Canada Must Make Broadband Infrastructure a Priority

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Abstract: This article argues that just as universal access to traditional communications media, such as the post office and the telephone, is considered an essential service, so also should access to high-speed Internet, particularly in areas that currently lack the infrastructure to make this possible. This paper illustrates the need for high-speed Internet connectivity, or broadband access, in remote and rural areas of Canada. The article outlines the rationale for establishing high-speed access throughout Canada and provides an overview of infrastructure implementation barriers faced by the private and public sectors. It concludes with a discussion of the ways in which community-based networks could play a role in the strategic planning, implementation, and application of broadband infrastructure.

Résumé : Cet article soutient que, de la même manière que l'on en est venu à considérer comme essentiel l'accès universel aux médias de communication traditionnels comme la poste et le téléphone, on devrait considérer comme essentiel l'accès à Internet à haute vitesse, particulièrement dans les régions qui n'ont pas encore une infrastructure de base pour Internet. Cet article explique le besoin d'une connectivité Internet à haute vitesse ou à large bande dans les régions isolées et rurales du Canada. Il justifie pourquoi il est raisonnable d'établir l'accès à haute vitesse partout au Canada et offre une vue d'ensemble sur les barrières que les secteurs public et privé doivent surmonter avant de pouvoir instaurer une infrastructure. Il conclut en discutant comment les réseaux communautaires pourraient jouer un rôle dans la planification, l'établissement et le maintien d'une infrastructure à large bande.

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Introduction

High-speed Internet is an essential service, particularly in rural and remote Canada. In these areas, distance and low population densities have traditionally resulted in inequities related to technology infrastructure and services when measured against urban centres. It is unfortunate, if ironic, that the applications actually designed to level the playing field for people living in rural and remote areas —telemedicine, distance education, and video remand—are beyond their reach, because they don't have the physical infrastructure needed to support them.

Few would argue that universal access to traditional communications media, such as the post office or the telephone, is unreasonable. To dispute the fact that high-speed Internet is now a virtual necessity is to ignore the evolution of communication over the past decade, and to relegate many Canadians to the wrong side of the "digital divide" (Reddick, 2000, p. 2) merely by virtue of where they live.

In June 2001, Canada's Minister of Industry, Brian Tobin, released the findings of the National Broadband Task Force, a consortium of public- and private-sector stakeholders from across the country. Entitled *The New National Dream: Networking the Nation for Broadband Acce*ss (National Broadband Task Force, 2001), the report advised the government on how best to achieve its goal of providing high-speed broadband access to all Canadians by 2004. It elaborated on the concept of a digital divide in Canada, and discussed the economic and social development opportunities inherent in universal connectivity. The high-profile report suggested a $1.3-billion price tag to establish equitable access to all communities.

Universal access to Internet technology has the potential to revolutionize communication and distribution applications in four main areas of interest to Canadians: business, education, health, and culture.

The evolving global marketplace has exerted considerable pressure on Canadian businesses. Business-to-business (B2B) e-commerce is transforming traditional operational models, reducing costs for both the business and consumers. For example, using on-line "e-markets" to aggregate demand and negotiate better prices can result in cost savings of up to 39% for businesses and organizations (Goldman Sachs, 1999, p. 18). Suppliers of B2B products and services realize higher profits from increased operational efficiencies, better client relationships, and lower inventory costs. Although Canada ranks first in the world in Internet use (Internet Industry Alamanac, September 2000), on a per capita basis Canadian business owners are well behind their U.S. and European counterparts in establishing B2B initiatives (Goldman Sachs, 2001, p. 9). Investing in more infrastructure to ensure access—particularly in the remote areas that generate Canada's commodity products—may help close the gap.

High-speed access has enormous implications for bridging educational gaps in remote and rural Canada. For example, where videoconferencing technologies are in place, secondary students can virtually attend classes in urban centres, increasing the variety of courses available to them. The Internet also provides easy

access to educational materials, on-line courses, resources, and reference materials for students of all ages, regardless of where they live.

However, adoption and integration of this application is occurring at uneven rates throughout the country. Last year, a study by the Toronto District School Board found that 73% of its students have high-speed Internet access at home. Toronto is the largest city in Canada, with arguably the best access to broadband technologies. This high penetration rate is driving a new, bandwidth-intensive standard for the development of educational Internet content. This marginalizes the students and teachers unable to access new materials because of access limitations.

In Canada, where universal health care is an essential part of the Canadian identity, telemedicine is perhaps the most significant development in Internet-application research. The potential for cost savings, as well as more intangible social and health related benefits, is remarkable (Siman, 1999, pp. 12-14). Pilot projects in telepsychology, for example, found that over and above the cost savings resulting from reduced travel, outpatients may establish rapport faster when the consulting physician isn't actually in the room with them.

The protection of Canadian culture is an important social issue that may be addressed, in part, with evolving Internet technology and applications. Nearly 90% of the content on the Internet is in English, and most of that is driven by American developers (InterNet Consulting, 2001, p. 33). There is tremendous opportunity to promote and protect Canadian culture using Web-enabled technologies, especially given Canada's position as a world leader in Internet use. But where will the content come from, and who will pay for it? The argument over which should come first—the connectivity or the content—will, like the chicken-or-the-egg conundrum, perhaps never be resolved in a satisfactory manner. It is certainly true that a rudimentary Internet search reveals an alarming lack of Canadian, Aboriginal, and non-English content on the Web (InterNet Consulting, 2001, p. 33). Given the relative population of Canada in the global Internet context, it is perhaps not surprising that American sites are in the majority. However, when one reflects on the paucity of Aboriginal or French language Web pages within the Canadian site database, one cannot help but make a correlation between lack of content and the lack of infrastructure in the areas where the majority of these populations live.

Barriers to establishing universal access

The urban versus rural divide

Immediately after the release of *The New National Dream*, it became apparent that most Canadians didn't completely understand the rationale for establishing connectivity throughout the country. The conservative elements of the national media gleefully derided Brian Tobin's "superhighway to nowhere" strategy (Wahl, 2001, p. 18) and grumbled about the enormous expense of high-speed surfing in the backwoods. Perhaps this was to be expected, given that 73% of Canadians live in urban areas. Most have little concept of what it's like to live in a town 400 kilome-

tres from the nearest university or 200 kilometres from the nearest hospital. However, the fact that such a large proportion of the population doesn't understand the importance of the report creates significant political challenges. The proposed expenditure must be debated in Parliament first, and the majority of MPs represent urban populations that are already well connected.

Public uncertainty over financial implications

Many Canadians perceive the connectivity agenda as a questionable expense, when in reality it is an investment with the potential to generate significant socio-economic and financial returns in the long term. Distance-education applications, telemedicine, and on-line government services provide rural and remote Canadians with equal access to a wide range of services, usually at lower cost. This is largely because the distance between rural communities and the urban centres where such services are concentrated no longer presents a barrier or a cost issue (National Broadband Task Force, 2001).

Current connectivity perception

Another factor in Canadians' perception of the need for this investment is the bewildering variety of reports and statistics indicating that Canada is one of the best-connected countries in the world. National connectivity statistics, even when accurate, can be misleading. For example, a recent Organisation for Economic Co-operation and Development report cited that in 2000, 69% of Canadian households had access to DSL or cable services (Paltridge, 2001, p. 25). This appears to be an admirable accomplishment, given the geographic challenges presented by a large and sparsely populated country. However, it does not reflect the fact that the vast majority of these households are in the most densely populated areas of Canada, which account for only 21% of its municipalities. In other words, 79% of Canadian communities, most of which are in remote and rural parts of the country, do not have high-speed Internet access (Oliver, 2001, p. 1).

The social and economic implications of this distribution are considerable. High-speed access plays a vital economic-development role, not only in stimulating growth, but in maintaining existing businesses. As the global marketplace becomes a reality, businesses in small towns can remain viable only if they are able to effectively communicate with their suppliers and clients (R. Ramirez, 2001). High-speed access provides them with the most cost-effective medium to do so. Those without this infrastructure are at a social and economic disadvantage.

Varying perspectives on investment in technology

When faced with the issue of broadband spending, it's a reasonable assumption that most Canadians fall into one of two major categories: those who support investment in innovation, and those who do not. In the former group, there is another division, based on how the spending should be prioritized.

The difference between those advocating investment and those against might best be characterized in terms of political philosophy. On one side of the debate are those with a liberal, social-development approach, founded on providing subsidies to the "have-nots" to help them overcome regional disadvantages. On the

other side are the more conservative, economics-oriented, those who tend to evaluate projects based on a quantitative return on investment.

It's also important to note that even among community champions for technology development, there are two opposing schools of thought. One places the priority on better content development, claiming that the "build it and they will come" model is outmoded and risky. The other school of thought advocates prioritizing connectivity infrastructure, so that marginalized communities can begin to cultivate a stronger awareness and adoption of Internet technologies.

However, this debate need not be resolved with a zero-sum outcome, since establishing broadband access ultimately results in a win-win situation. An analysis of telemedicine applications provides a perfect illustration. While the initial capital investment in videoconferencing equipment and connectivity infrastructure may be high, the ongoing costs of providing medical care will fall. As our population continues to age, and demands on health providers increase, technology promises to increase both the efficiency and cost-effectiveness of our health care system.

The geography barrier

Eighty percent of Canada's population is concentrated in 20 percent of its landmass (Statistics Canada, 2002). The flip side of this statistic is the crux of the challenging environment that the private sector has faced to date. Private telecommunications carriers, most of whom are accountable to shareholders, have been the principal drivers in the development of the wire and cable networks that connect us. Without a compelling business case, the telecommunications sector has no incentive to build infrastructure in underserviced areas. Viability in any given region is usually driven by a critical mass, or regional density, of inhabitants that many communities can never hope to achieve.

It is important to note, however, that for many of these regions, an operational business case is possible given the right combination of strategic planning, demand aggregation, and public-private partnerships. In other words, if the private-sector telecommunications firms can access some publicly funded capital assistance, they can often generate a reasonable return on investment from sustainable operational revenues.

It is an indisputable fact that the Internet is being used more often as an alternative channel for the distribution of everything from government reports to retail goods and services. For a country with a widely dispersed population such as Canada, the Internet smoothes out regional inequities resulting from distance or population issues. It is a remarkable equalizer, treating the Internet user in Vancouver the same as the one in Inuvik, assuming, of course, that both have access to broadband infrastructure.

The lack of strategic planning

Well-meaning federal and provincial bodies throughout Canada unwittingly allocate funds for myriad technology projects with overlapping or duplicate objectives, often to groups lacking the range of resources needed to ensure successful implementation. This lack of co-ordination fails to realize potentially significant

economies of scale, given the limited resources available to remote areas of the country. There is a profound need for more regionally based strategic planning and co-ordination in rural and remote areas throughout Canada.

A related problem is the issue of "overcentralization." Technology-funding assistance programs, while greatly appreciated by the regions for which they are designed, are usually developed in major government centres, such as Ottawa, Vancouver, or Montreal. As a result, the project parameters may be impractical, infeasible, or irrelevant to remote and rural regions. In addition, final funding decisions are often made in these same "headquarters" branches, often after two or three lower "regional" levels of approval. The time it takes for a technology project to work its way through these systems can result in the eventual approval of a technically redundant project.

The role of community-based networks

For the purposes of this discussion, a community-based network (CBN) is a non-profit organization that facilitates partnerships between the private and public sector to improve technology infrastructure and services. Its projects may range from establishing fibre optics infrastructure to hosting technology career fairs for regional youth.

CBNs can ensure that federal, provincial, and municipal governments work together to accomplish connectivity and technology goals for the region while making the best use of limited financial and human resources. These community champions play a critical strategic planning role, working with individual municipalities to help them aggregate demand and achieve the economies of scale that would not otherwise be possible on an individual level.

CBNs such as the Timmins, Ontario–based Northeastern Ontario Communications Network (NEOnet) can also play a significant role in communicating the need for broadband infrastructure to Canadians at large. NEOnet is the CBN for an area spanning 200,000 square kilometres and more than 45 communities, only one of which has more than 10,000 people. Board members and staff regularly write letters to the media, distribute press releases, and conduct speaking tours explaining the cost-benefit rationale for investing in infrastructure.

A perfect example of how CBNs play a vital strategic planning and aggregation role in implementing technology projects is NEOnet's Cellular Enhancement project. When limited provincial funding to fill gaps in cellular coverage was announced, NEOnet took a leadership role in determining the need. Supported by all 45 communities as well as the private sector, NEOnet secured funding to study the entire region, addressing the cellular needs of all communities for a fraction of the cost had the municipalities tackled the issue individually.

Conclusion

Ultimately, the National Broadband Task Force report forces us to consider our core values as Canadians, with all of the responsibilities and shared obligations that they entail. It is a deep-rooted characteristic of the Canadian identity to advocate equal access to essential services, such as health care, education, and a wide

range of social services. However, Internet technology and its applications have evolved so rapidly that society has been unable to absorb all of their implications.

The communication paradigm has irrevocably changed with the advent of high-speed Internet. At the cusp of a new millennium, the information highway is now as important to Canadians as the railway was at the beginning of the last century. Indeed, broadband technology is only the most recent in a long tradition of transformational networks like the railroad. The equitable distribution of electricity grids, the highway system, the pipelines, and the telephone are the most obvious examples of the Internet's predecessors (Crandall & Jackson, 2001).

Investing in broadband infrastructure for all Canadians confirms our status as global leaders in the telecommunications sector. It allows us to better compete in the rapidly evolving new economy, and to maintain our reputation as the best country in the world in which to live.

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