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ACCESS TO THE INTERNET: A COMMUNITY-BASED APPROACH

**Background Paper for the
Information Highway Advisory Council**

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This background document was prepared to assist the Information Highway Advisory Council in its deliberations. The content of this document and the positions advanced are the responsibility of the author and do not necessarily represent the views of the Information Highway Advisory Council or of the Government of Canada.

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1.0 PREFACE

In March 1994, Industry Minister John Manley created an Information Highway Advisory Council (IHAC) to assist the federal government in developing a strategy for the Information Highway. During its first phase of work, the Council addressed 15 issues and provided more than 300 recommendations on how to ensure that the Information Highway meets the needs of individual Canadians.

One of the most important issues is access. Its report *Connection Community Content: the Challenge of the Information Highway* conveyed the clear message that to realize the promise of the Information Highway, it must be available to all Canadians. The report also contained a set of principles about how to ensure access to Information Highway facilities and services which meet the needs of Canadians. They are as follows:

- a) **Universal, affordable and equitable access:** local availability of basic access facilities for the delivery of Information Highway services at reasonable cost, regardless of geographical location; equitable opportunity for all, including people with disabilities and groups with special needs, to access and use the Information Highway.
- b) **Consumer choice and diversity of information:** to the maximum extent possible, provision of services will be driven by market forces. Consumer choice among a wide range of commercial and non-commercial information and services in a variety of formats should be available.
- c) **Competency and citizens' participation:** Canadians should be able to acquire a basic understanding and command of information technology to enable them to use and benefit from Information Highway services. The Information Highway must provide adequate opportunity for self-expression and participation in the information society and for controlling incoming and outgoing information.
- d) **Open and interactive networks:** full interactivity, interconnection and interoperability of networks; freedom to provide, circulate and exchange information.

Progress on these and many other of the Council's recommendations has been outlined in the government's May '96 Action Plan: *Building the Information Society: Moving Canada Into the 21st Century*. To assist government with further advice to complete the plan and to push for faster progress, the Council agreed to carry on additional work in six areas:

- the role of the Internet in the Information Highway;
- affordable and equitable access to essential communications services;
- new strategies to strengthen Canadian content and encourage the use of French on the Internet;
- initiatives for stimulating electronic commerce and technological innovation;
- measures to respond to changes occurring in the workplace; and
- building a lifelong learning culture in Canada.

The Council quickly agreed that its central theme – common to each of these issues – would be the Internet. The Council is developing a series of discussion documents on issues related to the Internet. This paper takes a look at access issues which are specific to the needs of individual Canadians.

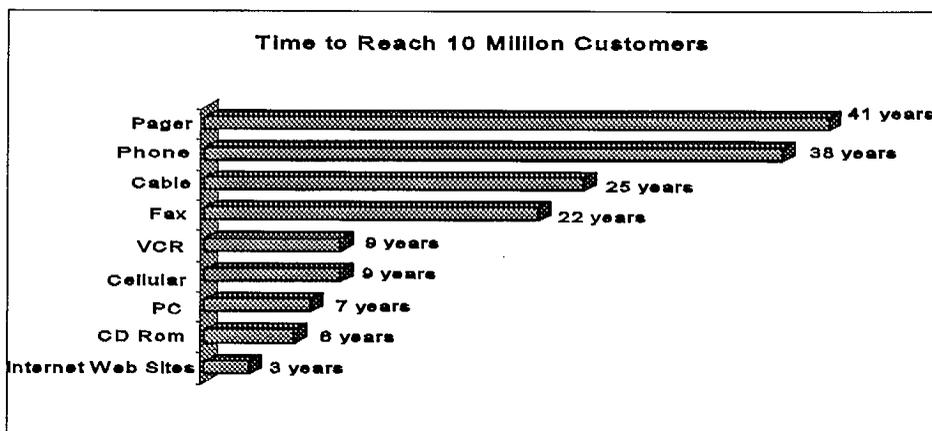
2.0

HOW IMPORTANT IS THE INTERNET?

"The best-known electronic network is the Internet, a dramatic illustration of how the new communications technologies have become more accessible. Once the preserve of research sciences, the Internet is now used by tens of millions of individuals in their businesses and everyday life."¹

Over the past three years, the burgeoning use of the Internet has popularized the concept of the Information Highway for Canadians. The Internet is a "vast international network of networks that enables computers of all kinds to share services and communicate directly".² The Council believes that the Internet will evolve and change dramatically, while growing in importance.

The Internet has already created a community of millions of individuals in over 100 countries. CyberAtlas estimates that at least 10 million people are using the Internet worldwide and the traffic level has been growing at rates of more than 10 percent per month for several years. The Internet achieved in just 3 years what it took the paging industry 41 years to accomplish: a penetration rate of 10 million users.



Source: Adapted from CyberAtlas 1996.

¹ Information Highway Advisory Council, *Connection Community Content: the Challenge of the Information Highway*, Final Report, September 1995.

² Information Highway Advisory Council, *Connection Community Content: the Challenge of the Information Highway*, Final Report, September 1995.

In Canada, the growth rate for computers with modems, today's tools to access the Internet, has been spectacular over the last two years. Statistics Canada reports: "Were these rates of increase to be sustained, universal access through households' own purchases of computer and modems would be achieved in the near future."³

In reality, however, as penetration rates rise, the rate of increase will decline. Inevitably, as with any technology, there will be some Canadians for whom access to the Internet is not available at rates they can afford. The Council has stated that the Internet should evolve within a competitive environment. The role of government is not to ensure individual connections; instead access may be achieved by establishing public access points in community schools, hospitals, libraries or other centers.

2.1 ACCESS TO THE INTERNET

IHAC stated that the full economic and social benefits of the Information Highway won't be realized unless Canadians have access to it. But what does this mean in terms of the Internet? What, in particular, should Canadians be assured of having access to?

In the view of IHAC, there are four important aspects to Internet access:

- training - the ability to develop computer literacy skills and a level of comfort with technology;
- services - the content and services that the network will carry;
- a network connection - the link to the communications network or infrastructure. This includes software and equipment which the user needs to have in order to log on to the network; and
- a stable policy and regulatory environment that enables widespread access to be achieved.

³ Dickinson, Paul and George Sciadras, "Access to the Information Highway", *Analytical Paper Series*, Statistics Canada, - 63F0002-XPB no. 9.

3.0

WHO'S USING THE INTERNET AND WHO'S NOT?

This paper was drafted to provide advice to Council regarding what should be considered as adequate in terms of access to the Internet for individual Canadians. To get a clear picture of how the Internet is evolving in Canada, a variety of studies, surveys and opinion research polls were analyzed. There is a growing collection of work in this area to consider. No one report gives the whole picture. Differences in objective, sample size, and methodology, make comparisons difficult.

We do know, however that the Internet is growing and changing more quickly than we are able to effectively measure. A survey done by Network Wizards found that as of July 1996 there were more than 12 million hosts, an increase of 9.5 million since January 1996.⁴ A common convention is to assume that ten people use each host computer on the Internet. On this basis, perhaps 1.2 billion people around the world have accessed the Internet.

Estimates of the number of Internet users in Canada last year range from 3 million to 8 million.⁵ There are predictions that this is the year that the Internet will become a mainstream medium as consumers discover the utility of the services available. On the other hand, there are also predictions that the "drop-out rate" will increase as most individuals choose not to become more than casual users.

We are, it seems, constantly on the threshold of a new direction for the Internet and every few months, things change. Clearly the Internet has not reached its natural settling point and we don't know yet whether it will deliver mass communications services. In order to plan for the access challenges which may emerge for individual Canadians in the future, the Council's Access Steering Committee concluded that there is a need for greater statistical clarity. In particular, it called for Statistics Canada to undertake more regular and comprehensive statistical research on Internet usage patterns and trends.

⁴ A host is any computer system connected to the Internet via direct or dial up connection. See CyberAtlas and Network Wizards survey, August 1996.

⁵ The Angus Reid Group estimated in 1996 that 30 percent of Canadian adults, or roughly 8 million Canadians, have used the Internet from home or work. A study done four months earlier by Nordicity Group in partnership with Nielsen Marketing Research found approximately 6.5 million Canadian users in 1995. The Nielsen survey for 1996 estimates that there are approximately 8 million Canadian users.

There are, however, some questions for which surveys and opinion research have provided remarkably consistent answers. For example, there is a consensus that the majority of people who use the Internet are male, well-educated and between the ages of 25 and 44. Of course, in the continuing quest to predict the future for this chameleon phenomenon, there is early trend information to suggest that this profile may be changing. A survey done in 1995 by Nordicity/Nielsen suggests that almost 45 percent of Internet users in Canada are female. In its 1996 survey, Nielsen reports that emerging Internet users are more likely to be female than male.⁶ Market research done by the U.S. *Yankelovitch Monitor*⁷ also discovered a growing number of women users, a growth pattern which is expected to strengthen. Another point of agreement is that Internet usage is beginning to expand beyond the early adopters to include people who are older than 44 and younger than 25 and those with lower incomes and less education.

3.1 THE EARLY ADOPTERS

Distinct portraits of two types of early users have emerged: students and academic users, and professionals or business users. The Nordicity/Nielsen study found that almost 25 percent of Canadian users in 1995 were students or educators. This figure is significant when we consider it in the context of census data which indicates that slightly more than 20 percent of the population, or 5.5 million people, is enrolled in elementary, secondary or post-secondary education.⁸

The business community, including professionals, managers, administrators and clerical workers are also well represented. In his paper *Information Technology and Citizen Participation*, David Neice characterizes these users in the context of two Internet worlds. "One world is the commercially driven access world where users are young, male, affluent, and seeking more status through Internet connections. While this is an important factor, the other world described involves the predominance of institutional supported use, at work and in the education system, which is after all where the Internet originated."⁹

⁶ ACNielsen, *Canadian Internet Survey 1996*, January 1997.

⁷ Smith, J. Walker, "Cybercitizens: Understanding the Audience On-Ligne", *Yankelovitch Monitor*, February 29, 1996.

⁸ Statistics Canada, *Education Quarterly Review*, Vol. 3, No. 3, 1996, Cat. No. 81-003-XPB.

⁹ Neice, David, *Information Technology and Citizen Participation*, a 1996 discussion paper on behalf of the Department of Canadian Heritage.

3.2 INDIVIDUAL CANADIANS: NEW WAVES OF ADOPTERS

Institutions are supporting the early adopters, yet the explosive rate of Internet growth suggests that new waves of users, and new patterns of use are already in sight. A look at spending patterns over a two year period shows the beginning of an interesting trend. The Nordicity/Nielsen study reports that in 1995, only 25 percent of Canadian users paid for the service themselves. Not surprisingly, most logged on at school or work for educational or business reasons. In 1996, Nielsen found that 42 percent of Internet users paid for the service themselves. This is supported by companion increases in the number of people who are logging on at home, and in the number of people who are using the Internet for personal communications and messaging services.¹⁰

The Council has suggested that access to electronic mail and messaging services will become increasingly important to individual Canadians. In the business sector, widespread access will be realized when the messaging services provide high-quality support for financial transactions and sensitive commercial communications, which in turn require privacy and integrity and the ability to verify identity and authenticity of correspondents.

Commercial service providers are responding to the need by establishing gateways and protocol conversion software to allow proprietary messaging systems to exchange plain-text and e-mail messages and enable widespread connectivity. For individual Canadians, widespread use will depend on these and other factors, including availability, price, affordability, ease of use and the utility of the services and content available.

3.3 WHO'S NOT USING THE INTERNET?

Even though the Internet is the fastest growing communications medium in the world, a critical mass of Canadian users has not yet been reached. In order to develop its advice on access, the Council took a closer look at some of the non-users and their concerns.

Canadians over 54

The largest group of non-users are people over the age of 54. Estimates of the proportion of users between the ages of 55 and 65 are between 1 percent and 5 percent.¹¹ Based on census data, close to 9 percent of Canadians are between the age of 55 and 64. Estimates of the percentage of Internet users in Canada over the age of 65, hover around 1 percent and 2 percent. Again, census

¹⁰ Nordicity Group Ltd./Nielsen Marketing Research, *Canadian Internet Survey 1995*, January 1996; and the ACNielsen, *Canadian Internet Survey*, January 1997.

¹¹ Based on a comparative analysis of Internet surveys for 1995 and 1996.

data tells us that 12 percent of Canadians are over the age of 65. This would suggest that older age groups are under-represented among Internet users.¹² Statistics Canada recently reached the same conclusion, noting that households headed by seniors and near-seniors have particularly low computer penetration rates and even lower modem penetration rates. "These rates first rose with age, then dropped markedly for households headed by people over 55. Even in the top quartile of the distribution, little more than one in four households headed by a senior had a computer, which represented roughly half the computer penetration rate for households with a head aged 35 - 44..."¹³

Rural Dwellers

Statistics Canada also traced a significant difference in Internet use between urban and rural households, a trend which raises questions about access and affordability.¹⁴ While telephone service is available to almost all Canadian households, access to the Internet requires a single line connection. In some rural and remote parts of Canada, only multi-party services are available. For others, there is no Internet access provider in their local calling area, which means they must pay long distance charges simply to gain Internet access.

Commercial service providers are responding to the challenge. The percentage of party lines declined from 3.7 percent to 1.5 percent of households between 1990 and 1995¹⁵ and in several provinces operators have ensured that Internet access is only a local call away, regardless of location within the province.

Lower Income and Education Groups

In 1995, the richest 20 percent of households were more than four times as likely to have a computer than the poorest 20 percent.¹⁶ Of those who do have computers, the majority of users

¹² Statistics Canada, *1991 Census of Population; and Percentage Distribution of Population by Selected Age Groups, by Province, 1986, 1991, and 1994.*

¹³ Dickinson, Paul and George Sciadras, "Access to the Information Highway", *Analytical Paper Series*, Statistics Canada, - 63F0002-XPB no. 9.

¹⁴ Dickinson, Paul and George Sciadras, "Access to the Information Highway", *Analytical Paper Series*, Statistics Canada, - 63F0002-XPB no. 9.

¹⁵ Statistics Canada data compiled by Industry Canada.

¹⁶ Statistics Canada, *The Daily*, January 12, 1996.

have a college degree or more, and live in middle to upper income households in urban areas. This same pattern is seen in the United States and in Europe.¹⁷

The Council believes that the Internet delivers social and economic value to those individuals using it effectively. The question is whether individual use of the Internet, like the use of television, telephones, radio and video cassette recorders, will accelerate for individuals with lower income and education attainment levels. Will the arrival of WebTV and other types of terminal devices significantly change usage patterns?

With low end jobs disappearing, we can't afford to leave anyone behind. As networking becomes the highway to commute to work, we need to ensure that income does not become the required passport to travel. Social and economic policy analysts have documented the disturbing tendency of new technology to polarize society into information haves and have-nots.¹⁸ The Internet is currently reflecting the classical technology development pattern, but, as a medium for network based learning and training, it carries the potential to break through this trend of inequity. For this reason, the Council concluded that access to the Internet should be the focus of a national access strategy.

French-language Users

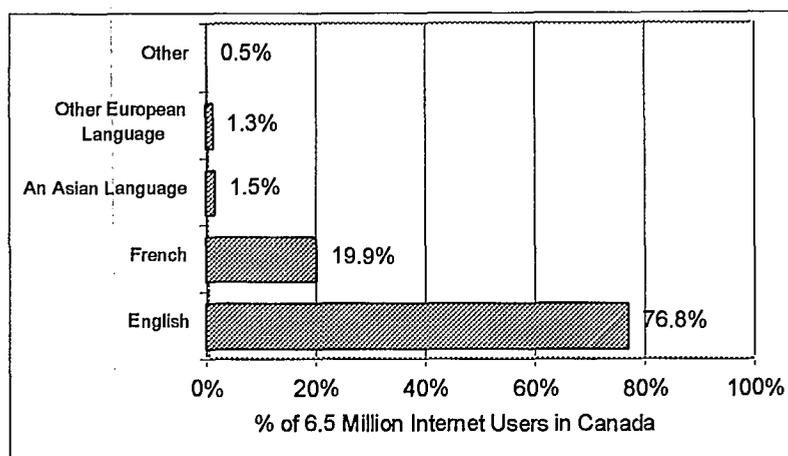
Approximately 77 percent of Internet users in Canada are English-speaking and close to 20 percent are French-speaking. It is interesting to consider this information in the context of the language profile of Canadians. According to Statistics Canada, just over 60 percent of the population is English-speaking.¹⁹ Approximately 25 percent of Canadians list their mother tongue as French and 20 percent speak French at home. So far, study after study has found that the take-up of the Internet is relatively greater for English-speaking Canadians than for French-speaking Canadians.²⁰

¹⁷ See Kahin, Brian and James Keller, *Public Access to the Internet*, 1995.

¹⁸ See Rifkin, Jeremy, *The End of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era*; Block, Fred L., *Postindustrial Possibilities: A Critique of Economic Discourse*; and Reich, Robert B., *The Work of Nations: Preparing Ourselves for 21st Century Capitalism*.

¹⁹ Statistics Canada, *Census of Population by Mother Tongue*, 1991, Catalogue no 93-333.

²⁰ See Nordicity/Nielsen, *Canadian Internet Survey 1995*, January 1996; ACNielsen, *Canadian Internet Survey 1996*, January 1997; Dickinson, Paul and George Sciadas, "Access to the Information Highway", *Analytical Paper Series*, Statistics Canada, - 63F0002-XPB no. 9; and Le Scouarnec, Francois-Pierre, *Strategy and Action Plan for Developing French-language Content on the Information Highway*, December 1996.

Exhibit 3-1: Language Spoken at Home

Source: Nordicity/Nielsen, *Canadian Internet Survey 1995*.

The lack of easily accessible French-language content on the Internet was identified by the Council as an access barrier. The Council stated "To reflect Canada's linguistic duality, the French language must have a prominent presence on the Information Highway. Government policies should stimulate, through appropriate incentives, the creation and production of new content and navigational tools to meet the needs of Canada's French-language market."²¹ To the extent that the Internet is the Information Highway of today, is there is a continuing need for more French language content and for easier ways to access it?

Services such as Sympatico now offer an electronic phone book in English and French listing 10 million business and residential phone numbers. Canadian search engines such as Yahoo Canada offer a list of Canadians sites first. Still, promotion of French language web sites is limited. In a study of the Web sites and electronic mail of 20 government departments, the Office of the Commissioner of Official Languages recently found that one of the biggest problems was the shortage of software to navigate the Internet in French. The Commissioner's report contained

²¹ Information Highway Advisory Council, *Connection Community Content: the Challenge of the Information Highway*, Final Report, September 1995.

22 recommendations, including the need to promote the research and development of bilingual software.²² Should a similar challenge also be issued to private sector access providers?

The Council recognizes that, given the pace of progress, today's trends may not become the realities of tomorrow. People who are not using the Internet today may become avid users. However, to ensure that the Internet develops in a way which ensures access is widely available and affordable, should the government establish a National Access Board? Should the Board serve as an advisor to government or should it have regulatory powers to implement non-market mechanism to complement the market if necessary?

²² Office of the Commissioner of Official Languages, *Special Study, Use of the Internet by Twenty Federal Institutions*, December 1996.

4.0 COMPUTER LITERACY: WHAT SKILLS DO CANADIANS NEED?

Literacy used to mean being able to read and write and the ability to work with numbers. Now it includes the skills to interact with information technology. More than ever, people need the literacy and analytical skills to search for, select and process the information they need. More than ever, the access tools include technology such as computers and information networks such as the Internet.

Some day, accessing the Internet and its web of services will be as easy as picking up the telephone or turning on the TV. In the meantime, people are still getting used to computer technology and learning how to untangle the web. Many Canadians still consider themselves to be Internet beginners and do not feel comfortable with current computer technology.²³

In its 1995 report, the Council sent a message to individual Canadians to “get involved as users of information technology and take charge of our own education and training.”²⁴ As a first step for Canadians, is there is a need to ensure that individuals have access to the training they need to develop computer literacy skills and feel comfortable with technology?

The Council also called upon the government to develop a national access strategy for the Information Highway and the government discussed its plans for such a strategy in *Building the Information Society: Moving Canada into the 21st Century*. The government noted that “most provincial and territorial governments, which have jurisdictional responsibility for education, are developing strategies and programs to introduce the new learning technologies.”²⁵ As Canada designs its national access strategy, there may be opportunities for co-operation among different levels of government to configure these strategies and programs as engines to implement access goals with a focus on community networking and training.

²³ See Insight Canada Research Group, *Public Attitudes Towards Broadcasting and New Technologies*, March 1996.

²⁴ Information Highway Advisory Council, *Connection Community Content: the Challenge of the Information Highway*, Final Report, September 1995.

²⁵ Government of Canada, *Building the Information Society: Moving Canada into the 21st Century*, May 1996.

4.1 INITIATIVES TO DATE

The Office of Learning Technologies (OLT) at Human Resources Development Canada provides support to adult learners to make effective use of a variety of technologies, including the Internet. Industry Canada programs such as SchoolNet will establish Internet connections to Canada's 16,500 schools by 1998. The Community Access Program (CAP), a joint federal/provincial/territorial initiative, provides support to rural communities across Canada for the equipment, connections, and technical training required to set up and operate a public access network. By 1998 more than 1,500 libraries and community institutions will be connected to the Internet. Also, through the Computers for Schools Program, some 20,000 used computers are donated by government and the private sector to schools and libraries across Canada.

Having access to an Internet connection is one thing; acquiring the skills to use computers and access networks is quite another. It may be possible for a national access strategy to address both. In addition to providing a network connection to community sites, should federal, provincial and territorial governments, in partnership with other stakeholders, expand the SchoolNet and CAP models to ensure the added provision of Internet and computer literacy training services in facilities such as libraries? Equally important, training services must be accessible to the more than four million Canadians who have limitations in hearing seeing, moving, speaking or cognition.

In its 1995 report, the Council noted that people are comfortable with libraries and recommended initiatives to expand the role of libraries as community access points. The computer and information management skills of library staff would prove helpful to those who are unfamiliar with computers. Moreover, public library services are developed by and for the particular community which they serve. Some provinces have established models of "basic" services. This includes a core group of services that must be made available free-of-charge. These are defined in legislation. Additional or discretionary services are determined by individual library branches in response to the priorities of their particular community. Are these principles that could be usefully applied to the development of a community networking model for Internet services?

5.0 SERVICES ON THE INTERNET: WHAT DO CANADIANS NEED AND WANT?

The Internet services which Canadians will need and want are likely to change and grow. Today, electronic mail (Email) is the most popular service. In the future, the Internet may become an important source for health services, learning and training, entertainment, cultural expression, electronic commerce, and for public information as the basis for citizen participation in Canadian society and governance.

Web sites such as GlobalMedic provide a database service which features an artificial intelligence engine that emulates a physician's reasoning to conduct diagnoses and respond to health questions. Users accessing the site can undergo a free on-line medical checkup, learn about diseases, browse the latest medical encyclopedias and drug books, and learn more about community health issues. Links are provided to on-line support groups which offer information on health care alternatives, possible drug reactions and other health-related topics.

Health Services

The number and variety of Internet sources for health information grows daily as Canada moves to a health care model in which individuals will assume greater responsibility for their health. Canada's health care system is being reconfigured, reformed and reduced in terms of public funding. The Internet offers a cost effective way to deliver services, sustain an accessible health care system and improve the quality of information and care.

For people living in rural and remote regions of Canada, remote diagnostics can provide specialist support to hospitals and clinics. For doctors and other health professionals, on-line databases and training programs facilitate

ongoing professional development. For individual Canadians, the Internet provides access to timely, user-friendly and affordable information, services and products related to health.

SchoolNet is one of Canada's most prominent Internet-based learning services. Established as a partnership initiative by the public and private sectors two years ago, SchoolNet provides students up to grade 12 with access to on-line encyclopedias, library indices, newspaper data bases and discussion groups on subjects as diverse as Canadian history, sports and media issues. Students and teachers alike have established networks of "pen pals" and mentors from around the world with whom they can share experiences and resources.

Learning and Training

The Internet offers a flexible, efficient tool for widespread, cost-effective delivery of the skills and knowledge essential to a lifelong learning society. Students are already keen users of the Internet for access to course and training information, directories, discussion groups and research. Teachers are using the Internet to upgrade their computer and teaching skills. Trainers are developing computer-based training materials which can be delivered to Canadians as well as to international users. Increasingly students

of all ages will use the Internet for the services they need to continue to learn and retrain throughout their lives.

As part of its Internet Web service, *Chatelaine* magazine provides free access to articles on family matters, highlights of upcoming editions and on-line surveys collecting and reflecting the interests and concerns of Canadian women and families.

Entertainment Services

On-line games, videos, and music are available via the Internet, although most people don't yet have access to the computer equipment or the network capacity that they need to make full use of these services. As technical improvements and price reductions make video and voice

capability more available and affordable, demand will increase for Internet entertainment services which incorporate full-motion video, sound and interactive multimedia elements.

Entertainment services for the Internet represents a growing market for Canada's cultural industries, as well as an opportunity for Canadians to participate in an on-going national cultural dialogue within Canada.

New Media North is a special interest group of the Ottawa Carleton Research Institute, focused on the creation of content, content production technology and the technology of content distribution for emerging stand-alone and broadband networked multimedia. It operates as a community-based partnership and point of convergence for individuals involved in the creative, cultural, content distribution and technology sectors.

Cultural Expression

Canadian culture and the preservation of the values which define us have always been important to Canadians. The Internet offers new possibilities for individual Canadians to interact with each other and with their governments, not only as consumers of new content and services, but as producers as well. In addition to E-mail and participation in chat groups, individual Canadians are creating their own Web sites, developing customized and shareware products and operating as

on-line publishers - without having to access substantial financial or commercial resources. With a market of millions, the Internet might turn out to be an intensely democratic distribution system, enabling access for producers regardless of size, nationality or industry track record.

Companies such as MPACT Immedia Corp. and Systems Xcellence Inc. specialize in software packages designed to enable secure payment transactions across the World Wide Web. Increasingly, these packages will be included as part of the overall operating system for Internet

Electronic Commerce

Businesses and governments are increasingly using on-line transactional services to reach a wider group of customers, improve service and cut costs. The growth in intranets, which are private internal business networks, and more recently extranets, which are business-to-business networks shared by two or more

organizations, suggests a pattern of expanding business use.

Most governments also offer a range of on-line services and maintain Web sites. Last year the federal government completed 600,000 electronic transactions worth \$180 million. Since 1993, 10 million income tax returns have been filed electronically. More than 20,000 documents have been put on-line to business at Industry Canada's Strategis web site. What's more, the government has made a commitment to electronic commerce as its preferred way of doing business by 1998.

A study by Killen & Associates estimates that by 2000²⁶, electronic commerce provided by telecommunications services companies will be a \$98 billion business. That includes \$65 billion in network information services such as credit card authorization and \$22 billion for electronic commerce support services such as intranet setup, training and software.

For individual Canadians, the full potential of electronic commerce via the Internet may not be realized until concerns about privacy and security are addressed. Several studies over the past couple of years found low consumer participation in Internet-based purchases. In its most recent survey of Internet users, Nielsen found that 11 percent of users have made a purchase, up from 7 percent reported last year. Still, users indicated a sense of reluctance. Nielsen went further and asked respondents why they were reluctant to use the Internet for commerce. Approximately 75 percent identified security concerns arising from the transmission of unsecured credit card numbers and other financial information. Only 5 percent of users, including those who have made Internet purchases, have the sense that it is safe and secure to shop on line.

Nielsen also asked Internet users about the measures that would be most effective in increasing on-line commerce. A majority of respondents said they would shop on-line if the secure transmission of credit card or financial information is guaranteed by a large well-known financial institution or credit card company. Next in preference was encryption software followed by an Internet industry code of conduct and government regulation.

Public Information and Citizen Participation

In a knowledge society, access to information technology and public information will be essential to citizen participation in keeping with our democratic traditions. The Internet offers an opportunity to make a far greater range of public and government information available to Canadians and governments are already moving aggressively to do so.

As part of its decision to increase its use of electronic commerce, the federal government has made twin commitments to the provision of universal and equitable access to government services, and to privacy and security of personal information. Volunteer operated freenets and community-based networks have sprung up across the country to provide access points to communications and information services including those provided by governments. While the electronic provision of information and services reduces costs for government, some of the financial burden is shifted to the public access networks that provide these services. As a result, will it soon be necessary to develop measures to compensate public Internet access providers for providing access to these services?

²⁶ See "Turning on the Net", *Telephony Magazine*, November 11, 1996.

The Council considers that citizen participation also involves access to training as well as a minimum level of information resources, or services that should be made widely available. This may include community bulletin boards, electronic polling and voting, government information and other types of content.

6.0 THE INFRASTRUCTURE: WHAT CONSTITUTES AN ADEQUATE NETWORK CONNECTION?

To access the Internet today, you need a computer equipped with a modem, some software, a telephone connection, and access to an Internet Service Provider (ISP). Computers, modems and Internet software are widely available, though a majority of Canadian households don't have a computer.²⁷

The cost of modem-equipped computers with Internet access software is between \$2,000 to \$3,000. The capabilities of the computer, modem and software determine to a large extent what applications can be used, how easy is it to use them and how well they function. Of course, much also depends on the user's skills and knowledge of available resources.

A telephone connection is also widely available at a basic cost of \$20 - \$30 a month and access to an ISP is becoming increasingly available on the basis of a local phone call. Prices for Internet access connections vary according to the amount of bandwidth or capacity that is required and the number of hours for which the service is used. Internet usage charges can be as low as \$20 a month for low capacity service to \$375 a month or more for high capacity service.

Alternative services are provided by a growing number of Freenets and Community Nets which offer free access to the Internet. Most are used to send E-mail to friends or business associates, and access bulletin boards or newsgroups. Freenets are run by volunteers and operate on the basis of contributions – the majority of which come from users.

6.1 RESEARCH AND INNOVATION

As demand for access to the Internet continues to grow, stress on the communications infrastructure is beginning to cause delays and disruption in service. This is because an Internet "telephone call" lasts an average of 20 minutes instead of the three minutes that the telecommunications switches were designed to handle. As a consequence, users have complained about congestion and slow and unreliable service.

²⁷ Statistics Canada, *Household Facilities and Equipment Survey*, October 1996, Catalogue no 64-202-XPB.

A recent announcement by Nortel introduced a new service which promises to eliminate phone line bottlenecks by removing Internet calls from the voice network and placing them on the carrier's data systems which is better able to handle such traffic. In addition, digital technologies which can squeeze more data into telephone or cable lines and send it at higher speeds than what is currently available – are on their way.

The Canadian Network for the Advancement of Research, Industry and Education (CANARIE) has significantly advanced development of switched broadband services and digital technologies such as Integrated Services Digital Networks (ISDN) and Asynchronous Digital Subscriber Lines (ADSL). The pace of Internet development and change continues to surprise: technical work on the next generation of the Internet, and potentially a new constellation of networks, has already begun.

Over the next 10 years, private radio alone is expected to invest \$50 - \$100 million to develop digital radio, which will be compatible with computers and allow for unprecedented customization of services. Unlike radio, there is no new spectrum allocated for digital television. Instead, broadcasters are making use of digital video compression technology to squeeze television signals into the existing bandwidths. Digital television enables broadcasters to transmit studio quality signals without interference or signal degradation and offer customized services to meet individual needs. It also paves the way for the much anticipated high definition television.

Industry Canada and Canada's satellite industry are also co-operating on the early development and commercialization of new satellite-based multimedia services. Canada's Advanced Satcom Initiative is intended to the delivery of these broadband services across Canada by the end of 1999.

Advances like these will facilitate the increasing use of "value-added" Internet services which include voice and video traffic. This includes the provision of specialized keyboards for the physically impaired, voice mail for the blind, and video and captioning services for the deaf. Additionally, for services such as remote health diagnosis and distance learning, high-speed, high capacity connections will be a necessity.

What remains to be achieved, then is the development of friendlier terminals and equipment for Canadians who feel marginalized by the current access technology. In response, equipment providers have already begun work on new kinds of terminals ranging from Internet phones to web television to voice-activated computer systems. For those who require adaptive technologies which modify their work stations to enable access, manufacturers have attempted to eliminate the barriers of technology design. As a result of joint research, the Diversity Management Directorate of the Public Service Commission of Canada and the Adaptive Technology Resource Centre (ATRC) of the Information Commons, University of Toronto now maintain a Web service for

users with disabilities. It includes information on keyboard equivalents for mouse driven applications, and the customization required for effective use of adaptive technology products with particular web browsers.

6.2 INVESTMENT AND INFRASTRUCTURE

Service providers have begun to invest and to compete on the provision of new infrastructure and services. Telephone companies are already competing with ISPs such as iStar and Web Networks to provide Internet access services. The Stentor operating companies also announced investments of \$10 billion over the next 10 years to upgrade local access network facilities as well as regional and national networks. High-speed Internet access services are expected by the middle of 1997 and will be available to 90 percent of business and homes by 2005.

The cable industry launched Vision.com as its initiative to invest \$5 to \$6 billion over the next 5 years to develop personal computer access services, interactive television and advanced telecommunications and telephony services. A consortium of cable companies is now introducing Internet service for a flat-rate fee of \$55 a month . This includes the rental of a cable modem, but not the one-time installation charge of \$150. According to cable estimates, 75 percent of Canada's population will have access to high-speed modems by the end of this year with complete coverage targeted for 1999.

For many of Canada's northern and remote communities, satellite services have made the difference between participation and marginalization and will continue to provide an effective means of addressing access concerns in rural and remote areas, including access to the Internet. Telesat Canada's DirecPC package offers an extensive range of Internet access services and rates from approximately \$19.95 a month for a basic service to \$314.95 a month for higher speed packages. These prices do not include the cost of a satellite dish.

New wireless carriers such as providers of multipoint distribution systems (MDS) service and local multipoint communication systems (LMCS) are now entering the market and are expected to introduce Internet access packages over the next year. LMCS applicants have proposed to invest over \$1 billion and create 8,000 jobs over the next five years.

7.0 A COMMUNITY NETWORKING MODEL FOR INTERNET SERVICES

The Council agreed with government policy that the Information Highway's services will largely be determined by a competitive environment. However, the achievements of competition and innovation may not be enough to provide individual access to the Internet at affordable prices.

The metamorphosis of the Internet has only just begun, and it may be too early to set up a complex support structure to meet the goal of universal access to the Internet. However, if Canada really wants to accelerate the development of its Information Highway and employ the Internet to support its economic, social and cultural goals, it is not too soon to implement a national access strategy that will guarantee Internet connections, training and a basic level of services in public access points in communities across Canada.

There are various ways to approach a community access strategy for the Internet. Last year, in his State of the Union address President Clinton set a goal to connect every classroom and library to the Internet by the year 2000. This year he added every home and every hospital.²⁸

In the United Kingdom, British Telecommunications PLC is investing CDA\$107 million to build Europe's largest network of touch-screen kiosks to bring the Internet to the public. Up to 10,000 Touchpoint kiosks will be placed in locations such as shopping centres, leisure centres, hotels and universities.

What will work best for Canada? What are the roles of government, industry and individual Canadians? In situations where market forces will be insufficient or work too slowly to meet the public interest, the Council's advice to government was to "maintain funding support for shared public networks such as community, school and library nets and common-user access centres."²⁹

SchoolNet, the Community Access Program, CANARIE and Industry Canada's Assistive Devices Industry Office are impressive testimonials of Canada's early action in this area. These programs

²⁸ President Clinton, *We Must Be Shapers of Events, Not Observers*, State of the Union Address, February 4, 1997.

²⁹ Information Highway Advisory Council, *Connection Community Content: the Challenge of the Information Highway*, September 1995.

have a continuing role as critical success factors. The government also has a vital role to set a clear policy and regulatory framework to establish equitable access for Canadians to Internet services, both as users and as providers of content and services.

The goal of affordable public access to the Internet cannot be realized without the active participation of the private sector. Many companies donate computer equipment, services and training to schools, libraries and community institutions. Some also offer dedicated access channels for educational and community-based services. Continuing commitment, particularly in the areas of training and access for persons with special needs, must be encouraged.

Individual Canadians are also getting involved as freenet volunteers and fund-raisers for community networks as a vehicle for local expression. Much like the community television channel service which makes channel and studio facilities available in most communities, the Internet offers a new medium by which the goals of citizen participation and community involvement may be achieved.

7.1 COMMUNITY NETWORKING: THE CENTREPIECE OF A NATIONAL ACCESS POLICY

The Council has developed recommendations to establish a community networking strategy as a central pillar of Canada's national access strategy. Several strong proposals for a community networking model to access the Information Highway have emerged. The Public Interest Advocacy Centre (PIAC) has advanced the concept of a public space community networking service.

The goal is for communities in geographic regions across Canada to create and communicate their own information, among each other and with communities around the world. The model is for public participation and interaction among individuals, not-for profit organizations and institutions, governments and their agencies, and community groups. This networking service could be delivered by the Internet but not necessarily. Decisions on the technology and services to be offered would be made by individual communities and the operation of the network would be governed by non-profit organizations at the local level. The model also identifies a need for sustained support for shared public access networks. Such support could be provided by community members, service providers, by governments or all three.

Some service providers have developed more commercial visions for community networking services which are based on models for the extension of existing services provided by telephone, cable or satellite companies. Among these, is a plan to expand the community channel service to include interactive networking services, direct investment in the development of multimedia content, including French-language content for community-based Internet services, and the

commercial operation of freenets and other types of integrated networks. While many of these concepts are under review by the CRTC, the Council's Steering Committee on Access has expressed the view that regulation in this area should be based on a national access strategy which clearly articulates the role of community networks in providing access to the Internet.

Specifically, the Committee notes that a community networking strategy for access to the Internet will significantly contribute to the goal of highlighting local creative expression and citizen participation within communities across Canada. In addition, a new dimension of community can be created, as individuals reach out and share ideas and interests with people around the corner and around the globe.

8.0 THE ISSUES OF ACCESS

This paper is a contribution to the discussion on access to the Internet in the context of the government's plans for a national access strategy for the Information Highway. It is intended to encourage an exchange of views among Canadians, not to provide definitive conclusions. We know that participation in the information society is important to Canadians. In order to ensure that the benefits of participation don't stop at the doorsteps of the early technology adopters, we need to address the questions of access through open and informed debate on the issues of access as follows:

Computer Literacy Skills: What kinds of computer skills do Canadians need to access the Internet? Should government now make it a priority to provide learning and training opportunities for Canadians to develop computer literacy skills? If, so, what kinds of computer skills do Canadians need?

Services: What kinds of Internet content and services are, or will be important to Canadians? What should be available to every Canadian? How can we ensure that these services are available at just and reasonable rates?

Network Connections: What kinds of physical access connections to the Internet will we need to ensure that all Canadians have the opportunity to access the Internet?

A Community Networking Strategy for the Internet: Do we need a strategy to ensure community-based access to the Internet? What will work best for Canada? What are the roles of government, industry and the public?