubiquitous.
- M-commerce and other extended infrastructure will lead to new kinds of jobs in the knowledge economy across many industries. M-commerce can complement Ontario's strong financial industries.
- Ontario needs to diversify the market for its goods and services. The mobile industry has global relevance: some players have global reach, and others are capable of competing in the global marketplace. Demand in China, India and Brazil for mobile technologies, applications and content is strong.
- As Ontario builds mining and industry capacity in the North, mobile infrastructure will ensure the integration of communities and the effective delivery of services and up-to-the-minute production techniques and efficiency.
- Ontario and Canada are world leaders in medical research—mobile applications of these discoveries could provide us with significant new industries.

Understanding Ontarians—A User-centric Approach

As part of Taking Ontario Mobile, we undertook the following research to assist us in developing an understanding of what Ontario residents want from mobility:

- An online survey of Ontario residents, conducted in order to gauge interest in and ability to access mobile technologies and services.
- An online survey of employees in industrial and non-profit sectors, conducted in order to understand how mobile technology is being used by the labour force in a variety of industries.
- A survey of Ontario industries, conducted in order to understand their current and planned use of mobile technologies.
- Interviews with leaders in the mobile sector, potential users of mobility and key policymakers.
- Interviews with Aboriginal and rural Ontarians, undertaken by Copernicus Research and sLab in order to determine these individuals' mobile needs and strategies.
- A jurisdiction comparison, undertaken by the Toronto Regional Research Alliance (TRRA) in order to understand the relative development of and potential for mobile services in Ontario.¹⁰
- Surveys and secondary research, undertaken by the Mobile Experience Innovation Centre as part of its 2012 research into the Ontario/GTA mobile content, services and applications industry. This Mobile Innovation Survey Report, for the Ontario Media Development Corporation, is excerpted in this report and also available in full as a companion to this report.¹¹

Sector Analysis

The sector analysis focuses on five sectors that exemplify a range of services and content for Ontario residents: 1) lifelong learning; 2) health; 3) government; 4) commerce; and 5) entertainment. Each analysis considers how the sector fits into the worlds of mobile Ontarians as well as how mobility serves goals of increased productivity, job retention and improved services within that sector. Each analysis also considers challenges and develops an action plan to take in order to move the sector toward mobility. We organize each strategic theme into three key actors: government, industry and academia.

¹¹ MEIC, "Mobile Innovation: Mobile Content, Services, and Applications Industry 2012," ed. Kathleen Webb (Toronto: Mobile Experience Innovation Centre, 2012).

We follow our five-sector analysis with a discussion of mobile inclusion that is relevant to all sectors.

Learning in a Mobile Ontario

DEFINITION

While mobile learning (m-learning) is correctly perceived as part of overall electronic learning (e-learning) implementation, mobile enables unique opportunities for learners to engage with others and their environment in novel ways by enhancing their interaction with subject material, providing new skills and appearing to influence completion of both specific learning outcomes and graduation.¹² Mobile learning brings unique affordances to learners, including mobility, ubiquity, accessibility, context sensitivity and personalization.

OPPORTUNITY

Learning in a mobile Ontario:

- Affords quality.
- Affords efficiencies.
- Integrates new groups of learners.
- Improves student retention.
- Supports experiential learning, mentorship and year-round and self-paced learning.
- Facilitates student credit transfer.
- Is well suited to workplace-skills development.
- Provides opportunities for the e-learning and educational publishing industries.

The unique affordances of mobile devices—mobility, ubiquity, connectivity, interconnectivity and context sensitivity—empower mobile individuals, whether they are engaged in K-12 education, post-secondary education or lifelong learning. It is these qualities that propel m-learning beyond standard computer-mediated learning.

K-12

Ontario already has in place an e-learning mandate that is working toward a connected Ontario for every student with a variety of portals and tutoring, mostly for students at intermediate levels. However, school boards will need to set up loan programs to provide mobile devices for those students who cannot bring their own to school, and will also need to provide ubiquitous Wi-Fi throughout the schools in their jurisdictions. Support that allows student learners and teachers to fully integrate mobility into

¹² A secondary school principal at our round-table discussion indicated that preliminary data from his school's m-learning program indicates that students are more engaged. It is expected that this engagement will translate into higher graduation rates as the school's m-learning program matures.

curriculum will be needed, as will the teaching of “netiquette”—the appropriate use of online technology in a learning environment.

PSE

Universities and colleges have increasingly placed a greater emphasis on the quality of learning and the adoption of strategies that encourage student engagement. Almost all analysts and institutions agree that system change must drive toward more flexibility, a focus on distributed learning and increased mobility. E-learning and m-learning will be fundamental means to:

- Allow students to move between institutions with learning resources in the cloud and on their devices.
- Help students pace their educations more effectively and condense their time to completion.
- Enable experiential learning through enriched work placement and service-learning experiences supervised by mentors or faculty in a remote location.

As learning becomes less formalized and accreditation becomes available from outside traditional catchment areas, post-secondary institutions should look to mobile technologies as a means to extend catchment area and to become more inclusive as well as accessible. Through m-learning-management systems and e-services, Ontario students can acquire a post-secondary education while maintaining the economic benefits of living with parents or in affordable locations, and, in the same way, students from other provinces or countries may find and Ontario-based education becomes more feasible.

While enrollment in PSEs is expected to increase in the next 10 years, enrollment is expected to return to 2003–06 levels by 2024.¹³ M-learning enables post-secondary institutions to respond to fluctuations in enrollment without exerting pressure on capital resources or requiring investments in physical infrastructure that will be underused when enrollment levels decrease.

RESKILLING AND LIFELONG LEARNING

We live in a mobile society experiencing increasing globalization. Global sourcing and global labour mean that employees can train anywhere in the world.¹⁴ In many jobs, the workforce is also mobile and not fixed to a specific place, or workers increasingly work from home or from “third-party spaces”—not the office. Young people, sometimes called the “always on” generation, expect that mobile communications will also be part of their work lives. There are thus many business drivers that will propel m-learning forward at the corporate and large-organization level. The widespread deployment

¹³ Rick Miner, “People without jobs, jobs without people. Ontario’s Labour Market Future,” (Toronto: Miner Management Consultants, 2010).

¹⁴ Adapted from Gary Woodill, *The Mobile Learning Edge* (New York: McGraw-Hill, 2010).

of mobile computing means that an infrastructure for m-learning is already in place. Some of the specific benefits of mobile lifelong learning are as follows:

- Mobility provides speedier just-in-time training that responds to an environment of hyper-competition in which companies are often constrained to do more with fewer people. Mobile devices enable workers to train during commuting time.
- In many larger organizations, there is a demand for greater access to and integration of information, data management and communications, all delivered in real time and in context, whenever possible.
- Mobility provides an excellent means through which to offer courses to update compliance with government regulations or industry standards.
- Mobile communications, including m-learning, are in great demand in specific industries, including healthcare, natural-resources monitoring, agriculture, emergency services, government inspections, retail and transportation.

For these reasons, managers in large organizations are aware that m-learning is on the rise, and are at the stage of formulating their own mobile learning strategies.

Health in a Mobile Ontario

DEFINITION

Mobile health (m-health) refers to the use of mobile information and communications technology (ICT)—most commonly, mobile communication devices, such as mobile phones and personal digital assistants (PDAs)—across wired and wireless networks to provide health services and information to medical and public-health workers, as well as to patients and healthy residents of Ontario. M-health further refers to wireless devices such as glucometers, cardiograms and blood-pressure cuffs, which transmit information wirelessly. M-health takes advantage of the 24/7 connectivity, intensive personalization, communication and social media qualities, and context and location awareness of mobility. The ubiquity of mobile devices in both the developed and developing world presents the opportunity to improve health outcomes by delivering innovative medical and health services to the farthest reaches of the globe using ICT.¹⁵

¹⁵ mHealth Alliance, “Mobilizing Innovation for Global Health: Frequently Asked Questions,” mHealth Alliance, <http://www.mhealthalliance.org/about/frequently-asked-questions>.

OPPORTUNITY**Health in a mobile Ontario:**

- Is patient-centric, providing new opportunities for the self-management of health.
- Provides enhanced access, productivity, inclusion and job creation.
- Affects all areas of care, including preventative care, chronic care, remote care, acute care and community care.
- Makes medical care and information convenient and accessible for physicians and/or patients, thus allowing clinical management decisions to be made more quickly.
- Keeps patients out of hospitals and in appropriate care settings in part through enabling the monitoring of chronic conditions outside of the clinical environment.
- Integrates electronic records and effective billing methods at each point of service.
- Allocates resources to those with appropriate skills in real time.
- Uses ICT for system coordination, access to records and data gathering, leading to accountability.
- Facilitates easy information access through multiple sources, including mobile telephones.
- Blends base funding and payment by activity (for example, micropayments through m-commerce adoption).¹⁶
- Assists in collecting community and clinical health data, and delivering healthcare information to practitioners, researchers and patients.
- Allows the monitoring of remote patients' vital signs in real time.
- Uses mobile telemedicine to directly provide care.¹⁷
- Allows healthcare professionals to engage in lifelong learning.
- Increases access to healthcare and health-related information (with special value for hard-to-reach populations).¹⁸

For practitioners, m-health provides a practical, real-time mechanism with which to keep and share records, record medications and make decisions about the course of care.

¹⁶ Commission on the Reform of Ontario's Public Services, "Public Services for Ontarians: A Path to Sustainability and Excellence." ed. Don Drummond (Toronto: Ontario Ministry of Finance, 2012), 13-15.

¹⁷ Panagiotis. Germanakos, Constantinou Moulas, and George Samaras, "A Mobile Agent Approach for Ubiquitous and Personalized eHealth Information Systems" (paper presented at the 'Personalization for e-Health' of the 10th International Conference on User Modeling, Edinburgh, 24 - 30 July 2005 2005).

¹⁸ The developing world has identified the following strengths of m-health, which resonate with challenges in the developed world: improving physicians' ability to diagnose and track diseases; providing timelier, more actionable public-health information; involving patients in care, and expanding health workers' access to ongoing medical education and training. See Vital Wave Consulting, "mHealth for Development. The opportunity of Mobile Technology for Healthcare in the Developing World," (2009). <http://www.unfoundation.org/what-we-do/legacy-of-impact/technology/mhealth-for-development.html>.

Devices that help to routinely collect and/or send information may encourage patients to take “ownership” of their health, and could promote early interventions that reduce the need for costly critical-care approaches. Pilot projects that use mobile technology in this way are already underway in Ontario, for example: the Bant app for youth with diabetes, the Re-ACT program for seniors who want to be in a community setting, and the virtual ward for surgery aftercare at Women’s College Hospital.

TRANSITION FROM ACUTE CARE TO CHRONIC CARE

Mobility is particularly suited to chronic care, in that it:

- Provides mechanisms for the ongoing monitoring of patients.
- Provides the capacity to communicate alerts to patients, caregivers and health practitioners as needed.
- Enables more individuals to move out from acute/on-site care facilities.
- Creates productivity gains, as practitioners in chronic-care settings are able to care for more patients.

M-health also facilitates a distribution of labour within an integrated system in which “nurses, nurse practitioners, personal support workers and other staff members can apply their full range of skills.”¹⁹ Expertise can be available as a remote resource that healthcare workers can access as needed.

ABI Research estimates that 15 million wireless m-health devices and sensors will be in place by end of 2012. A plan that can integrate the outputs of these devices with formal health care system data would ensure the ongoing relevance of the public system as more users begin to rely on informal sources for self-monitoring, prevention and communication about health issues. There is a need to ensure that health data is secure and private, especially in informal settings where privacy regulations may not be in place.

Mobile healthcare as a service and an industry may be stimulated through specific actions on the part of stakeholders. These solutions may be part of a broader action plan to support the infrastructure for and the privacy of mobile activity. An m-health solution must include strategies for interoperability, a clear regulatory framework for privacy and security, and a focus on preventative and remote care. Initiatives to enable remote care may also require new payment models and definitions of fees and services in order to encourage practitioners to adopt remote and mobile care solutions.

¹⁹ As described in Rain Rannu, Siim Saksing, and Triin Mahlakõiv, “Mobile Government: 2010 and Beyond,” (Mobi Solutions Ltd., 2010).

Government in a Mobile Ontario

DEFINITION

Mobile government (m-government) brings mobility—the integration of individuals, networks, institutions and devices—to the provision of government services, processes and public-sector activities, allowing individuals and systems to interact efficiently with government, and for government to provide first-rate, timely services.²⁰ M-government applications can be seen as tools for streamlining administration and the flow of information at all levels of government.²¹

M-government is especially suited to provincial and municipal government initiatives because of the greater frequency with which citizens interact with these services, and because of their regional focus. The Organisation for Economic Co-operation and Development (OECD) and International Telecommunication Union (ITU) note that m-government provides better service quality, efficiency and scalability, and helps to reduce costs.²² Some national initiatives go beyond m-government toward a broader notion of a “ubiquitous network society.” In this model, it is not a particular technology or setting that acts as the focus, but a general condition of ubiquitous connectivity that sits at the heart of governance itself.

While what constitutes an “m-government” action plan is still somewhat undefined, there are a plethora of global examples that suggest m-government will gain coherence and direction in the very near future. In particular, national strategies outlined in Scandinavia, Korea, Japan and India offer clear models worth examining in closer detail, and, in some cases, emulating.

OPPORTUNITY

Government in a mobile Ontario:

- Provides many cost-saving opportunities for government as well as for the citizen (e. g. , automatic data gathering, using SMS).

²⁰ There are many definitions of what constitutes “good” governance, but, in the context of m-government, Johan Hellstrom defines it as “characterised by participation, the rule of law, effectiveness and efficiency, transparency (built on the free flow of information), responsiveness, consensus orientation, equity, accountability, and strategic vision.” Similarly, Kuscu et al. assert that m-government offers at least four important areas of governance: 1) instant information release; 2) mobile transactions; 3) faster information exchange; and 4) increased feedback and participation.

²¹ Johan Hellstrom, “Mobile phones for good governance: Challenges and way forward,” in *World Bank Workshop on Mobile Innovations for Social and Economic Transformation: From Pilots to Scalable Implementation* (Washington D.C.: The World Bank, 2009).

²² OECD/International Telecommunications Union, “M-Government: Mobile Technologies for Responsive Governments and Connected Societies,” (2011).

- Closely aligns efficiency and improved service with cost savings through the reorganization of work process through m-government.
- Allows better management by providing sophisticated monitoring tools to ensure that services are delivered in the most efficient manner possible, helping government to manage allocated financial and human resources.
- Speeds up information flow to enable time saving and speedier data transfer, supporting more efficient decision-making.
- Enables government workers to access data at service sites through context- and location-aware mobility so that they can undertake tasks more efficiently. The same is true for government clients.
- Offers public services via mobile phone, which are available to a greater number of people than those offered on the Internet, as mobile penetration begins to exceed fixed Internet penetration.
- Provides a way to reach residents who are not willing to buy more expensive tethered personal computers, but who do have mobile phones.
- Improves access to services for individuals in remote areas who do not have wired access but do have wireless connectivity.²³
- Offers public announcements via mobile phone, which are accessible everywhere, at all times. This is especially important in case of urgent messages and crisis communication.
- Allows information to reach the preferred addressee at any time through one specific device, because the mobile device is designed for a single user.
- Uses mobile interfaces that can be highly personalized and meet Accessibility for Ontarians with Disabilities Act (AODA) standards of accessibility.
- Provides an open data resource that provides means for residents to engage with all manner of public information in order to affect decision-making.
- Allows engaged citizens can to monitor and report problems such as infrastructure breakdowns. Mobility makes it possible to create bottom-up participation, and ultimately to enhance citizen empowerment.

While connectivity is clearly still an issue in Ontario—especially in rural, remote and Native communities—m-government may have a role to play in improving connectivity for residents who have access to mobile services but not to broadband.

Ontario can develop a plan to integrate mobile services by moving from physical to mobile services (without an e-service stage) as part of its efficiency planning. The adoption of mobile technology by civil servants should lead to faster response times and a more efficient deployment of resources. As well, it will allow personnel to work both from home and on location, streamlining the use of office space and reducing costs of capital and infrastructure. A consolidated plan for replacing face-to-face

²³ Rain Rannu, Siim Saksing, and Triin Mahlakoiv, "Mobile Government: 2010 and Beyond. White paper," ed. Bernadett Koteles (Mobi Solutions Ltd., 2010). 7, 21, 99.

service with mobile capacity (automated as appropriate) should be part of the government's plans as it considers the *Public Service for Ontarians: A Path to Sustainability* report. *Taking Ontario Mobile* further emphasizes the value and efficiency that mobile technologies can bring to healthcare productivity, education and post-secondary education. Ontario, working closely with the private sector, needs to ensure that residents can access mobile services. In particular, location-based and context-aware services as well as simple information provision and m-commerce applications could provide significant savings.

Commerce and Finance in a Mobile Ontario

DEFINITION

Mobile commerce (m-commerce) refers to a secure and flexible system that allows consumers to make just-in-time payments remotely or at the point of sale by using a device. M-commerce is any transaction “involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.”²⁴ These practices are also referred to as mobile finance, which encompasses traditional banking and financial-service institutions (such as credit- and debit-card companies) and beyond. Consumers, in many cases, are already using their phone as a mobile wallet when purchasing applications (apps). In order to move outside of the existing bill-to-phone relationship, consumers tether²⁵ their phones to an existing payment method—one that mimics the kind of payment method traditionally found in the wallet.

OPPORTUNITY

Commerce and finance in a mobile Ontario:

- Empowers the consumer by shifting the information-retrieval and power equation from the store to the shopper.
- Deepens customer engagement.
- Enhances customer service.
- Creates persistent relationships with customers.
- Links sales, marketing and fulfillment between virtual and physical channels.
- Is personal, because the mobile wallet is tied to individual identities and social personalities.
- Solves a derivative problem for brands: how to effectively monetize and complete commerce transactions within cyberspace.

²⁴ Stephan Buse Rajnish Tiwari, “The Mobile Commerce Prospects: A strategic analysis of opportunities in the banking sector “ (Hamburg: Research Project Mobile Commerce, Institute of Technology & Innovation Management .Hamburg University of Technology, 2007).

²⁵ Melanie Pinola, “What is Tethering?,”

- Transforms the in-store retail experience, allowing price comparison and mobile check out.
- Creates opportunities to continue building Ontario's successful financial industries.
- Creates opportunities for design-based and skilled jobs in retail as sales-force jobs are replaced by mobile transactions.

DISRUPTION AND OPPORTUNITIES FOR NEW PLAYERS

M-commerce influences the productivity of consumers, merchants and retailers. One of the greatest challenges for businesses is to understand how to use mobile solutions within their business models. The face of m-commerce is still undeveloped, and the area is ripe for design, creating opportunities for the traditional finance sector and for new players. At times, m-commerce bypasses not only the banking industry but also traditional distribution partners like retailers and resellers, as mobile operators, retailers and online brands move into the high-margin financial service market.

For some businesses—particularly manufacturers, online brands, start-ups and developers—the mobile channel represents a new way to reach customers more directly, anywhere and anytime. Over the past few years, near field communication (NFC) has emerged as the favoured solution for connecting phones to transactions at points of purchase.²⁶

About 90 per cent of Canadian banks have their headquarters in Ontario. Canada's banks have a long history of leading banking innovation and should be able to rise to the challenge of m-commerce. Canada has the highest rates of electronic-payment usage through debit and credit cards, and the highest rates of online banking usage. Moreover, Ontario was the first region in North America to invest in chip-card technology.²⁷ Ontario banks can continue this type of leadership with m-payments.

The mobile wallet is an important actor in the future labour market. Ontario's retail outlets will need to adopt m-commerce strategies if they are to survive in a competitive world in which global commerce has moved onto the mobile platform. Canadian businesses have lagged behind those in jurisdictions like the US in making use of the web and e-commerce, and we cannot afford to repeat this with m-commerce. When Ontario consumers reach into the cloud to make purchases,²⁸ they are using the commerce storefront of American companies such as Amazon and Yahoo. A proactive position by Ontario stakeholders will enable Ontario and Canada to avoid American control of m-commerce, which

²⁶ NFC is a machine-to-machine short-range wireless connectivity payment system that sits on top of the same tagging technology that is used to track household pets and make unpaid-for items set off store alarms. We call this radio-frequency identification (RFID), and it can be used to enable a two-way communication channel for multiple services.

²⁷ Economy Watch, "Canada Credit Cards," Stanley St Labs., <http://www.economywatch.com/canada-credit-cards/>.

²⁸ Cloud computing is the delivery of computing as a service rather than a product, whereby shared resources, software and information are provided to computers and other devices over a network.

would avoid loss of jobs and revenues as well as exposure of Canadian data to another country's scrutiny.

Mobile marketing in Canada is projected to grow from less than \$50 million last year to more than \$1.5 billion cumulatively over the next five years. With Ontario and the greater Toronto Area being prime drivers of marketing activity in Canada, it is essential to embrace the opportunities this will afford to grow the creative and technical skills necessary to help brands and individuals benefit from the efficiencies and effectiveness of mobile marketing and its twin, m-commerce. At the same time, the mobile sector needs to ensure rigorous security and privacy standards for its customers.

Entertainment in a Mobile Ontario

DEFINITION

Audiences are actively searching platforms like the Internet and mobile for content, and consumers are spending an increasing amount of their time with non-traditional screens.²⁹ Mobile entertainment (m-entertainment) refers to the experience of consuming media through mobile platforms that may or may not rely on the user's current location to bring further context to the presented media. Mobile media provides the user with the "ultra-media" capability of accessing media of any kind, anytime and anywhere. This trend is described as "SoLoMo": social, local and mobile. Mobile moves the potential for media consumption into locales that until recently either didn't exist or were reserved for other kinds of media; in essence, mobile is the unfixed web married to sensors, data and computer processing. For example, commuters now use screened devices at times they may have previously reserved for listening to the radio or reading newspapers. The result is that people are spending more time engaged with media entertainment; hence, revenue growth in the media sector is primarily from new sources.

There are many kinds of mobile experiences, such as the delivery of non-interactive media (where the device is used as a media player), standalone, locally interactive apps (where the device is used like a computing device) and interactive mobile apps that often rely on connecting to networks and other devices. An important shift with the emergence of HTML5 will be the movement of some m-entertainment directly onto the mobile Internet. We are also seeing the aggregation of apps to enable search and brand recognition.

OPPORTUNITY

Entertainment in a mobile Ontario:

- Provides new opportunities to build Ontario's already powerful entertainment industries through

²⁹ Jacob Nielsen, "Transmedia Design for 3 Screens - Make That 5," <http://www.useit.com/alertbox/3-screens-transmedia.html>.

adding multiple consumption channels and screen time, thus bringing new revenue streams and business models.

- Can extend Ontario's wider cultural and tourism industries to international markets.
- Acts as an extension channel for traditional media.
- Is a gateway for accessing international markets.
- Is designed with attention to two form factors: visual acuity and flexibility, thereby broadening appeal across generations.³⁰
- Leverages the "app" software and app-store model, which has required Ontario producers to build relationships with platform buyers and distributors.³¹
- Builds on the emergence of HTML5, which will see the movement of some m-entertainment directly onto the mobile Internet.
- Enables search and brand recognition through the aggregation of apps.

Ontario faces the transition to mobile media with strong resources. The province has a robust and multidimensional creative-industry sector³² that ranks third in employment and is among the world's strongest in revenue generation.³³ Creative industry GDP is now larger than Ontario's energy industry, is approaching 70% of the auto manufacturing sector and surpasses those of agriculture, forestry and

³⁰ Suzanne Stein, "2020 Media Futures Trends Package," (Toronto: OCAD University & sLab, Super Ordinary Lab, Changeist, 2010).

³¹ The app software model is clearly working: ABI research shows that more than 18 billion apps had been downloaded in the Apple marketplace by October 2011, and more than 10 billion had been downloaded in the Android marketplace by December of the same year. Larry Johnson, Samantha Adams, and Michele Cummins, "The NMC Horizon Report: 2012 Higher Education Edition," (Austin, Texas 2012).

³² "The creative industries in Ontario generate \$12.2 billion in GDP for Ontario's economy annually and are number one in Canada by GDP." Ministry of Tourism Culture and Sport, "Ontario's Entertainment and Creative Cluster: A Framework for Growth," (Toronto 2010). The Ontario Ministry of Tourism and Culture provides a comprehensive overview of Ontario's creative industries, which include significant resources to produce m-entertainment (including core arts and cultural workers such as those in film and television, supporting industries such as design, and wider creative industries such as software development) and opportunities for the application of mobile content across many industries, including publishing and fashion. See the forthcoming report by Kathleen Webb et al., *Mobile Innovation: Ontario's Growing Mobile Content, Services, and Application Industry*. Toronto: Mobile Experience Innovation Centre, 2012. Also of value is *Ontario's Creative Cluster Study* (2009), http://www.mtc.gov.on.ca/en/publications/Creative_Cluster_Study.pdf.

³³ Charles Davies proposes that the total aggregate revenues of the screen-based segments of the Ontario media industry were \$6.2 billion in 2006-07, of which around \$4.5 billion was from the Toronto region. He provides an excellent analysis of strengths and weaknesses of the cluster in, Charles Davis, "The Toronto Media Cluster: between culture and commerce," in *Media Clusters: Spatial Agglomeration and Content Capabilities*, ed. Charles Karlsson and Robert G. Picard (Cheltenham, UK; Northampton, MA, USA: Edward Elgar Pub, 2011).

mining sectors combined.³⁴ The final report by the Toronto-region Consortium on New Media, Creative, and Entertainment R&D (CONCERT)³⁵ shows that Ontario has a history of quality production and breadth across cultural sectors, especially within screen-based industries. The overall Canadian sector, with its base in Ontario, represents a faster growth number than the Canadian economy: despite the recent recession, 1.1 million Canadians are “estimated to owe their jobs (directly or indirectly) to creative industries.”³⁶ Between 1999 and 2007 the Ontario sector grew at a rate of 38.3 per cent—well over the 17 per cent overall growth of jobs in Ontario.³⁷ Federal regulations, federal and provincial funding policies that favour Canadian firms and economic-support mechanisms from both federal and provincial programs have played an instrumental role in the sustainability of these industries.³⁸

Innovation in the digital-media sector requires responsive market intelligence, strategic foresight, fast prototyping (agile development) and usability, as well as an entity able to take risks in order to propel the consortium of companies forward.³⁹ Development is no longer staged—testing of new products needs to happen in the marketplace as others come on-stream.

To further understand the needs and potential of mobile creative industries, we refer readers to the in-depth analysis of the mobile industries developed by the Mobile Experience Innovation Centre and presented in its *Mobile Innovation: Ontario's Growing Mobile Content, Services, and Applications Industry 2012* report which provides in-depth analysis of the needs of the m-entertainment industries in Ontario.⁴⁰

Inclusion and Access in a Mobile Ontario

DEFINITION

Ensuring inclusion is in the interests of industry, the public sector and government. The ability to access and make use of ICT should be viewed as “digital capital” that conveys advantages and opportunities similar to those that result from access to more traditional forms of economic capital.⁴¹ Inclusion

³⁴ Ministry of Tourism Culture and Sport, “Ontario’s Entertainment and Creative Cluster: A Framework for Growth.”, 4

³⁵ Consortium on New Media, “Creative and Entertainment R&D in the Toronto Region,” ed. Luigi Ferrara (Toronto 2008).

³⁶ Ministry of Tourism Culture and Sport, “Ontario’s Entertainment and Creative Cluster: A Framework for Growth.”, 5

³⁷ Ibid.

³⁸ Scott Earl McKinnon, “From Cultural Nationalism to Regional Development: Examining the Growing Role of Canada’s Provincial Cultural Agencies in the Support of the Nation’s Cultural Industries During the Era of Globalization” (Ryerson, 2008). This report underscores the importance of provincial intervention in maintaining a healthy industry.

³⁹ MEIC, “Digital Economy/Digital Society: A Submission by OCAD University,” Government of Canada, <http://www.ic.gc.ca/eic/site/O28.nsf/eng/O0330.html>.

⁴⁰ MEIC, “Mobile Innovation: Mobile Content, Services, and Applications Industry 2012.”

refers to the removal of barriers to mobile access experienced by residents of Ontario due to socioeconomic factors, lack of mobile infrastructure and unmet functional needs (e. g. , a screen magnifier for users with low vision). Seniors (65+), Ontarians with disabilities, Aboriginal people, immigrants, and rural- and low-income residents are often underrepresented in the mobile market. Providing access enables full participation in social, academic and economic spheres. Barriers due to markets, costs and functions mean that the groups most likely to be excluded from the rapidly evolving mobile marketplace are the same groups that would disproportionately benefit from the increased access to public services, economic inclusion, jobs and productivity that these new technologies will offer.

OPPORTUNITY

Mobile inclusion is possible if government, industry and the not-for-profit sector work together to address these issues:

- Statistical analyses show that absolute cost is the foremost barrier to computer and wireless phone usage.⁴² Canada still has the world's most expensive data tariffs, which, according to user surveys, inhibit full mobility.
- For many rural and remote communities, reliable cellular service is unavailable. Respondents told us that future mobile-infrastructure development is a critical issue for populations outside major urban centres.
- Aboriginal communities in remote areas often have multiple barriers to accessing mobile technologies such as economic, infrastructure and language. Barriers to accessing mobile technology for Aboriginal people may extend to those who live off reserves in rural or urban areas where, even if coverage is available, tariffs are prohibitive.
- Mobility is closely linked to independence for people with disabilities. In 2026, the majority of people with disabilities will be 65 years of age or older—some 3.05 million people.⁴³

Access and inclusion is the cornerstone of a comprehensive mobile Ontario action plan and requires that cost barriers, geographic barriers, functional barriers (such as technology and interface design) and cultural barriers be addressed, and initiative taken to remove them.

⁴¹ Michael .J. Stern, Alison.E. Adams, and Shaun Elsasser, "Digital Inequality and Place: The Effects of Technological Diffusion on Internet Proficiency and Usage across Rural, Suburban, and Urban Counties," *Sociological Inquiry* 79, no. 4 (2009).

⁴² Menzie D. Chinn and Robert Fairlie, "The Determinants of the Global Digital Divide: A Cross-Country Analysis of Computer and Internet Penetration," in *Working Paper Series* (National Bureau of Economic Research, 2004).

⁴³ Toronto District School Board, "Facts and Statistics," http://www.tdsb.on.ca/_site/viewitem.asp?siteid=15&menuid=8564&pageid=7492.

Ontario's Mobile Capacity and Assets

Taking stock of Ontario's mobile ecosystem reveals a great depth of resources and capacity that, if deployed in a comprehensive manner, could provide the backbone for a mobile Ontario action plan. The term "mobile ecosystem" refers to interrelated spheres comprising the production, distribution, consumption and regulation of mobility. Ontario has a substantial network of mobile-related creators, researchers, innovators and manufacturers, who develop a range of services, including network components, infrastructure, handsets, software and applications. With the requisite regulatory approach and broad inclusion goals, this capacity will make it more plausible to coordinate a successful Ontario mobile action plan.

Ontario and Canada have already made significant investments in building Ontario's mobile leadership through investment in research, the training of highly qualified personnel, and infrastructure. Many large, globally successful mobile companies in each component of the mobile ecosystem are headquartered in Ontario. Ontario has important ICT clusters like the Greater Toronto Area (the GTA and the "Golden Horseshoe"), Kitchener-Waterloo-Guelph (the "Technology Triangle") and Ottawa Valley ("Silicon Valley North"). These developers cross many sectors, from education to preventative health and healthcare to marketing to entertainment to sustainability. However, the wavering of Research In Motion (RIM)—the former giant in mobile handsets and services—opens up important questions around the leadership and health of Ontario's mobile capacity.

Ontario is primarily served by three national telecommunications providers—Rogers, Bell and TELUS—but also has a number of regional carriers. As is the case in all of the jurisdictions we examined, market share in Ontario is dominated by a few big players in mobile Internet service provision. Rogers, Bell and TELUS control 97 per cent of the market, with shares of 47 per cent, 30 per cent and 20 per cent, respectively. Countries with only a few players achieve strong competition through effective regulation, price monitoring and self-regulation by industry.

Ontario boasts design programs and curricula at the university and college levels that support mobile development and graduate creative talent. Five of the top-10 institutions for mobile research in the country are located in Ontario: University of Waterloo, University of Ottawa, University of Toronto, Carleton University and Queen's University.⁴⁴ Ontario's colleges train mobile developers.

As well as possessing a capacity in wireless engineering, platform and application development,

⁴⁴ USNews, "World's Best Universities: Subject Rankings," U.S. News & World Report LP, <http://www.usnews.com/education/worlds-best-universities/articles/2010/09/21/worlds-best-universities-engineering-and-it>.

Ontario is a leader in three significant emerging technology movements:

1. The “Internet of Things” (IoT), which is an emerging concept that is in the process of being recognized by analysts as “the next big thing”; it is an array of connected everyday devices (such as appliances) that may be controlled or may send data through digital networks.
2. The “maker” movement of do-it-yourself technology tinkerers who work on ideas, experimentation and pre-commercial prototypes.
3. Augmented reality, which is a live view of the world that is enhanced by computer-generated media such as sound, images or GPS data.

What Ontario Residents and Experts in the Field Told Us

Our survey respondents reflected the growing interest and use of mobile technology that was identified in our expert interviews and in other jurisdictions. In our sample,

- 99 per cent of respondents reported using some form of mobile technology, and
- 77 per cent owned a cell phone.

Respondents indicated that mobile technology has a great importance, and showed a strong interest in accessing more services through mobile technologies (78 per cent) and learning about how mobile technologies can augment or replace common tasks (74 per cent). High cost as a barrier to access and perceived lack of competition between carriers were common themes in our discussions and interviews with experts. This concern is reflected by our survey respondents: 83 per cent indicate that they feel overcharged for their service-delivery option. Of our respondents,

- 83 per cent were interested in using mobile devices to carry non-sensitive information like loyalty cards, and
- 40 per cent wanted to have sensitive information such as identification and credit cards on a mobile device.

We found that industries currently use mobile for customer-service applications, media delivery, marketing and internal productivity. Industry respondents led us to conclude that:

- Large companies prioritize productivity gains, while small and medium enterprises (SMEs) are more interested in the innovation that mobility can bring to their products. Industries have seen the advent of mobile technologies and believe that their trade associations are aware of the importance of the “mobile turn.”
- The vast majority believed that consumers want more mobile services, and that providers know they needed to provide these services to remain current.
- Mobility is used for these tasks: advertising, archiving, payment, desktop replacement, on-the-go document preparation, GPS mapping and directions, technical documentation, location-based

information, 24/7 customer relationship management (CRM), product development, market research, product marketing, social networking, marketing, and voice and email content.

- The most common use of mobile technology reported by our respondents was voice and email contact with employees (75 per cent), followed by social networking (41 per cent).
- Less significant uses such as “on-the-go document preparation” and “payment mechanism” indicate trends for the future, as mobile becomes ubiquitous.
- Companies are concerned about the cost of going mobile in Ontario and issues of security and talent procurement.

The relatively low rates for uses of mobile technology outside of communication suggest that there is still a great deal of room to educate consumers, companies and the non-profit sector about the potential of mobile services, as well as to develop and implement mobile services across all sectors. Non-mobile industries require opportunities to interact with mobile developers.

Risks to Ontario in Failing to Adopt Mobility

This report establishes that we live in a world in which mobility is driving the modernization of the developing and advancing worlds. Mobility is shaping the experiences and expectations of residents across the province. Ontario has built significant infrastructure to excel in the mobile world, but needs to act now with comprehensive policies and an action plan.

Failing to act now will disadvantage Ontario in numerous ways. To name just a few: affordability issues will mean a widening gap of disadvantage for those who cannot afford mobile access, private-sector businesses will miss out on economic opportunities, financial-services organizations will lag behind their global counterparts, government services like healthcare will miss out on significant efficiencies of operation and quality of care, and students will miss out on skills they will need to compete effectively in a competitive, technology-infused world.

Action Plan for a Mobile Ontario

We developed our call to action for a mobile Ontario using the following resources: 1) best practices derived from our review of jurisdictions with comparative challenges and resources; 2) analysis of current Ontario government priorities, initiatives and policy; 3) analysis of federal initiatives regarding spectrum and regulation; 4) extensive secondary research concerning key sectors, as well as infrastructure, technology, social impact, culture and economy in the context of mobility; 5) data collection and analysis of the needs, capacities and plans of Ontario residents, industries and public entities; and 6) foresight work that derived best-case scenarios for mobility.

In developing a call to action, we addressed opportunities for: industry (either as a whole or in critical sectors); public and non-profit entities (academia, healthcare sector) and government. Some proposals require action on the part of one entity, while many others require collaboration. In moving forward

toward a mobile Ontario, government would do well to convene a voluntary advisory council that can assist in implementing the proposed action plan.

Throughout our research a number of recurring themes emerged, such as:

- The need to facilitate affordable access to mobile broadband and devices for Ontario residents.
- The value of a comprehensive regional mobile policy, as exists in other jurisdictions.
- The importance of secure services and privacy protection in a form that encourages mobile take-up by creating confidence, and enables private-sector development while protecting residents.

Other elements of our action plan focus on the potential of the five specific sectors we analyzed. Finally we provide a series of aspirational proposals that aim to:

- Build mobile capacity in Ontario's non-mobile sectors in order to ensure the Ontario economy is competitive.
- Ensure job development and the retention of a mobile industry in Ontario.
- Provide means for citizen engagement and inclusion.

The action plan and a timetable for their implementation are found on page 190 of this report. The chart below provides a schematic of each theme.

Theme	Description
One	The Need for an Ontario Mobile Policy
Two	A Mobile Ontario Requires Ubiquity, Accessibility, Quality Infrastructure and Affordability
Three	Creating Confidence in Mobile Services: Privacy, Security and Consumer Protection
Four	Increased Quality, Accessibility and Productivity in the Delivery of Healthcare
Five	Increased Quality, Accessibility and Productivity in the Delivery of K-12 Education
Six	Increased Quality, Accessibility and Productivity in the Provision of Post-Secondary Education
Seven	Increased Productivity and Quality in the Provision of Government Services
Eight	Increased Productivity, Accessibility and Quality across Ontario's Non-Mobile Industries
Nine	Job Development and Retention to Build a Strong Mobile Business Sector
Ten	Citizen Engagement and Inclusion

We have identified actions that can be implemented immediately and that do not necessarily need new budget or long investment-analysis cycles. These actions are not inextricably linked, and all combine to add merit to the overall goal of making Ontario a centre of mobile excellence.

We further believe there would be distinct advantage in bringing together a common brand—a mobile Ontario initiative—under which all of the actions could be moderated. There would be synergies and efficiencies, especially where collaborations are needed across parties such as industry, academia and government.

We have identified a number of high-priority “quick wins” that will give momentum and credence to the overall ambition of taking Ontario mobile, which will require a balanced commitment across the private sector, all levels of government and academia.

Figure 01: High-Impact Actions

Action	Timeline	Proposed Owner
Creation of brand “Ontario” as a centre of mobile excellence	Winter 2013	MEDI & Ministry of Tourism, Culture and Sport
Government to recognize mobile-health solutions that promote prevention	Apr. 2013-Oct. 2013	Ministry of health
Support mobile-learning projects as part of MTCU Innovation Fund	Dec. 2012- Mar. 2013	Ministry of Training Colleges and Universities
Create plan to use mobility to increase responsiveness and productivity of government services	Oct 2013–Oct 2014	Ministry of Government Services
Promotional awareness campaign of m-commerce benefits to non-mobile	Dec 2012–Mar 2013	Ministry of Economic Development and Innovation
Government to establish voluntary advisory council to offer advice , coordinate action and align programs to make Ontario a centre of excellence for mobile	Fall 2012–2014	Ministry of Economic Development and Innovation
Initiate m-commerce task force across industry and government for privacy and security	Fall 2012	Ministry of Consumer Services
Commission study to assess impacts of mobile learning in K-12 and PSE	Dec 2012–2013	MTCU and Ministry of Education
Investigate potential of ORION as network option	Fall 2012–Summer 2013	ORION

Figure 01: High-Impact Actions (Cont.)

Action	Timeline	Proposed Owner
PSE to direct research efforts into mobile industries	Winter 2013–Fall 2015	Universities and Colleges
Academia to collaborate with industry to develop experiential-learning programs	Winter 2013–Fall 2015	Universities and Colleges
Enhance training for app developers	Fall 2012–2014	MEIC
Industry to collaborate with health-sector subject-matter experts to create standards, services and applications	Oct 2012–Mar 2014	Mobile Industries and Ministry of Education
Industry to build consortium with publishers, e-learning sector and teachers to migrate Ontario-appropriate content to mobile platforms	Dec 2012–Oct 2013	MEIC, School Boards & Ministry of Education
Industry to collaborate with PSE subject-matter experts to develop and disseminate applications	Dec 2012–Mar 2014	MEIC, COU & Colleges Ontario
Industry to collaborate with government to develop and test productivity tools	Mar 2013–Oct 2014	MEIC & Ministry of Finance
Finance sector to collaborate with government to incentivize angel investment	Winter 2013–2014	MEDI
Government to work with commercial developers on “mobile alert system”	Mar 2013–Oct 2013	Ministry of Community Safety and Correctional Services
Mobile industries to establish consortium approach through associations to fast-track mobile and application adoption in non-mobile industries	Fall 2012–Fall 2014	MEIC with MEDI

