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Formative Evaluation of the Broadband for Rural & Northern Development Pilot

FINAL REPORT

July 2006

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Industry Canada

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**Tabled and approved by DAEC
on April 23, 2007**

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Cat. No. Iu4-111/2007E-PDF

ISBN 978-0-662-46026-8

60243

Aussi offert en français sous le titre *Évaluation formative du Programme pilote sur les services à large bande pour le développement rural et du Nord*

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Minor editorial changes were made to this report in order to prepare the document for posting to the Industry Canada’s Website (including removal of standard Appendices such as list of interviewees and questionnaires). Readers wishing to receive a copy of the original version of this report should contact the Audit and Evaluation Branch at Industry Canada.

Executive Summary

Background

The federal government is mandated (under paragraphs 7(a) and (b) of the Telecommunications Act) to:

- “facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions” and,
- “render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada”.

With this mandate, and subsequent interventions, the government has ensured affordable and reliable basic telephone services in all areas of the country. Broadband (high speed Internet) infrastructure, the next step in telecommunication services, can enable communities to utilize information and communication technologies (ICT) to attain a wide array of economic, social and cultural benefits. These include, for example, enhanced health care through tele-medicine, greater access to education opportunities through e-learning, and improved access to more markets by small- and medium-sized businesses through e-commerce. Market forces alone will not extend the benefits of broadband access to some communities. In 2001, there were 5,426 communities across Canada, of which 4,206 communities, or approximately 77 percent did not have access to broadband (deemed “unserved”). Most of these unserved communities are located in northern, rural and remote Canada, and approximately 10 percent are First Nations, Inuit and Métis communities. These communities risk falling behind their urban counterparts in their ability to harness the potential of broadband, and in doing so, take full advantage of the economic and social opportunities these powerful networks have to offer.

The Broadband for Rural and Northern Development Pilot Program (Broadband Pilot Program) was launched in September 2002 as a three-year \$105 million initiative with a matching capital cost structure, to address this (broadband) gap between served and unserved communities. In 2004, the Broadband Pilot Program received Treasury Board approval to extend its policy mandate and reprofile a portion of its funding to 2007 (while not exceeding the overall \$105 million allocation).

Hickling Arthurs Low (HAL) Corporation was engaged by Industry Canada to undertake a formative evaluation of the Broadband Pilot Program. The evaluation was guided by a Steering Committee.

Program Profile

Mission

The Broadband Pilot Program has been created to:

- Support the deployment of broadband to unserved communities in order to demonstrate the economic, social and cultural benefits of broadband, and
- Improve the participation of these communities in the national and global economy.

Priority is given to First Nations, Inuit and Métis, northern, rural and remote communities.

Objectives

The objectives of the Program are to:

- Demonstrate and validate the benefits of broadband in unleashing the full innovative potential of communities across Canada;
- Provide funding to unserved communities to prepare business plans that detail the need for broadband services in their communities;
- Provide funding to unserved communities to help them implement broadband services that will address the needs of these communities in the areas of job creation, education, health, economic development, and governance;
- Create opportunities for learning by sharing best practices among communities; and
- Create new business opportunities, domestically and globally, for Canadian ICT companies.

Selection Process

The Program was delivered by Industry Canada in two competitive rounds. In each round, there were two types of funding available: phase 1 provided funding for the development of broadband business plans (up to \$30,000 or 50 percent of eligible costs, whichever is less), and; phase 2 funding was made available (up to 50 percent of eligible costs) to assist in the implementation of broadband business plans (build the broadband infrastructure).

A National Selection Committee (NSC) was responsible for reviewing all submissions (phases 1 and 2 of both rounds) and, with input from Industry Canada, other government departments/agencies and provincial and territorial representatives, making recommendations to the Minister of Industry for approval. Industry Canada regional representatives were engaged to assist in the delivery of the program at the local level. Their responsibilities included: promotion of the pilot program, liaising with communities, potential applicants and recipients; assisting in the competition process by collecting input on submissions from Regional Development Agencies, other government agencies as well as from provincial and territorial governments. Results to date have been as follows:

- Under the two rounds of business plan development funding, 154 projects, representing approximately 2,285 communities, were selected to develop business plans that outlined their vision for the application of high-capacity Internet services. In total, \$4.2 M was invested in the development of these plans.
- Under the two rounds of business plan implementation funding, 63 projects, representing nearly 900 communities (including 142 First Nations reserves), were selected to receive a one-time investment in capital infrastructure. In total, \$80.3 M was invested in the implementation of broadband business plans.

The following table shows the distribution of Broadband Pilot Program implementation funding projects, the number of communities involved, the number of First Nation Reserves involved, amount of funds requested from the Broadband Pilot Program, and the total investment, as of February 2006.

Province/ Territory	Number of Projects	Number of Communities	Number of FN Reserves	Amount Requested	Total Project Costs
NL	11	96	0	\$10,653,762	\$22,315,112
PE	5	26	2	\$3,053,442	\$6,790,933
NS	7	58	4	\$7,575,176	\$15,818,881
NB	0	0	0	0	0
QC	8	226	9	\$18,184,985	\$42,029,807
ON	9	106	20	\$7,636,622	\$18,266,334
MB	5	117	25	\$6,767,091	\$14,169,699
SK	4	96	34	\$7,430,850	\$18,750,476
AB	1	11	6	\$318,440	\$636,880
BC	10	101	41	\$9,616,963	\$22,088,108
NU	1	24	0	\$3,885,000	\$8,712,622
NT	1	29	1	\$5,368,318	\$10,232,318
YT	1	6	0	\$222,806	\$470,090
Total	63	896	142	\$80,695,622	\$180,281,260

Study Purpose

The purpose of the study is to prepare an interim evaluation. The Results based Management Accountability Framework (RMAF) for the Program sets out three primary issue areas for the evaluation, each with a number of evaluation questions:

Relevance – Does the Broadband Pilot Program continue to be consistent with departmental and government-wide priorities, and does it address an actual need?

Success – How have Canadians benefited from the achievements (both intended and unintended) of the Broadband Pilot Program? To what extent do the activities of the Broadband Pilot Program contribute to the realization of Industry Canada’s Connectedness and Innovation goals?

Effectiveness and Efficiency – Are the most appropriate and efficient means being used to achieve the Broadband Pilot Program’s objectives, relative to alternative program design and delivery approaches?

Study Approach

The study approach involved three lines of enquiry: document review, 48 consultations, and a survey of project representatives. Primary data collection was obtained from five groups of respondents as outlined in Table I.

Table I: Profile of all Respondents

Respondent Group	Interviews	Survey
Project Representatives (community champions, project managers)	✓	✓
Business Partners (vendors, ISPs)	✓	
Broadband Users from Broadband Pilot Program Projects	✓	
Broadband Pilot Program Staff & NSC Members	✓	
Unserved Communities (project representatives from unsuccessful phase 2 proposals (implementation/build the infrastructure), and community representatives who decided not to submit a proposal (phase 1 or 2) to the Broadband Pilot Program)	✓	

When the consultations and the survey with project representatives (community champions, project managers) are combined, 54% (32 of the 59) initial Broadband Pilot Program projects¹ participated in the study. This represents 527 communities (or 60% of the communities covered by the Broadband Pilot Program), of which 79 are First Nations communities (or 68% of the First Nations communities covered by the Broadband Pilot Program).

The number of Broadband Pilot Program communities whose representatives participated in the study is provided in Figure I, and the percentage of Broadband Pilot Program communities is provided below in Figure II. It is important to note that because of comparable provincial and Canada Strategic Infrastructure Fund (CSIF) programs, there were no Broadband Pilot Program projects in New Brunswick and only one Broadband Pilot Program project in Alberta. There was one Broadband Pilot Program project in each of the three territories, but none of them participated in the evaluation.

¹ Four additional projects were supported by the BRAND Pilot Program after the start of the evaluation study, bringing the total number of projects supported by the Program to 63.

Figure I: Number of Communities Whose Representatives Participated in the Study

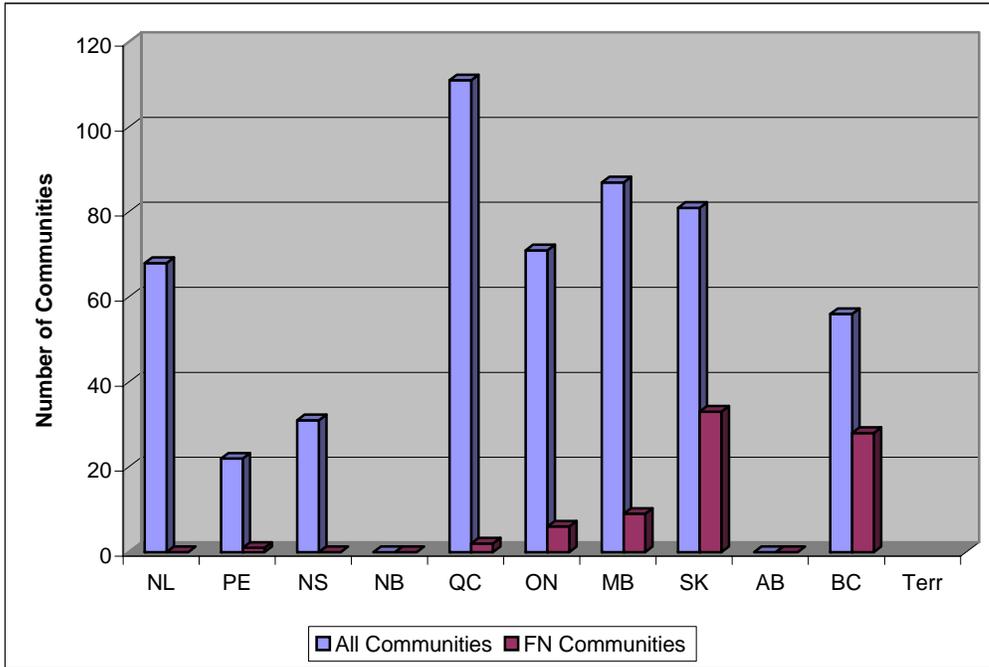
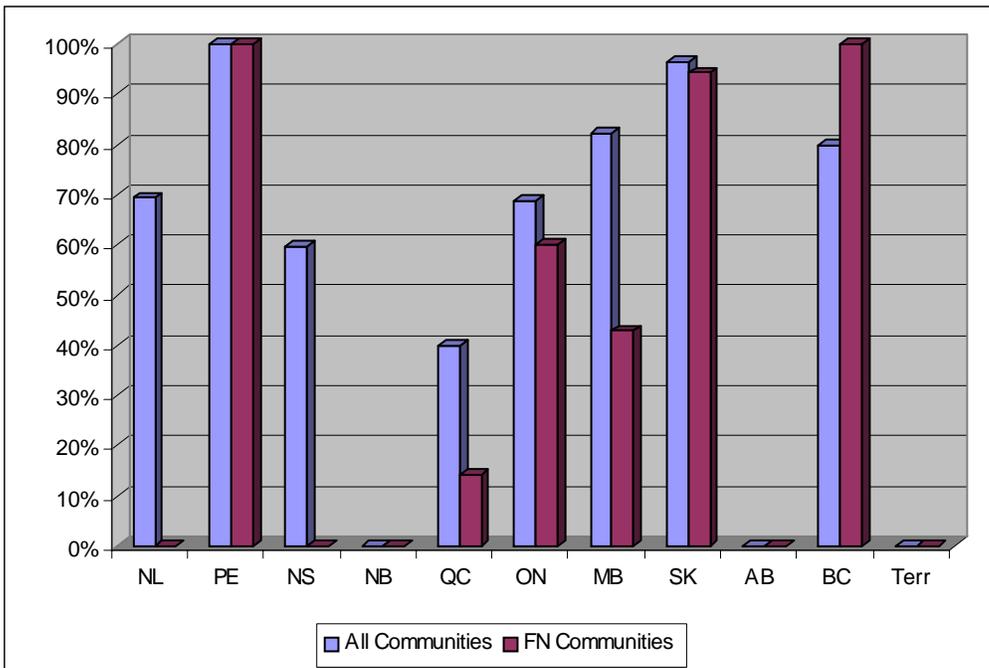


Figure II: Percentage of Communities Participating in the Study



Findings

Relevance

Does the Broadband Pilot Program continue to be consistent with departmental and government-wide priorities and does it address an actual need?

Broadband has become a necessary infrastructure that Canadians rely on in order to participate in today's economy, and it is considered to be "very important" by all users consulted by the study, and by over 90% of project representatives and business partners. Broadband is essential today, whether it's a major urban centre like Toronto or a remote community in Nunavut. It helps to level the playing field with urban/southern communities. Broadband services have the potential to greatly enhance the lives of Canadians – both those in cities or in urban, rural and Aboriginal communities – whether through more learning and cultural opportunities, better access to improved health care or enhanced economic opportunities. A broadband user summed up the effect of having broadband on his community very eloquently by noting that, "as it relates to social and economic development within (our region), broadband is an important tool that enables us to take a proactive approach in moving the agenda forward enhancing economic development initiatives and fostering social stability. In education, for example, individuals have easier access to home based training. In health, doctors and nurses can easily and effectively communicate with counterparts, ensuring quick collaboration that may save lives. Any group or organization with the introduction of broadband has easier access to information, government programs, research options that permits easier development of initiatives that can benefit a region socially and economically." Not surprisingly, 90% of communities, and 70% of First Nations communities see a continuing need and a priority to invest in broadband.

Ninety-three percent of vendors and ninety-four percent of project representatives indicated that without government assistance there is simply no business case for providing broadband services to rural and remote communities. If left to the market, only the most populated areas would be connected. Some vendors indicated that in theory, a few communities might have been provided with broadband in 2-3 years provided that costs declined along with technological advances. But, for most rural and remote communities, they would never get access to broadband services even in the near term without some support from government. The Broadband Pilot Program has filled a void that based on evidence gathered for this study, would not otherwise be addressed by the private sector in a timely manner.

Success: Objectives Achievement

To what extent do the activities of the Broadband Pilot Program contribute to the realization of Industry Canada's Connectedness and Innovation goals; first, to make Canada the most connected country in the world? And second, to improve Canada's innovation performance?

Although the number of communities yet to be served by broadband has been reduced from 4,000 to 2,000 communities, Canada's international leadership position vis-à-vis broadband penetration has been in sharp decline: Canada fell to eighth place in the OECD's December 2005 broadband ranking, from 4th place in 2004 after being second to only Korea since 2001. Thus,

Broadband Pilot Program investments have not been enough to ensure and maintain progress in making Canada the most connected country in the world. When compared to the G7 countries, however, Canada has consistently ranked first in terms of the number of broadband subscribers per 100 inhabitants.

Although it is too early to tell if innovation performance has improved in the Broadband Pilot Program communities, the Program is one of a series of complementary programs designed to improve Canada's innovation performance.

Success: Impacts and Effects

How have Canadians benefited from the achievements (both intended and unintended) of the Broadband Pilot Program?

Virtually all of the users and project representatives consulted by the study indicated that the overall impact of broadband on their community has been "positive" or "very positive". The benefits of broadband cover all sectors:

- **Economic:** broadband networks help build a 21st century economy by innovating and creating new jobs in every economic sector, by providing opportunities for skills development, and by achieving environmentally-friendly sustainable development.
- **Business:** existing businesses deciding to remain in the community and/or expanding their operations, new businesses locating in the community.
- **Government:** being able to access and download information on government programs and services, completing and filing forms online.
- **Health:** particularly the avoided time and cost of traveling for medical consultations and/or follow-up, having broadband helps to retain health professionals in the community, without broadband health professionals are less likely to locate in the community.
- **Education:** particularly distance education, conducting research over the Internet, youth being able to stay at home and in their community to complete high school, completing college/university courses/degrees and/or taking job skills training from their community as opposed to living away from home.
- **Social:** community access and removing the sense of isolation, being able to keep in touch with family and friends, for young people (the "myspace" generation²) being able to socialize with their peers in virtual community centres.

The majority of project representatives indicated that the Broadband Pilot Program, notably community consultations and the process of developing the business plans, helped communities to identify their Information and Communication Technologies (ICT) needs and created an awareness of the potential uses and benefits of broadband. The Program also encouraged over two-thirds of project representatives to collaborate, both within and amongst communities, and to

² Jessi Hempel, "The MySpace Generation: They Live Online, They Buy Online, They Play Online, Their Power Is Growing", Business Week, December 12, 2005, pp. 86-96.

share experiences and best practices. The combination of these activities pushed demand up for broadband beyond what many vendors and ISPs had originally expected. Many communities also experienced some positive social and economic benefits, such as described above, early on. The result is that all users consulted by the study intend to continue subscribing to broadband in the foreseeable future.

Broadband has been extended to more communities than expected. The Broadband Pilot Program reached/provided broadband service to 896 communities, or over twice the original expectation of 400 communities. There were two reasons for this:

- Many projects ended up including communities outside the “project area”, or jurisdiction in the case of community futures development corporations. When other communities learned that their neighbours were applying to the Broadband Pilot Program, they wanted to be included. A partnership was created and a joint proposal developed that included communities from both regions/jurisdictions, rather than developing separate proposals.
- Some vendors included more communities due to the nature of the technology. As one vendor explained, the way their network runs, in some cases they have to connect community A in order to reach community B. If community B was the project applicant, then community A was connected as a result of community B’s project.

Program Delivery

Are the most appropriate and efficient means being used to achieve the Broadband Pilot Program’s objectives, relative to alternative program design and delivery approaches?

The Broadband Pilot Program, particularly the financial subsidy provided by government, is considered to be an appropriate way for rural and remote communities to get broadband services. While half of the study’s respondents considered the design and delivery of the Broadband Pilot Program to be effective and efficient, the other half reported it ineffective and inefficient. The various challenges reported to affect efficiency include: availability of matching funds, sustainability criteria, having a sufficient cash flow to undertake project related activities while the environmental assessment is being conducted (Broadband Pilot Program funds cannot be disbursed until the environmental assessment has been completed), lack of community technical expertise (which for example required the use of consultants for developing the business plan), and the additional administrative and reporting burden placed on not for profit organizations, where resources are often stretched.

Conclusions and Recommendations

Extend Broadband to Unserved Communities

Most vendors and project representatives indicated that without government assistance there is simply no business case for providing broadband services to rural and remote communities. Some vendors commented that in theory, a few communities might have been provided with broadband in 2-3 years assuming that costs would continue to decline along with technological advances, but by that time, the gap between rural/northern and urban/southern communities (which have access to broadband) would be wider.

We conclude that the Broadband Pilot Program addressed a need that would most likely not have been provided if left to market forces. Furthermore, there are initial indications of positive social and economic impacts in the approximately 900 communities supported by the Broadband Pilot Program.

However, an estimated 2,000 communities still do not have access to broadband. We recommend, therefore, that consideration be given to extending access to broadband services to a greater number of Canadian communities.

Establish Committee to Coordinate all Broadband Initiatives

Two events within the last few weeks may affect how Industry Canada acts upon the recommendation to extend access to broadband services to all Canadian communities. First, on February 16, 2006 the Canadian Radio-television and Telecommunications Commission (CRTC) determined that initiatives 1) to expand broadband services to rural and remote communities and 2) to improve accessibility to telecommunications services for persons with disabilities would be appropriate uses of deferral account funds (approximately \$650 million) of incumbent local exchange carriers.³ Second, in mid-March 2006, the Telecommunications Policy Review Panel released its final report recommending that “the federal government should reaffirm its commitment to maintaining Canada’s global leadership and to ensuring that broadband access is available everywhere in the country”⁴. As such, a number of the Panel’s recommendations are relevant to this evaluation:

- Recommendation 8-1 (b): the federal government should immediately commence a program to ensure that all affordable and reliable broadband services are available in all regions of Canada, including urban, rural and remote areas, by 2010 at the latest.
- Recommendation 8-3 (b): federal government policy should recognize that market forces will not on their own achieve the policy objectives of deploying ubiquitous broadband access by 2010, particularly in rural and remote areas.

³ CRTC, Telecom Decision CRTC 2006-9: Disposition of Funds in the Deferral Accounts, Reference: 8678-C12-200402313 and 8678-B2-200318049.

⁴ Telecommunications Policy Review Panel, Final Report, March 2006.

- Recommendation 8-4: a specific, targeted government subsidy program, the Ubiquitous Canadian Access Network/Ubiquité Canada or U-CAN program, should be established to ensure broadband access is made available to Canadians in areas where commercial operators are not providing service and are unlikely to do so for economic reasons.
- Recommendation 8-5: The U-CAN program should aim to complete the job begun by the Broadband Pilot Program of providing ubiquitous broadband throughout all regions in Canada that the market is not likely to serve on its own by 2010.
- Recommendation 8-7: The U-CAN program should be flexibly designed and implemented to reflect the needs of stakeholders in regions to be served, including governments, communities and the private sector.

This evaluation concurs with the overall goal and spirit of the Panel's recommendations to provide affordable and reliable broadband services in all regions of Canada. *We therefore, recommend that Industry Canada establish and undertake a horizontal governance function in order to coordinate all initiatives – federal, provincial, and private sector (e.g., funds from the deferral accounts) – in order to avoid duplication of efforts, and to ensure that a greater number of Canadian communities are provided with access to affordable and reliable broadband services.*

Issues to Consider in Future Broadband Initiatives

Bottom Up Versus Top Down

It is interesting to note that over half the business partners (vendors, ISPs) indicated that the rate of deployment of broadband facilities was above or significantly above their expectations. There are several reasons for this. First, two-thirds of project representatives indicated that the Broadband Pilot Program contributed to greater collaboration amongst and within communities. This included the sharing of experiences and best practices. Second, many communities collaborated and submitted joint rather than separate proposals, which resulted in the Broadband Pilot Program supporting twice as many communities as originally expected; i.e., almost 900 communities as opposed to the original expectation of 400. Third, many communities realized positive social and economic benefits early on. Fourth, the capacity to use broadband enabled applications and services, such as distance education and electronic commerce (online business transactions), has increased. This has had a domino effect of increasing awareness of the benefits of broadband, which further increased the use of, and reliance on, broadband. We conclude that the bottom-up approach of the Broadband Pilot Program was the primary factor in the actual demand for broadband exceeding vendor's original expectations.

Although a top down approach provides some ease in administration, *we recommend that Industry Canada maintain a bottom-up approach in any future broadband initiative undertaken by the Department, in order to more fully realize the social and economic benefits of using broadband.* Where broadband initiatives are not the responsibility of Industry Canada, e.g., funds from the deferral accounts, *we recommend that the Department undertake best efforts to ensure that local needs are taken into consideration, such as creating a local advisory committee to the vendors.*

Matching Funds and Sustainability

Several factors were examined pertaining to the implementation/delivery of the Broadband Pilot Program. Providing matching funds and meeting the sustainability criteria was a challenge for roughly 40% of the communities; of which 10% (or one-quarter of the 40%) of communities expect to continue experiencing difficulties in sustaining broadband services. A greater proportion of First Nations communities found the matching funds and sustainability requirements to be a challenge. While there are clearly benefits from broadband, the difficulty with subsidizing O&M costs is the ongoing commitment (e.g., no end date), whereas subsidies on capital costs can be provided over a fixed period of time (e.g., specific end date).

With respect to matching funds, which represents a subsidy on capital costs, *we recommend that, on a case-by-case basis, Industry Canada consider decreasing the amount of funds that communities have to match on any future broadband initiative undertaken by the Department; i.e., Industry Canada should increase the amount of subsidy on capital costs.*

With respect to sustainability, which would represent a subsidy on O&M costs, *we recommend that Industry Canada continue with its policy of only subsidizing capital costs, i.e., Industry should not subsidize O&M costs on any broadband initiative undertaken by the Department.*

1.0 Introduction

1.1 Background

The federal government is mandated (under paragraphs 7(a) and (b) of the Telecommunications Act) to:

- “facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions” and,
- “render reliable and affordable telecommunications services of high quality accessible to Canadians in both urban and rural areas in all regions of Canada”.

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Hickling Arthurs Low (HAL) Corporation was engaged by Industry Canada to undertake a formative evaluation of the Broadband Pilot Program. The evaluation was guided by a Steering Committee whose membership is shown in Appendix A.

1.2 Study Purpose

The purpose of the study is to prepare an interim evaluation. The Results based Management Accountability Framework (RMAF) for the Program sets out three primary issue areas for the evaluation, each with a number of evaluation questions:

Relevance – Does the Broadband Pilot Program continue to be consistent with departmental and government-wide priorities, and does it address an actual need?

Success – How have Canadians benefited from the achievements (both intended and unintended) of the Broadband Pilot Program? To what extent do the activities of the Broadband Pilot Program contribute to the realization of Industry Canada’s Connectedness and Innovation goals?

Effectiveness and Efficiency – Are the most appropriate and efficient means being used to achieve the Broadband Pilot Program’s objectives, relative to alternative program design and delivery approaches?

The 26 evaluation questions outlined in the RMAF are provided in Appendix B. The focus of the study is on validating the principles behind the Broadband Pilot Program, examining the Program delivery process, the partnerships generated and the impact of those partnerships, and identifying the lessons learned from the Program.

1.3 Study Approach

The study approach involved three lines of enquiry: document review, consultations, and a survey.

Document Review

Files of 15 completed projects were examined including applications, business plans, contribution agreements, milestone reports and the final report. We also reviewed websites of individual communities and the Broadband Pilot Program website, as well as other articles and documents relating to the pilot program, including case studies of the economic impact of broadband on four communities, two of which were Broadband Pilot Program projects and two were not. Particular attention was given to the final reports of 15 projects that had been completed as of November 2, 2005. Selected references are provided in Appendix D.

Consultations

Forty-eight interviews were conducted with representatives of selected completed projects (community champions⁵, project managers), business partners (vendors, ISPs) of selected projects, users of completed projects, program staff, NSC (National Selection Committee) members, and representatives of communities whose business plan (building the infrastructure) was not approved (referred to in this study as “unserved”), as outlined in Table 1-1.

⁵ Throughout this report, the terms “community champions” and “project representatives” are used interchangeably, and are treated as being the same.

Table 1-1: Profile of Interviewees

Interview Groups	Number of Interviews Planned	Number of Respondents Contacted	Number of Interviews Completed
Completed Projects (community champions, project managers)	12	14	11
Business Partners (vendors, ISPs)	16	16	12
Users of Completed Projects	18	18	13
Broadband Pilot Program Staff	3	3	3
NSC Members	1	1	1
Unserved Communities (includes representative of one community that did not submit a proposal to the Broadband Pilot Program)	3	9	8
Total	53	58	48

Interviews in Ottawa were conducted in-person and those outside the Ottawa area were completed by telephone. The consultations were semi-structured, allowing for effective probing of issues. Our approach was to solicit participation, arrange a convenient time, forward a consultation guide, and then conduct the consultation. Each interview group was administered a different set of evaluation questions appropriate to them; for example, consultations with users focused on impacts, business partner interviews focused on the business case of broadband, while representatives of completed projects included most of the evaluation questions in the RMAF, as outlined in Appendix B. A notification letter was sent to representatives of all projects by the Broadband Pilot Program inviting them to participate in the study.

Each of the interview questions had two parts: the first part asked respondents for their level of agreement with a statement on a scale of 1 (strongly disagree) to 5 (strongly agree). The second part explored respondent's views in greater (more qualitative) detail. The first part of the community champions' interview questions were the same as some of the questions in the survey of community champions, to allow for comparisons to be made between the qualitative interview data and the quantitative survey data.

Survey

A survey was administered to representatives of completed and ongoing projects; those that were interviewed were excluded from the survey. The survey was web-based, and included a similar set of evaluation questions covered in the consultations. A notification of the survey was distributed by an email message containing a direct link to HAL's web page where the participant completed and submitted their survey response. There was a 52% response rate to the survey as outlined in Table 1-2.

Table 1-2: Profile of Survey Respondents

Survey Response Breakdown	Total
Original Number of Respondents	45
Bad Email Addresses	3
Declined to Respond (ongoing project, too early in process)	2
Number of Valid Email Addresses (respondents)	40
Number of Responses	21
Response Rate	52%

1.4 Respondent Profile

Primary data collection was obtained from five groups of respondents as outlined in Table 1-3.

Table 1-3: Profile of all Respondents

Respondent Group	Interviews	Survey
Project Representatives (community champions, project managers)	✓	✓
Business Partners (vendors, ISPs)	✓	
Broadband Users from Broadband Pilot Program Projects	✓	
Broadband Pilot Program Staff & NSC Members	✓	
Unserved Communities (project representatives from unsuccessful phase 2 proposals (implementation/build the infrastructure), and community representatives who decided not to submit a proposal to the Broadband Pilot Program (phase 1 or 2))	✓	

When the consultations and the survey with project representatives (community champions, project managers) are combined, 54% (32 of the 59) initial Broadband Pilot Program projects⁶ participated in the study. This represents 527 communities (or 60% of the communities covered by the Broadband Pilot Program), of which 79 are First Nations communities (or 68% of the First Nations communities covered by the Broadband Pilot Program).

The number of Broadband Pilot Program communities whose representatives participated in the study is provided in Figure 1-1, and the percentage of Broadband Pilot Program communities is provided below in Figure 1-2. It is important to note that because of comparable provincial and Canada Strategic Infrastructure Fund (CSIF) programs, there were no Broadband Pilot Program projects in New Brunswick and only one Broadband Pilot Program project in Alberta. There was

⁶ Four additional projects were supported by the BRAND Pilot Program after the start of the evaluation study, bringing the total number of projects supported by the Program to 63.

one Broadband Pilot Program project in each of the three territories, but none of them participated in the evaluation.

Figure 1-1: Number of Communities Whose Representatives Participated in the Study

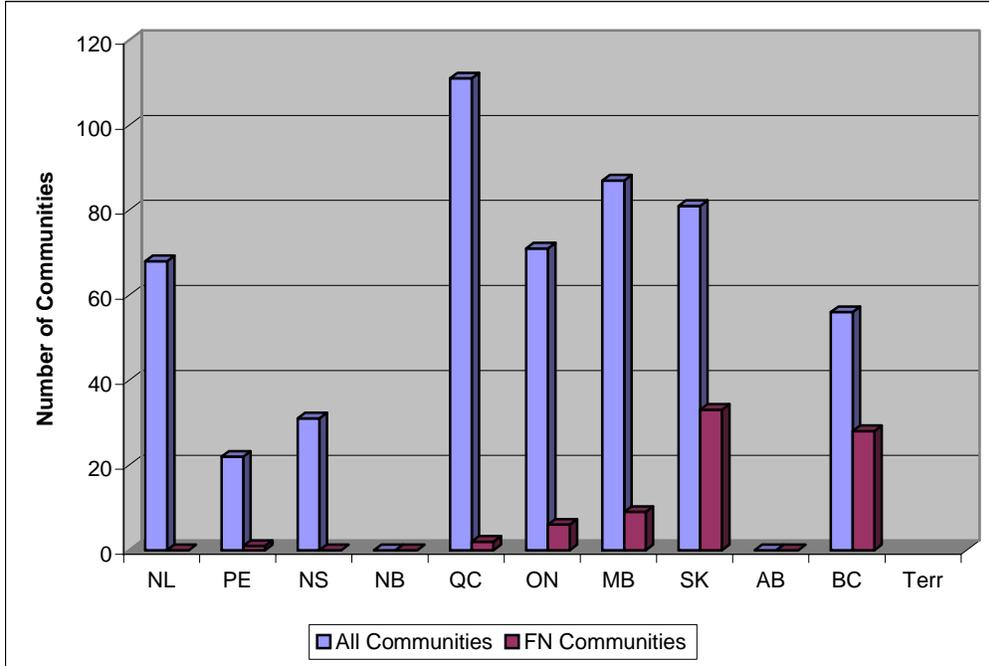
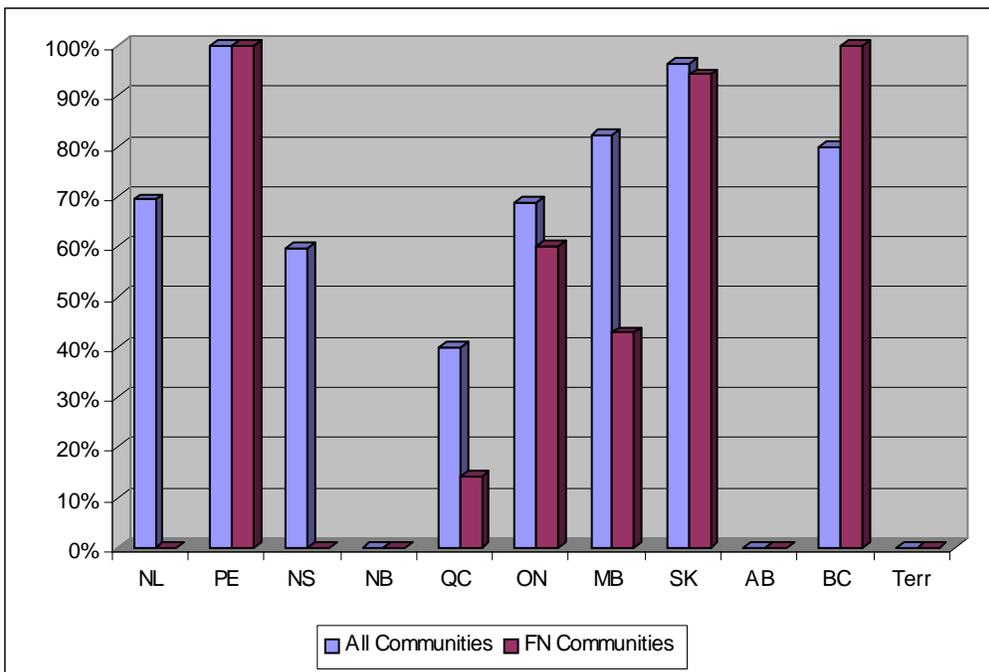


Figure 1-2: Percentage of Communities Participating in the Study



It is important to note that community champion interviews were conducted with representatives of completed projects, whereas the community champion survey was administered primarily to representatives of ongoing projects.

1.5 Study Limitations

The study was constrained by two major factors, difficulties in compiling samples and time constraints, as follows.

Difficulties in compiling a sample (e.g., names, email addresses) of some survey groups:

- The original intention was to interview 30 people (comprised of 12 project representatives, 6 business partners, 5 users, 3 program staff, 1 NSC member, and 3 unserved communities) and administer three surveys (consisting of a survey of project representatives, survey of business partners, and a survey of users). The user survey would provide the input to an analysis of the economic impacts of the Broadband Pilot Program.
- The Broadband Pilot Program database only contains contact information (e.g., names, phone, email addresses) of project representatives. The database does not include contact information of business partners and users of broadband. This meant relying on project representatives to provide contact information for business partners, and relying on the business partners to provide contact information for broadband users. For the broadband user survey, it meant that ISPs would either: a) provide us with a list of users (i.e., their customers) along with their email addresses, or b) agree to administer the survey on our behalf.
- Concerns and discussions regarding the Privacy Act caused a delay in data collection activities. To avoid any chance of contravening the Privacy Act, it was decided not to approach the business partners to assist with the user survey. Instead community champions would be asked to suggest a number of users from their communities. As the number of users would be small, the survey would be dropped and users would be interviewed instead. The number of consultations with users would be increased to 18 (consisting of 3 users from 6 projects).
- As the number of business partners mid-way through the data collection was small, i.e., contact information for only 16 business partners had been obtained, it was decided to drop the business partner survey, and interview them instead.

Time constraints to complete data collection activities:

- As noted above, the number of completed interviews with business partners and broadband users is lower than planned. There were delays in launching the project representative survey, as described above, and more time was needed for project representatives to provide contact information of business partners and users. Most of the respondents to the community champion survey represented ongoing projects. Many asked for the survey to be kept open for a longer period of time, as they wanted to complete their project (their build) prior to responding to the survey, which caused additional delays in receiving completing surveys. Many community champions did provide contact information of business partners and users,

but by that time the information was received it was past the March 10, 2006 deadline. At this time, data collection activity (survey and consultations) was closed so that analysis and reporting could not be undertaken.

2.0 Program Profile

2.1 Mission

The Broadband Pilot Program has been created to:

- Support the deployment of broadband to unserved communities in order to demonstrate the economic, social and cultural benefits of broadband, and
- Improve the participation of these communities in the national and global economy.

Priority is given to First Nations, Inuit and Métis, northern, rural and remote communities.

2.2 Objectives

The objectives of the Program are to:

- Demonstrate and validate the benefits of broadband in unleashing the full innovative potential of communities across Canada;
- Provide funding to unserved communities to prepare business plans that detail the need for broadband services in their communities;
- Provide funding to unserved communities to help them implement broadband services that will address the needs of these communities in the areas of job creation, education, health, economic development, and governance;
- Create opportunities for learning by sharing best practices among communities; and
- Create new business opportunities, domestically and globally, for Canadian ICT companies.

2.3 Selection Process

The Program was delivered by Industry Canada in two competitive rounds. In each round, there were two types of funding available: phase 1 provided funding for the development of broadband business plans (up to \$30,000 or 50 percent of eligible costs, whichever is less), and; phase 2 funding was made available (up to 50 percent of eligible costs) to assist in the implementation of broadband business plans (build the broadband infrastructure).

A National Selection Committee (NSC) was responsible for reviewing all submissions (phases 1 and 2 of both rounds) and, with input from Industry Canada, other government departments/agencies and provincial and territorial representatives, making recommendations to the Minister of Industry for approval. Members of the National Selection Committee are provided in Appendix C. Industry Canada regional representatives were engaged to assist in the delivery of the program at the local level. Their responsibilities included: promotion of the pilot program, liaising with communities, potential applicants and recipients; assisting in the competition process by collecting input on submissions from Regional Development Agencies,

other government agencies as well as from provincial and territorial governments. Results to date have been as follows:

- Under the two rounds of business plan development funding, 154 projects, representing approximately 2,285 communities, were selected to develop business plans that outlined their vision for the application of high-capacity Internet services. In total, \$4.2 M was invested in the development of these plans.
- Under the two rounds of business plan implementation funding, 63 projects, representing nearly 900 communities (including 142 First Nations reserves), were selected to receive a one-time investment in capital infrastructure. In total, \$80.3 M was invested in the implementation of broadband business plans.

The following table shows the distribution of Broadband Pilot Program implementation funding projects, the number of communities involved, the number of First Nation Reserves involved, amount of funds requested from the Broadband Pilot Program, and the total investment, as of February 2006.

Province/ Territory	Number of Projects	Number of Communities	Number of FN Reserves	Amount Requested	Total Project Costs
NL	11	96	0	\$10,653,762	\$22,315,112
PE	5	26	2	\$3,053,442	\$6,790,933
NS	7	58	4	\$7,575,176	\$15,818,881
NB	0	0	0	0	0
QC	8	226	9	\$18,184,985	\$42,029,807
ON	9	106	20	\$7,636,622	\$18,266,334
MB	5	117	25	\$6,767,091	\$14,169,699
SK	4	96	34	\$7,430,850	\$18,750,476
AB	1	11	6	\$318,440	\$636,880
BC	10	101	41	\$9,616,963	\$22,088,108
NU	1	24	0	\$3,885,000	\$8,712,622
NT	1	29	1	\$5,368,318	\$10,232,318
YT	1	6	0	\$222,806	\$470,090
Total	63	896	142	\$80,695,622	\$180,281,260

2.4 Resources

The Program began as a three-year, \$105 million initiative, commencing in fiscal year 2002-03. A total of \$15 million was provided to administer, deliver and manage the Broadband Pilot Program over the three years as follows:

Type of Funding	2002-03	2003-04	2004-05	Total
O&M	\$2.9M	\$6M	\$6.1M	\$15M
Community Champion Business Plan Development Funding	\$3.6M	\$3.9M	\$2.5M	\$10M
Implementation Funding	\$0	\$10M	\$70M	\$80M
Total	\$6.5M	\$19.9M	\$78.6M	\$105M

An extension of this funding in addition to a reprofile request as part of the Annual Reference Level Update was planned for the Fall 2004 as follows.

Type of Funding	2002-03	2003-04	2004-05	2005-06	2006-07	Total
O&M	\$2.9M	\$6M	\$6.1M			\$15M
Community Champion Business Plan Development Funding	\$3.6M	\$3.9M	\$2.5M			\$10M
Implementation Funding	\$0	\$10M	\$29.5M	\$42M	\$5M	\$86.5M
Total	\$6.5M	\$19.9M	\$38.1M	\$42M	\$5M	\$111.5M

2.5 Logic Model

The program’s logic model has been reproduced from the RMAF.

Broadband for Rural and Northern Development Pilot Program (Broadband Pilot Program): Results-Based Logic Model

Mission Statement: To support the deployment of broadband to unserved communities - with priority to First Nations, Inuit and Métis, northern, rural and remote communities - in order to demonstrate its economic, social and cultural benefits and improve the communities’ participation in the national and global economy.					
Reach: Canadian communities without Broadband access - with priority placed on First Nations, Inuit and Métis, northern, rural and remote communities; Other government departments (federal, provincial, territorial, municipal); Regional Development Agencies; Private Sector Not-for-Profit organizations; Professional Associations; Economic Development Agencies; Non-Government organizations; Telecommunications companies					
Activities <i>What is to be done?</i>	Outputs <i>What is to be produced?</i>	Reach <i>For whom?</i>	Immediate Outcomes <i>Results for recipients</i>	Intermediate Outcomes <i>Benefits & changes resulting from outputs</i>	Strategic Outcomes <i>Long-term results</i>
Development of assessment criteria	Assessment criteria	National Selection Committee; Provincial/Territorial Committees	<ul style="list-style-type: none"> Proposals selected for Business Plan development funding; Business Plans selected for implementation funding 	<ul style="list-style-type: none"> Improved access to broadband facilities and services in recipient First Nations, Inuit and Métis, northern, rural and remote communities. 	<ul style="list-style-type: none"> Increased sustainability through improved access, restructuring and economic growth in recipient communities

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Reach: Canadian communities without Broadband access - with priority placed on First Nations, Inuit and Métis, northern, rural and remote communities; Other government departments (federal, provincial, territorial, municipal); Regional Development Agencies; Private Sector Not-for-Profit organizations; Professional Associations; Economic Development Agencies; Non-Government organizations; Telecommunications companies					
Activities <i>What is to be done?</i>	Outputs <i>What is to be produced?</i>	Reach <i>For whom?</i>	Immediate Outcomes <i>Results for recipients</i>	Intermediate Outcomes <i>Benefits & changes resulting from outputs</i>	Strategic Outcomes <i>Long-term results</i>
Development of Terms of Reference for arms-length National Selection Committee, and guidelines for Provincial/Territorial Committees	Terms of Reference; Guidelines	National Selection Committee; Provincial/Territorial Committees	<ul style="list-style-type: none"> • Selection advice / recommendations provided to the Minister; 	<ul style="list-style-type: none"> • Increased awareness and use of broadband-dependent applications and services in recipient communities • Increased private sector participation in deployment of broadband points of presence in recipient First Nations, Inuit and Métis, northern, rural and remote communities 	<ul style="list-style-type: none"> • Increased socio-cultural benefits for recipient communities • Increased number of First Nations, Inuit and Métis, northern, rural and remote communities connected to the networked economy and to the world;

Mission Statement: To support the deployment of broadband to unserved communities - with priority to First Nations, Inuit and Métis, northern, rural and remote communities - in order to demonstrate its economic, social and cultural benefits and improve the communities' participation in the national and global economy.					
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Activities <i>What is to be done?</i>	Outputs <i>What is to be produced?</i>	Reach <i>For whom?</i>	Immediate Outcomes <i>Results for recipients</i>	Intermediate Outcomes <i>Benefits & changes resulting from outputs</i>	Strategic Outcomes <i>Long-term results</i>
Develop competition procedures for National Selection Committee and Provincial / Territorial Committees	Competition procedures	National Selection Committee; Provincial/Territorial Committees	<ul style="list-style-type: none"> • funding decisions made; 	<ul style="list-style-type: none"> • Increased access to on-line health, education, government and business services in recipient First Nations, Inuit and Métis, northern, rural and remote communities; • Improved economic opportunities for recipient First Nations, Inuit and Métis, northern, rural and remote communities; • Increased awareness of the benefits of broadband access; 	<ul style="list-style-type: none"> • Increased domestic and international awareness of Canada as a world-class leader in use of Broadband infrastructure

Mission Statement: To support the deployment of broadband to unserved communities - with priority to First Nations, Inuit and Métis, northern, rural and remote communities - in order to demonstrate its economic, social and cultural benefits and improve the communities' participation in the national and global economy.					
Reach: Canadian communities without Broadband access - with priority placed on First Nations, Inuit and Métis, northern, rural and remote communities; Other government departments (federal, provincial, territorial, municipal); Regional Development Agencies; Private Sector Not-for-Profit organizations; Professional Associations; Economic Development Agencies; Non-Government organizations; Telecommunications companies					
Activities <i>What is to be done?</i>	Outputs <i>What is to be produced?</i>	Reach <i>For whom?</i>	Immediate Outcomes <i>Results for recipients</i>	Intermediate Outcomes <i>Benefits & changes resulting from outputs</i>	Strategic Outcomes <i>Long-term results</i>
Assess community applications under program terms and conditions	Feedback reports (on results of assessment)	Applicants	<ul style="list-style-type: none"> • Increased inter- / intra-community collaboration, aggregation and stakeholder participation; • Recipient communities able to identify their broadband communications needs in Business Plans; • Creation of new community-based, not-for-profit organizations in unserved 		

Mission Statement: To support the deployment of broadband to unserved communities - with priority to First Nations, Inuit and Métis, northern, rural and remote communities - in order to demonstrate its economic, social and cultural benefits and improve the communities' participation in the national and global economy.					
Reach: Canadian communities without Broadband access - with priority placed on First Nations, Inuit and Métis, northern, rural and remote communities; Other government departments (federal, provincial, territorial, municipal); Regional Development Agencies; Private Sector Not-for-Profit organizations; Professional Associations; Economic Development Agencies; Non-Government organizations; Telecommunications companies					
Activities <i>What is to be done?</i>	Outputs <i>What is to be produced?</i>	Reach <i>For whom?</i>	Immediate Outcomes <i>Results for recipients</i>	Intermediate Outcomes <i>Benefits & changes resulting from outputs</i>	Strategic Outcomes <i>Long-term results</i>
Develop program delivery guidelines and administer contribution agreements	Issue program guidelines Business Plan development funding agreements Contribution agreements for Business Plan implementation funding	Recipient communities	<ul style="list-style-type: none"> • Increased understanding of program objectives and responsibilities of applicants • Increased capacity of recipient communities to develop and use on-line applications and services; • Improved access to broadband infrastructure in First Nations, Inuit and Métis, northern, rural and remote communities; • Increased leverage from other government departments (OGDs), NGOs and other agencies 		

Mission Statement: To support the deployment of broadband to unserved communities - with priority to First Nations, Inuit and Métis, northern, rural and remote communities - in order to demonstrate its economic, social and cultural benefits and improve the communities' participation in the national and global economy.					
Reach: Canadian communities without Broadband access - with priority placed on First Nations, Inuit and Métis, northern, rural and remote communities; Other government departments (federal, provincial, territorial, municipal); Regional Development Agencies; Private Sector Not-for-Profit organizations; Professional Associations; Economic Development Agencies; Non-Government organizations; Telecommunications companies					
Activities <i>What is to be done?</i>	Outputs <i>What is to be produced?</i>	Reach <i>For whom?</i>	Immediate Outcomes <i>Results for recipients</i>	Intermediate Outcomes <i>Benefits & changes resulting from outputs</i>	Strategic Outcomes <i>Long-term results</i>
Program promotion to communities and other interested parties	<ul style="list-style-type: none"> • Web content • tools - i.e., maps, marketplace site, etc. • reference materials - i.e., application guidelines, best practices, lessons learned, etc. • Communications products • Presentation decks; • OGD/RDA networking contacts • Collaborative agreements and partnerships 	<ul style="list-style-type: none"> • community champions; interested applicants; OGDs; NGOs; general public; • Service providers and suppliers • OGDs; NGOs; general public • unserved communities 	<ul style="list-style-type: none"> • Increased business opportunities for local service providers and suppliers; • Increased opportunities to share best practices among communities across Canada; • Increased community awareness of the benefits of high-speed access; • Greater awareness of BB Program • Increased partner awareness of the benefits to unserved communities of high-speed access; • Increased community involvement by from other government 		

3.0 Relevance

3.1 The Broadband Pilot Program Closes a Gap

Is there a necessary role for the federal government in promoting and facilitating the deployment of broadband facilities and services to unserved Canadian communities? Does the Broadband Pilot Program address or attempt to close a gap which would widen in the absence of federal support?

Promoting and facilitating the deployment of broadband services to unserved communities does fall within federal government's mandate under the *Telecommunications Act*. Through the Broadband Pilot Program, the federal government has been able to facilitate the deployment of broadband access in some rural and northern communities by matching federal funding to stakeholder funds. This has closed a gap in service between these communities and urban communities, which would possibly widen given: limited population and growth in these communities, which limits the market base; cost of running cables and hardware to remote areas; cost of servicing equipment; all of which are contributing factors that limit the possibility of the provision of service by vendors.

Virtually all community champions indicated that without government assistance there would be no business case for providing broadband services to their communities. If left to the market, only the most populated areas would be connected. One community champion summed up the general sentiment by noting that, "Telcos and Internet providers expand services solely based on market strength. For rural communities, frankly we cannot compete with market demand that growing urban areas can generate." Another community champion indicated that "getting broadband to (our region) would probably have been impossible had it not been for the Broadband Pilot Program. With (our region's) sparsely populated areas establishing the business case for broadband services to the telco was for the most part impossible."

It is assumed by major urban centres and young people that broadband is so vital to their lives that it will always be there. For example:

- On March 7, 2006, Toronto Hydro Telecom Inc. announced plans to blanket downtown Toronto with wireless fidelity (WiFi) coverage. According to Toronto Hydro Telecom, blanketing the downtown core with seamless and lower-cost network access opens the door to multiple opportunities for innovation in access to information and communication for residents, community groups, underserved communities and small businesses.
- According to Networked World⁷, there are some 320 U.S. municipalities that have or are planning to cover themselves with broadband wireless networks.

⁷ <http://www.networkworld.com/research/2006/030606-municipal-wi-fi.html?rlt=03>

- As noted by Business Week⁸, young people today (who have access to broadband) are the first cohort to grow up fully wired and technologically fluent. Today's teens and twentysomethings are flocking to web sites such as MySpace.com to establish their social identities. Although networks are still in their infancy, experts think they're already creating new forms of social behaviour that blur the distinctions between online and real-world interactions. In fact, today's young generation largely ignores the difference. Most adults see the web as a supplement to their daily lives. The "MySpace" generation, by contrast, lives comfortably in both worlds at once. Increasingly, America's youth use social networks as virtual community centres, a place to go and sit for a while (sometimes hours).

Broadband is essential today, whether it's a major urban centre like Toronto or a remote community in Nunavut, it helps to level the playing field with urban/southern communities. Whether a community has broadband can be the deciding factor by professionals (e.g., doctors) and businesses if they are going to locate/set-up a practice/company. Many remote communities do not have a high school. In order to complete their secondary education, young people are forced to leave their family and community. Several community champions from remote communities (e.g., community is only accessible by plane) believe that having broadband is particularly important for young people, as illustrated by the Business Week article. Being able to connect with peers in other communities (e.g., southern Canada, other countries) helps to remove the feeling of isolation and a sense of belonging to the "myspace" generation. While evidence is difficult to find, many community champions believe that having broadband will help to lower the suicide rate amongst young people living in remote communities. One small vendor, however, indicated that they had been thanked by a remote Quebec community for providing broadband service. According to the community, having broadband, "helped one youth to avoid suicide. We couldn't believe that something we do (ICT infrastructure) would save lives".

As noted below in Table 3-1, 84% of community champions agreed or strongly agreed with the statement that the Broadband Pilot Program closes a gap that would otherwise widen, in the absence of federal support. However, five respondents (16%) neither agreed nor disagreed with the statement, noted that there are still unserved areas within their Broadband Pilot Program project area. Seven projects excluded some communities from their submission to the Broadband Pilot Program because it was felt they would not be able to meet the sustainability requirement of the Program, or because they were required to remove some communities by the vendor/telco. One community champion described this situation very well by noting that broadband "has helped those in the served communities, but it has brought the digital divide further down the system. Within one region, some are covered by broadband while others are not. The division is now at a local level as opposed to a provincial level." Another community champion asked rhetorically, "how do you say we are "serviced" when one town has broadband but not the surrounding rural area. The definitions of serviced are questionable".

Several representatives of unserved communities shared this perspective of local regional differences and the ability to sustain broadband services. This is particularly apparent in southern Ontario where the general perception is that the area is well served. According to these

⁸ Jessi Hempel, "The MySpace Generation: They Live Online, They Buy Online, They Play Online, Their Power Is Growing", Business Week, December 12, 2005, pp. 86-96.

respondents, it is also a perception that is reinforced by the major telcos.⁹ They point out that there are many areas, even in well populated southern Ontario, that are still not served by broadband.

Table 3-1: Does the Broadband Pilot Program address or attempt to close a gap which would widen in the absence of federal support?

Score	Community Champion Interviews	Community Champion Survey	Total	Percent
1 – strongly disagree	0	0	0	0%
2 – disagree	0	0	0	0%
3 – neither disagree/agree	2	3	5	16%
4 – agree	1	5	6	19%
5 – strongly agree	8	13	21	66%
Total	11	21	32	100%
Average Score	4.5	4.5	4.5	

3.2 Continuing Need to Invest

Is there a continuing need for the federal government to invest in broadband? What would be the impact to unserved communities particularly First Nations, Inuit and Métis, northern, rural and remote communities of terminating funding for broadband? Do communities continue to see this as a need or priority for public investment?

Most respondents feel that there is a continuing need for government to invest in broadband, and the number of communities without broadband services supports their view. As noted earlier, in 2001, it was estimated that 4,000 communities did not have access to broadband. Although the Broadband Pilot Program connected 896 communities (and other programs connected a further 1,100 communities) in the last three years, it is estimated that roughly 2,000 communities remain to be connected as of March 2006.

In our small sample of eight unserved communities: half managed to get broadband through provincial programs, and half are still without broadband services. This is consistent with the nation-wide trend, with half the communities getting access to broadband over the 2001-2005 period, and half are still without broadband services.

It is important to note that there are still some local regions within existing Broadband Pilot Program projects that still do not have access to broadband. The community champions from these projects expressed a strong desire for the Broadband Pilot Program to be continued, so that broadband services can be extended to these remaining communities.

⁹ An interview with a retired major telco employee confirmed this perception.

As noted below in Table 3-2, over 90% of community champions and broadband users indicated that they could not go without broadband, and there would be significant negative impacts if they no longer had access to broadband; only two respondents (5%) were not sure if they could nor could not go without broadband. One community champion summed up the feeling by saying that, “really, there is no going back now. I imagine that there would be a storm of protest, and even vandalism against (the telco/service provider) if they pulled out. Once people have had broadband, it would be like telling people that they have to give up their telephones and go back to the telegraph. It would be akin to rolling up the pavement and going back to dirt roads”.

Table 3-2: Now that you/your communities have had some experience with high-speed Internet do you think you/your communities could go without broadband?

Score	Community Champion Interviews	Community Champion Survey	Broadband User Interviews	Total	Percent
1 – definitely could	0	0	0	0	0%
2 – could	0	0	0	0	0%
3 – neither could/could not	0	2	0	2	5%
4 – could not	0	4	1	5	11%
5 – definitely could not	10	15	12	37	84%
Total	10	21	13	44	100%
Average Score	5.0	4.6	4.9	4.8	

Overwhelmingly, communities see broadband as a continuing need and a priority for investment. This view is corroborated by an interesting study conducted by the Rural Development Institute, Brandon University¹⁰, on Churchill, Manitoba, which established broadband services in 2002, then lost the services in 2005, and is now trying to re-establish these services. As noted by the study, with broadband no longer available in Churchill as of May 2005, respondents realized the value and importance of broadband to their operations. Consequently, four businesses have reported that they have had Manitoba Telecom Services (MTS), the largest private communications in Manitoba, to install private high-speed Internet connections. The annualized cost of re-establishing high-speed connection was \$32,400. One of the business owners noted that paying for this new service is unsustainable in the long-term, however, it was required to ensure the needs of the clients. Another private sector example is a tour company that is paying \$900/month for their own custom broadband connection since the community’s broadband service was discontinued in May 2005. This is in contrast to the average of \$50 per month paid in a city. A similar comment was made by a respondent from the public sector. “When the DSL service went down, we began investigating options available to have high-speed re-established. For us to function at full capacity, it was necessary to re-establish a high-speed connection. In partnership with two other local businesses, MTS installed a 512 DSL cable line. The monthly

¹⁰ Rural Development Institute, Brandon University, Industry Canada Broadband Economic Impact Study, Final Report, September 15, 2005, pp. 16 and 32.

cost of the DSL service is very, very expensive, but this is something that we realized was necessary to continue operating the way we have”.

3.3 Effect on ICT Infrastructure and Industry

What effect has the Broadband Pilot Program had on Canada's ICT infrastructure? Canada's ICT industry?

Broadband has been extended to more communities than expected. The Broadband Pilot Program reached/provided broadband service to 896 communities, or over twice the original expectation of 400 communities. There were two reasons for this:

- Many projects ended up including communities outside the “project area”, or jurisdiction in the case of community futures development corporations. When other communities learned that their neighbours were applying to the Broadband Pilot Program, they wanted to be included. A partnership was created and a joint proposal developed that included communities from both regions/jurisdictions, rather than developing separate proposals.
- Some vendors included more communities due to the nature of the technology. As one vendor explained, the way their network runs, in some cases they have to connect community A in order to reach community B. If community B was the project applicant, then community A was connected as a result of community B's project.

When vendors were asked for the likelihood that they would have provided broadband services if funding from the Broadband Pilot Program had not been available, their response was very similar to the reply from the community champions; without government assistance there is simply no business case to provide broadband services to sparsely populated communities within a reasonable timeframe. As shown below in Table 3-3, 93% of business partners (vendors, ISPs) indicated that without Broadband Pilot Program funds it was unlikely, or very unlikely, that they would have provided broadband services to these communities; 90% of community champions felt that without Broadband Pilot Program funds it was unlikely or very unlikely that they would have received broadband services. Three respondents (7%) were not sure if Broadband Pilot Program funds would have helped or not. These three respondents and a few vendors noted that, in theory, a few communities might have been provided with broadband in 2-3 years assuming that costs declined with technological advances, but for most communities there is no business case in the immediate or intermediate term even with technological advances and cost reductions; they would never get access to broadband services without some support from government.

As one vendor noted, “the Broadband Pilot Program made it possible for (our organization) to consider or advance sites that would normally not be economically viable due to their location and/or population. Innovative infrastructure funding programs were required to bring broadband services to rural communities. Private sector investment in these areas typically would not occur over the foreseeable future without acceptable private/public funding programs to lower the cost barriers to enter these low density markets”.

Table 3-3: What is the likelihood that your organization would have provided broadband services if funding from the Broadband Pilot Program was not available?

Score	Vendor / ISP Interviews	Community Champion Interviews	Community Champion Survey	Total	Percent
1 – very unlikely	5	8	19	32	74%
2 – unlikely	5	1	2	8	19%
3 – neither unlikely/likely	1	2	0	3	7%
4 – likely	0	0	0	0	0%
5 – very likely	0	0	0	0	0%
Total	11	11	21	43	100%
Average Score	1.6	1.5	1.1	1.3	

For communities whose only access is via satellite, technological advances are increasing the likelihood of getting affordable broadband services. Ka band VSAT (very small aperture terminal) Internet technology shows significant promise/possibilities for remote communities. For example, Barrett Xplore, one of Telesat’s authorized dealers, indicates that the monthly cost for satellite (Ka band) Internet service in say Pond Inlet, Nunavut ranges from \$55/month for 512 Kbps, \$90/month for 1.0 Mbps, \$135/month for 1.5 Mbps and \$180/month for 2.0 Mbps. Although the cost differential with urban/southern communities is still large, the cost for satellite (Ka band) Internet is expected to continue to decline. Consequently, according to one respondent, local vendors will be withdrawing from the northern/remote residential market because they cannot compete with Ka band.

3.4 Importance of Broadband

How important is broadband to the participation of Canada’s First Nations, Inuit and Métis, northern, rural and remote communities in the Networked Economy?

Broadband is considered to be “very important” by all users consulted by the study, and by 90% of vendors/ISPs and community champion interviewees, as shown below in Table 3-4. Interestingly, only 62% of community champion survey respondents feel that broadband is “very important”, with 38% indicating that it is important. It should be noted that community champion survey respondents are representatives of ongoing or recently completed projects, whereas community champion interviewees are representatives of completed projects, often with more than one year experience with broadband. It would appear that the importance of broadband increases with use. There were no differences between First Nations and non-First Nations communities on the importance of broadband.

One user, typical of many respondents consulted by the study, noted that she uses broadband to conduct research for her work, and her children use broadband to conduct research for their schoolwork. She said jokingly, “If I didn’t have high-speed, my kids wouldn’t want to live with me, it’s that important to them”. A user in a remote arctic community indicated that without

broadband, she would no longer be able to live in her community, as her job is in the south and she must telecommute.

Table 3-4: How important is broadband in order for you/your communities to participate in the national and global economy?

Score	Comm. Champ Interviews	Comm. Champ Survey	Vendor / ISP Interviews	BB User Interviews	Total	Percent
1 – very unimportant	0	0	0	0	0	0%
2 – unimportant	0	0	0	0	0	0%
3 – neither	0	0	0	0	0	0%
4 – important	1	8	1	0	10	18%
5 – very important	10	13	10	13	46	82%
Total	11	21	11	13	56	100%
Average Score	4.9	4.6	4.9	5.0	4.8	

3.5 Broadband Continues to Make Sense

Do the Broadband Pilot Program’s activities continue to make sense in light of the sustainability – economic, environmental and social – of Canada’s First Nations, Inuit and Métis, northern, rural and remote communities?

Based on the responses from community champions, vendors/ISPs, broadband users, and Program staff, the Broadband Pilot Program’s activities continue to make sense. Broadband services have the potential to greatly enhance the lives of Canadians – both those in cities or in urban, rural and Aboriginal communities – whether through more learning and cultural opportunities, better access to improved health care or enhanced economic opportunities. Ninety percent of communities, and seventy percent of First Nations communities, indicated that investing in broadband continues to make sense.

A broadband user summed up the effect of having broadband on his community very eloquently by noting that, “as it relates to social and economic development within (our region), broadband is an important tool that enables us to take a proactive approach in moving the agenda forward enhancing economic development initiatives and fostering social stability. In education for example, individuals have easier access to home based training. In health, doctors and nurses can easily and effectively communicate with counterparts, ensuring quick collaboration that may save lives. Any group or organization with the introduction of broadband has easier access to information, government programs, research options that permits easier development of initiatives that can benefit a region socially and economically.” As one community champion noted, “*Le service à large bande va empêcher l'exode de nos entreprises. C'est l'une des meilleures choses pour notre région.*”

4.0 Success

4.1 Needs Identified

To what extent has the Broadband Pilot Program encouraged First Nations, Inuit and Métis, northern, rural and remote communities to identify their high-speed communications needs?

Most community champions (63%) agreed or strongly agreed that the Broadband Pilot Program helped their communities to identify and articulate their ICT needs, and 16% disagreed or strongly disagreed with the statement (i.e., the Broadband Pilot Program had no impact on identifying their needs), as shown below in Table 4-1. Community champions qualified their scores, with 9 of 11 interviewees, indicating that the community already knew their needs but that the business planning process of the Broadband Pilot Program helped to get the community behind the project and/or to examine their needs in greater detail and/or to refine their needs. One community champion summed up this view by noting that, “any kind of a business planning process forces people to think what they want to do. But (our communities) started in 1997, that’s how badly we wanted it (broadband)”. First Nations communities’ average score was slightly lower at 3.4, compared to the average of 3.7 for non-First Nations communities.

Table 4-1: The Broadband Pilot Program, and the process of developing our business plan, helped our communities identify and articulate our Information and Communication Technologies (ICT) needs

Score	Community Champion Interviews	Community Champion Survey	Total	Percent
1 – strongly disagree	0	1	1	3%
2 – disagree	1	3	4	13%
3 – neither disagree/agree	2	5	7	22%
4 – agree	3	10	13	41%
5 – strongly agree	5	2	7	22%
Total	11	21	32	100%
Average Score	4.1	3.4	3.7	

The level of community engagement and support for their Broadband Pilot Program project/getting broadband was considered to be very high or high by 76% of community champions who responded to the survey, as noted below in Table 4-2.

Table 4-2: What was the level of community engagement/support for your Broadband Pilot Program project?

Score	Broadband User Interviews	Percent
1 – very low	0	0%
2 – low	0	0%
3 – neither low nor high	5	24%
4 – high	7	33%
5 – very high	9	43%
Total	21	100%
Average Score	4.6	

For the most part, the level of community engagement and support remained constant over the life of the Broadband Pilot Program project according to 67% of community champions who responded to the survey, as noted below in Table 4-3.

Table 4-3: Did the level of community engagement/support for your Broadband Pilot Program project change over time?

Score	Broadband User Interviews	Percent
1 – significant decrease	1	5%
2 – decrease	1	5%
3 – no change	14	67%
4 – increase	3	14%
5 – significant increase	2	10%
Total	21	100%
Average Score	4.6	

4.2 Adoption and Use

How successful has the Broadband Pilot Program been in promoting the adoption and use of innovative ICT applications and services in First Nations, Inuit and Métis, northern, rural and remote communities?

Broadband has been successful in promoting the adoption and use of innovative ICT applications and services, as noted by community champions and broadband users themselves. In the community champion survey, respondents were asked to rank various ICT needs in terms of their importance to their communities. The first half of Table 4-4 shows the number of respondents, and the second half the percentage distribution. As noted below in Table 4-4, economic development and education are ranked as the most important need, followed by community access (ending isolation), with employment and health each ranked fourth. There were no differences in ranking between First Nations and non-First Nations communities.

Table 4-4: Please rank the following needs in terms of their importance to your communities (1-very unimportant to 5-very important)

Need	Level of Importance					Total
	1	2	3	4	5	
Health	0	3	2	3	13	21
Education	0	0	3	2	16	21
Justice	2	5	8	2	4	21
Employment	0	1	3	4	13	21
Commerce (including e-commerce)	0	2	2	8	9	21
Home Businesses	0	1	4	5	11	21
Telecommute	0	3	3	6	9	21
Government	1	2	4	4	9	20
Economic Development	0	1	0	4	16	21
Community Access (ending isolation)	0	1	3	3	14	21
Cultural	0	2	9	2	8	21
Youth	0	2	1	8	10	21
Population Retention	1	1	2	5	12	21
Tourism	0	1	0	8	12	21

Need	Level of Importance					Total
	1	2	3	4	5	
Health	0%	14.3%	9.5%	14.3%	61.9%	100%
Education	0%	0%	14.3%	9.5%	76.2%	100%
Justice	9.5%	23.8%	38.1%	9.5%	19.0%	100%
Employment	0%	4.8%	14.3%	19.0%	61.9%	100%
Commerce (including e-commerce)	0%	9.5%	9.5%	38.1%	42.9%	100%
Home Businesses	0%	4.8%	19.0%	23.8%	52.4%	100%
Telecommute	0%	14.3%	14.3%	28.6%	42.9%	100%
Government	5.0%	10.0%	20.0%	20.0%	45.0%	100%
Economic Development	0%	4.8%	0%	19.0%	76.2%	100%

Need	Level of Importance					Total
	1	2	3	4	5	
Community Access (ending isolation)	0%	4.8%	14.3%	14.3%	66.7%	100%
Cultural	0%	9.5%	42.9%	9.5%	38.1%	100%
Youth	0%	9.5%	4.8%	38.1%	47.6%	100%
Population Retention	4.8%	4.8%	9.5%	23.8%	57.1%	100%
Tourism	0%	4.8%	0%	38.1%	57.1%	100%

The community champion survey also asked respondents to rank various ICT applications in terms of their importance to their communities. The first half of Table 4-5 shows the number of respondents, and the second half the percentage distribution. As noted below in Table 4-5, email is ranked as the most important application, followed by research and downloading files. Three applications were ranked third, they are: e-banking, distance education and CAP (community access program) centres. There were no differences in ranking between First Nations and non-First Nations communities.

Table 4-5: Please rank the following applications/uses in terms of their importance to your communities (1-very unimportant to 5-very important)

Application	Level of Importance					Total
	1	2	3	4	5	
E-banking	0	0	4	8	9	21
Online purchasing	0	1	5	9	6	21
E-mail	0	0	2	4	15	21
Distance Education	0	0	4	8	9	21
CAP Centres	0	2	4	5	9	20
Job searches	0	3	4	8	6	21
Online marketing	0	2	5	7	7	21
Researching and downloading files	0	0	3	7	11	21
Tele-health services	0	2	5	7	7	21
Video streaming/conferencing	0	3	7	5	6	21
Online government	1	2	4	8	6	21

Application	Level of Importance					Total
	1	2	3	4	5	
E-banking	0%	0%	19.0%	38.1%	42.9%	100%
Online purchasing	0%	4.8%	23.8%	42.9%	28.6%	100%
E-mail	0%	0%	9.5%	19.0%	71.4%	100%
Distance Education	0%	0%	19.0%	38.1%	42.9%	100%
CAP Centres	0%	10.0%	20.0%	25.0%	45.0%	100%
Job searches	0%	14.3%	19.0%	38.1%	28.6%	100%
Online marketing	0%	9.5%	23.8%	33.3%	33.3%	100%
Researching and downloading files	0%	0%	14.3%	33.3%	52.4%	100%
Tele-health services	0%	9.5%	23.8%	33.3%	33.3%	100%
Video streaming/conferencing	0%	14.3%	33.3%	23.8%	28.6%	100%
Online government	4.8%	9.5%	19.0%	38.1%	28.6%	100%

Most users (85%) consulted by the study indicated that their use of/reliance on the Internet has increased significantly since getting a high-speed connection, as noted below in Table 4-6. Some user testimonials regarding the use of broadband are provided below:

- “My ability to stay in touch with the people I am working with in far-flung communities has increased. As a consequence, my phone and mailing bills are lower as are response wait times”.
- “My use has increased a great deal. Bank much quicker. Find information much quicker. It’s a must have (sic) these days of great technology.”
- “I was using dial up before and having high speed takes a lot of frustration out of trying to use the computer in the North. Also it doesn’t tie up my phone line so that is very good.”
- “I can now see some pictures that my friends and old teachers have to send, even if they are quite a big size, because I don’t have to wait half hour for one photo to appear. I can ask for technical support through email for my job related topics which seems to be almost every other day.”
- “I use it for e-banking and online purchases, and I enjoy some of the radio stations that you can get off the Internet.”
- “I use it a lot for work, do research on the Internet. I’m on a lot of volunteer boards, and do a lot of research on the Internet for these boards. My children use it, find it very helpful. I use it for online purchases and for travel.”

- “My use is the same, it is just much easier since I do not have to use dial-up. Connections are faster and I send a lot of attachments, so this is easier.”

Table 4-6: Has your use of/reliance on the Internet increased because you now have a high-speed connection?

Score	Broadband User Interviews	Percent
1 – significantly decreased	0	0%
2 – decreased	1	3%
3 – no change	1	8%
4 – increased	0	0%
5 – significantly increased	11	85%
Total	13	100%
Average Score	4.6	

4.3 Greater Collaboration

To what extent has the Broadband Pilot Program contributed to collaboration amongst and within Canada’s First Nations, Inuit and Métis, northern, rural and remote communities?

As noted below in Table 4-7, 69% of community champions indicated that the Broadband Pilot Program contributed to greater collaboration amongst and within communities (scores of 4 or 5), only 9% said that the Program had not contributed to greater collaboration (scores of 1 or 2), with 22% indicating that the Program neither encouraged or discouraged collaboration (score of 3). The average score for First Nations communities at 4.0 is slightly higher than for non-First Nations communities with an average score of 3.8.

Table 4-7: The Broadband Pilot Program, and the process of developing our business plan, encouraged organizations and communities to collaborate/interact with other organizations, other communities

Score	Community Champion Interviews	Community Champion Survey	Total	Percent
1 – strongly disagree	0	1	1	3%
2 – disagree	0	2	2	6%
3 – neither disagree/agree	3	4	7	22%
4 – agree	2	11	13	41%
5 – strongly agree	6	3	9	28%
Total	11	21	32	100%
Average Score	4.2	3.6	3.8	

There are more communities working together today because having a high-speed connection makes it easier to communicate/interact with others. As one community champion noted: “there

has been more collaboration within our region and outside our region. There are eight others in the province like me involved in ICT, and we've got together over the Internet to discuss different projects." Another respondent indicated that she collaborates with 16 others like her, to share best practices and lessons learned. Yet another indicated that new partnerships have been formed as a result of collaborations between the communities, school board and health system.

4.4 ICT Infrastructure Augmented

To what extent has the Broadband Pilot Program helped to augment the ICT infrastructure in Canada's First Nations, Inuit and Métis, northern, rural and remote communities?

The Broadband Pilot Program has helped to extend broadband services to communities that would otherwise not have been served if left to the market. As noted earlier in Section 3.3, Table 3-3, 93% of business partners (vendors, ISPs) indicated that without Broadband Pilot Program funds, it was unlikely, or very unlikely that they would have provided broadband services to these communities; 90% of community champions felt that without Broadband Pilot Program funds, it was unlikely or very unlikely that they would have received broadband services. As a result of this augmentation, it would appear that the proportion of households with a computer is expected to increase (the IT infrastructure) and not surprisingly the use of broadband is expected to increase (the CT infrastructure).

IT Infrastructure: Table 4-8 shows community champions' estimates of the number of households in their communities that have a computer; half the community champions estimated that 40-59% of households in their communities have a computer, one-third estimated that 60-79% of households have a computer, 16% estimated that 20-39% of households have a computer, and 1 community champion estimated that up to 19% of households have a computer. As noted in Table 4-9, 75% of community champions consulted by the study estimate that the proportion of households with a computer will increase or significantly increase in the future.

Table 4-8: Please provide an estimate of the percentage of households in your communities that have a computer

Score	Community Champion Survey	Percent
0 – 19%	1	5%
20 – 39%	3	16%
40 – 59%	9	47%
60 – 79%	6	32%
80 – 100%	0	0%
Total	19	100%

Table 4-9: Do you expect the percentage of households with a computer, in your communities, to increase in the future?

Score	Community Champion Survey	Percent
1 – significant decrease	0	0%
2 – decrease	1	5%
3 – no change	4	20%
4 – increase	11	55%
5 – significant increase	4	20%
Total	20	100%

CT Infrastructure: Table 4-10 shows community champions' estimates of the number of people in their communities using broadband; 45% of community champions estimated that 20-39% of people in their communities use broadband, 30% estimated that 40-59% of people use broadband, 20% estimated that up to 19% of people use broadband, and 1 community champion estimated that 60-79% of people in their communities use broadband. More importantly, however, 95% of community champions estimate that the percentage of people in their communities using broadband will increase or increase significantly in the future, as noted below in Table 4-11.

Table 4-10: Please provide an estimate of the percentage of people using broadband (high-speed Internet) in your communities

Score	Community Champion Survey	Percent
0 – 19%	4	20%
20 – 39%	9	45%
40 – 59%	6	30%
60 – 79%	1	5%
80 – 100%	0	0%
Total	20	100%

Table 4-11: Do you expect the percentage of people using broadband (high-speed Internet), in your communities, to increase in the future?

Score	Community Champion Survey	Percent
1 – significant decrease	0	0%
2 – decrease	0	0%
3 – no change	1	5%
4 – increase	9	43%
5 – significant increase	11	52%
Total	21	100%

One community champion commented on both the augmentation of the infrastructure and the increased use of broadband by noting that, “there are efforts to work with individuals and groups to build knowledge and skills. (The vendor) is already adding capacity to the broadband network to accommodate the demand that has already taken place since the roll-out. This is a testament to the value of the (broadband) services to individuals and communities”.

4.5 Creation of New Organizations

To what extent has the Broadband Pilot Program led to the creation of new organizations – not-for-profit or otherwise – in First Nations, Inuit and Métis, northern, rural and remote communities?

One-quarter (8) of community champions consulted by the study (survey and interviews) felt that broadband has led to the creation of new, not-for-profit, organizations in their communities, while three-quarters (24) did not. Of the eight community champions who indicated that new organizations had been created, 75% (6) of the community champions felt that there was a direct link. Only one respondent elaborated on the type of new organizations, indicating that most of the new organizations are community groups.

4.6 Internet Use for Education, Health

To what extent has the Broadband Pilot Program encouraged and supported the use of the Internet in First Nations, Inuit and Métis, northern, rural and remote communities for commerce? For education? For health?

As noted earlier in Section 4.2, Table 4-4, education and economic development are ranked as the most important need, followed by community access (ending isolation), with health and employment each ranked fourth. Many community champions indicated that one of the main reasons their communities wanted broadband was for their children/youth, to be on par with their counterparts in urban and southern communities. For youth, education and community access (being able to connect with youth in other communities) were cited as the two most important needs. For remote communities without a local high school, current practice is for their children to live away from home in a community that has a high school. Having broadband is seen as being particularly important since the hope is that their children will one day be able to complete their high school education within their communities and thereby counter outward migration trends. Selected comments by community champions regarding education are provided below:

- Distance education is starting to increase. We don't have to bus our children since our council office has video conferencing. Now they (children) can stay in town, at the council office, to attend class, rather than being bussed to the nearest town.
- Schools and many households now have access to high speed Internet, allowing students to conduct research and have access to more information. Research can be conducted in a timely manner. Advanced level high school classes are offered through a Provincial Program online, now that the communities have high speed Internet access it is possible for students to take these classes (the respondent's daughter is taking advanced classes over the Internet). Community members also have access to post-secondary education through distance education, both undergraduate and graduate studies (respondent is working on a Master's degree).

- I see more people doing research on the Internet. Schools are using it (broadband) in a big way. There are a lot of speech therapy classes over the Internet (remote First Nations community).
- [benefits of broadband] enhanced access to media rich distance education programming over multiple sectors – K-12, post-secondary, continuing education, community-based learning projects, more effective student access to Internet resources, multi-site video teaching and teacher in-services.
- There are a couple of people doing distance education. This is just the beginning. Hopefully there will be more.

A key benefit of having broadband for health is the reduced number of hospital visits. As one community champion noted, “The high costs of travelling and delivery of services to rural and remote communities is very much a reality for (our) communities. Broadband services will help to alleviate some of these costs. For example, a mother in (community X) has to travel with her daughter to (the provincial capital) every three months for consultations with an Ear, Nose and Throat (ENT) Specialist. These visits normally take 15-20 minutes and cost an average of \$2,400 in travelling expenses for each visit. These consultations can now be performed in the community with the use of an ENT probe at the local health clinic, connecting to the Specialist through a high speed connection”.

Another benefit to the health sector is being able to attract medical professionals. Several community champions indicated that one of the first questions a medical doctor will ask, when deciding where to set up practice, is if the community has broadband.

4.7 Contribution to Sustainability

How do the Broadband Pilot Program’s objectives contribute to sustainable development of targeted communities? To what extent has broadband contributed to the sustainability – economic, environmental and social – and growth of Canada’s First Nations, Inuit and Métis, northern, rural and remote communities?

As noted earlier, broadband contributes to the sustainable development, including the economic, environmental and social growth, of communities by:

- Helping to “level the playing field” with urban/southern communities. Broadband is essential today for sustainability, and has become a “must have” infrastructure such as clean water, electricity, and telephone. This is consistent with the conclusions of the *Report of the National Selection Committee on the Broadband for Rural and Northern Development Pilot Program*, where it notes that, “broadband will help Canadians build a 21st century economy by innovating and creating new jobs in every economic sector, by providing opportunities for skills development and life-long learning, and by achieving environmentally-friendly sustainable development.
- The economic sustainability of communities was illustrated by the case study of Churchill, Manitoba conducted by the Rural Development Institute, Brandon University, which struggled to get dial-up, then migrated to broadband, and then lost their high speed Internet. Given that some organizations are now paying extremely high premiums in order to re-

establish their broadband connection demonstrates how important broadband is to economic sustainability. Additional findings on broadband's contribution to economic sustainability are provided below in Sections 4.9 and 4.11.

- Broadband holds particular promise for First Nations, Inuit and Métis communities, as noted above in sections 3.5 and 4.6 and by the Report of the National Selection Committee. Broadband will help them maintain traditional governance structures, cultures and ways of life while taking full advantage of the economic, educational, and health care opportunities available to all Canadians.
- Broadband has been particularly beneficial in education. Students, by being able to conduct research over the Internet, have access to similar educational resources that their urban/southern peers enjoy. If people can remain in the communities while completing their education (e.g., high school, college, university) they keep the communities alive.
- An example of the environmental sustainability of communities was illustrated by the “avoided transportation” with respect to health care. Not only does the patient avoid having to make as many trips, the patient is diagnosed and/or monitored immediately thereby reducing any risks and further complications. The same environmental benefits of avoided transportation apply to other sectors.
- The social sustainability, particularly for youth in the “myspace” generation by allowing them to be a part of virtual community centres, makes them no different than their urban/southern peers.

The study also asked if broadband services can be sustained. If broadband cannot be sustained, i.e., the service no longer exists, it cannot contribute to sustainable development, as was the case with Churchill, Manitoba. As noted below in Table 4-12, 78% of community champions consulted by the study believe that broadband services are very likely or likely to be sustained in their communities, 9% felt that it was not likely to be sustained, and 9% did not feel comfortable providing such a forecast/estimate.

Table 4-12: Your business plan indicates that broadband can be sustained in your communities. Now that your Broadband Pilot Program Project has been completed, has the prospect of long-term sustainability changed?

Score	Community Champion Interviews	Community Champion Survey	Total	Percent
1 – very unlikely to be sustained	0	0	0	0%
2 – unlikely to be sustained	0	3	3	9%
3 – neither unlikely nor likely	1	2	3	9%
4 – likely to be sustained	2	5	7	22%
5 – very likely to be sustained	8	10	18	56%
Total	11	21	32	100%
Average Score	4.6	4.1	4.3	

Just over half the business partners (vendors, ISPs) indicated that the uptake of broadband has been sufficient or very sufficient to support their business model/make a profit, 36% indicated that the uptake was neither sufficient nor insufficient, and one business partner indicated that the uptake was insufficient to support their business model/make a profit, as noted below in Table 4-13. Business partners who indicated that the uptake was neither sufficient nor insufficient, added that their prime motivation for extending broadband services to these communities was for “social good/community relations” reasons rather than for profit.

Perhaps more importantly, when users were asked if they expect to continue subscribing to broadband in 1-2 years, in 3-5 years, almost all users consulted by the study indicated that they would continue to subscribe to broadband in 3-5 years; one user will continue to subscribe but did not give a forecast in years. More importantly, over half added that they would continue to subscribe beyond five years.

Table 4-13: Has the uptake of broadband (high speed Internet), by the communities in the Broadband Pilot Program project you were involved with, been sufficient to support your business model, make a profit?

Score	Vendor/ISP Interviews	Percent
1 – uptake very insufficient, not profitable	0	0%
2 – uptake insufficient, not profitable	1	9%
3 – uptake neither insufficient nor sufficient	4	36%
4 – uptake sufficient, profitable	4	36%
5 – uptake very sufficient, profitable	2	18%
Total	11	100%

4.8 Capacity Increased

Has the Broadband Pilot Program increased the capacity of organizations and individuals in First Nations, Inuit and Métis, northern, rural and remote communities to use and extract value from broadband-enabled applications and services? If so, how?

Over 90% of community champions and business partners consulted by the study, as noted below in Table 4-14, indicated that broadband has definitely increased or increased the capacity of individuals and organizations to use and extract value from broadband enabled applications and services. The average score for First Nations communities and non-First Nations communities (community champion interviews and survey combined) is the same at 4.5.

Table 4-14: In your view, has your Broadband Pilot Program Project increased the capacity of individuals and organizations to use and extract value from broadband enabled applications and services?

Score	Community Champion Interviews	Community Champion Survey	Vendor / ISP Interviews	Total	Percent
1 – definitely not increased	0	0	0	0	0%
2 – has not increased	0	0	0	0	0%
3 – neither has not/has	1	2	0	3	7%
4 – has increased	1	11	2	13	33%
5 – definitely has increased	9	8	9	26	60%
Total	11	21	11	43	100%
Average Score	4.7	4.3	4.8		

As noted earlier in Section 4.2, Table 4-5, email is ranked as the most important application, followed by research and downloading files. Three applications were ranked third: e-banking, distance education and CAP (community access program) centres. After research, online banking was cited as the most widely used broadband enabled application. As one community champion noted, “with broadband, you can still be on the farm and do your banking. I would say this has really increased capacity of people. It is a big issue if you have to travel 30 km to get to the nearest bank, and it’s much easier if you can do it from home”. Another community champion noted, “as people start using broadband, they become more familiar with it, discover other possibilities, they are starting to realize the full potential of broadband”.

Capacity has been increased through greater use (as noted above) and through training programs typically offered/organized by the community champion organization. One community champion summarized the situation by noting that, “this is brand new technology. There is a training aspect that is needed. Kids pick it up easy, but (with) older people and seniors, it’s difficult for them. Business owners and community leaders knows it’s powerful (broadband), but don’t know how to use it”. A First Nations community champion indicated that, “the Band

office set up a computer training centre, similar to a CAP site. We set up an Internet café for people to use, learn how to use the technology”.

4.9 Increased Business Opportunities

Has the Broadband Pilot Program led to increased business opportunities for local ICT and other companies? If so, what has been the general nature of such opportunities?

Most community champions reported increased business opportunities; 73% of community champion interviewees and 67% of community champion survey respondents. Interviewees were asked to elaborate on the type of business opportunities. They are as follows:

- Over half indicated that existing businesses have expanded their services. As one community champion noted, “certainly tourism operators and B&Bs have seen immediate benefits from marketing, online processing and expanded services to clients. Much can be said for any business utilizing the Internet for selling, purchase, supply chain applications, banking, VPN applications, software testing, and remote monitoring. Many applications would not work with simple dial up access. To business “time is \$\$”, the requirement for speed is critical!!!”
- Four community champions indicated that having broadband led to some existing businesses deciding to remain in their community; of which two respondents noted that because of broadband, large firms decided to remain in their community; had they gone, it would have caused a huge increase in the number of unemployed. As one community champion noted, “a major rural manufacturer (200+ employees) indicated that considerations have been given to relocating facilities where more services are available. The R&D and Customer Service aspects of operating such as business were severely hampered by the lack of high speed access”.
- One community champion indicated that new businesses had decided to locate in their community after they had received broadband.
- One reported that two new online businesses had been created in his community.
- Three community champions reported no increase in business opportunities.

The nature of the new business opportunities included: lower marketing costs, being able to buy and sell online, and having broadband made it feasible/practical for people to set up home based businesses either to supplement their income or as stand alone businesses. Many indicated that broadband is vital for tourism-based businesses.

Six of the users consulted by the study run a home based business/work out of their home. Broadband has made their business more efficient (e.g., being able to conduct research on the Internet, download large files at a faster rate) and reduced costs (e.g., reduced mailing costs, reduced travelling costs to urban areas). One user indicated that he is self-employed and owns three businesses, and having broadband has made it easier for him to run these businesses. He now files his taxes online, he can download necessary programs as opposed to ordering them in the mail and waiting 1-2 weeks for delivery, and marketing is much easier and cheaper by email and the web. Another user is a computer technician, who noted that broadband is vital to his work: upgrading computer systems from a distance, updating web sites, general information

searches, online banking, and online purchases. Two of the users consulted by the study are users who find doing their schoolwork much easier to do with broadband.

Other users consulted by the study work for a community based non-profit organization, public organization (e.g., municipality, school) or a firm (e.g., more than ten employees). One user noted increased business opportunities in his community; consisting of a tourism enterprise that now has increased its global business network, and the other being a retail business that is doing more online merchandising/purchasing.

4.10 Infrastructure Improved

Has the Broadband Pilot Program improved the physical communications infrastructure in some First Nations, Inuit and Métis, northern, rural and remote communities? If so, what has been the nature of the improvements?

The Broadband Pilot Program appears to have improved the physical communications infrastructure. As noted below in Table 4-15, 75% of community champions indicated that the quality of their Internet services has improved or significantly improved, 25% reported no change in quality, and none reported a decrease in quality. Several users and community champions indicated that what they liked most about broadband was they only needed one phone line, as opposed to two with dial-up. For communities with a cable and/or satellite connection, the telephone is sometimes down and having broadband gives them an alternate/back-up means of communication.

Table 4-15: Has the quality of your Internet services improved?

Score	Community Champion Survey	Percent
1 – significant decrease in quality	0	0%
2 – decrease in quality	0	0%
3 – neither a decrease nor increase in quality	5	25%
4 – increase in quality	8	40%
5 – significant increase in quality	7	35%
Total	20	100%
Average Score	4.1	

4.11 Improved Economic Opportunities

To what extent has the Broadband Pilot Program led to improved economic opportunities for First Nations, Inuit and Métis, northern, rural and remote communities? What has been the nature of such opportunities?

Two thirds of community champions that responded to the survey indicated that broadband has led to improved economic opportunities (score of 4 or 5), 10% felt that broadband had not led to improved economic opportunities (score of 2), and 24% were unable to determine if broadband had or had not led to increased economic opportunities, as noted in Table 4-16 below. Half the community champions interviewed indicated that on average 2-3 new home businesses had been set up since the introduction of broadband services. Most of these new home businesses were created by people already employed; the home business is intended to supplement their existing income. Two community champions indicated that their communities are embarking on promotional campaigns to attract organizations to the communities, and they are using broadband as part of their campaign.

Table 4-16: Getting access to and using broadband (high-speed Internet) has led to increased economic opportunities for people

Score	Community Champion Survey	Percent
1 – strongly disagree	0	0%
2 – disagree	2	10%
3 – neither disagree nor agree	5	24%
4 – agree	6	29%
5 – strongly agree	8	38%
Total	20	100%
Average Score	4.0	

All of the users consulted by the study felt that broadband has had a positive impact on their community, as noted in Table 4-17. Some, as noted earlier, have established home businesses in order to supplement their income, while others reported increased online buying and selling (e.g., e-Bay) now that they have broadband.

Table 4-17: The impact of getting broadband (high-speed Internet) on your community been generally positive

Score	Community Champion Survey	Percent
1 – strongly disagree	0	0%
2 – disagree	0	0%
3 – neither disagree nor agree	0	0%
4 – agree	2	18%
5 – strongly agree	9	82%
Total	11	100%
Average Score	4.8	

4.12 Sharing of ICT Best Practices

To what extent has the Broadband Pilot Program contributed to the sharing of ICT best practices within and amongst First Nations, Inuit and Métis, northern, rural and remote communities?

Two-thirds of community champions consulted by the study indicated that there has been a sharing of ICT best practices within and amongst their communities, while one-third indicated that there has not. As noted earlier in Section 4.3, the sharing of best practices has increased along with the greater degree of collaboration between communities. One community champion indicated that he was invited to be in Ireland (end February/early March 2006) to present his community's experience with the Broadband Pilot Program, as a model of public/private cooperation for broadband access.

4.13 Deployment of Broadband Facilities

To what extent has the private sector deployed broadband facilities in First Nations, Inuit and Métis, northern, rural and remote communities beyond local points of presence? How does the rate of deployment match original expectations in this regard?

Just over half of the business partners (vendors, ISPs) indicated that the rate of deployment of broadband facilities was above or significantly above expectations, 27% indicated that it was below expectations, and 18% indicated that it was at expectations (neither above or below), as noted below in Table 4-18.

Table 4-18: How does the rate of deployment compare with your original expectations?

Score	Vendor / ISP Interviews	Percent
1 – significantly below expectations	0	0%
2 – below expectations	3	27%
3 – neither below nor above expectations	2	18%
4 – above expectations	3	27%
5 – significantly above expectations	3	27%
Total	11	100%
Average Score	3.5	

Smaller, locally owned ISPs tended to report that the rate of deployment was higher than original expectations. One ISP indicated that they are a very small company with an ear to the community. The ISP cited the example of a small town which “if you blink, you will miss it”. They had expected 19 users but actually got 50 broadband users. A small wireless vendor indicated that they were expecting 1-2 ISPs per access point, and although they still have some access points without any ISPs, they only just finished in the winter. They have had several inquiries from other ISPs about getting connected. Now that spring is here, they are expecting the rate of deployment to increase. Another small vendor expected broadband to be deployed beyond local points of presence in the future. Factors behind the increased rate of deployment include: pent up demand, people want what others have, effective promotional efforts.

Some of the reasons cited for delays in the rate of deployment include: severe winter weather (they suggest not building in winter in future), changes in the Broadband Pilot Program contracting rules, equipment shortages, the terrain (e.g., for wireless, areas with heavy tree cover will take longer). A large vendor noted that, there are significant cost barriers to deploy broadband in rural areas to the service node (or local points of presence). Enhancements to the last mile connectivity (e.g., fibre-to-the-home architectures) would be cost prohibitive in these rural demographics even under joint funded programs within the foreseeable future.

4.14 Canada as a World Leader

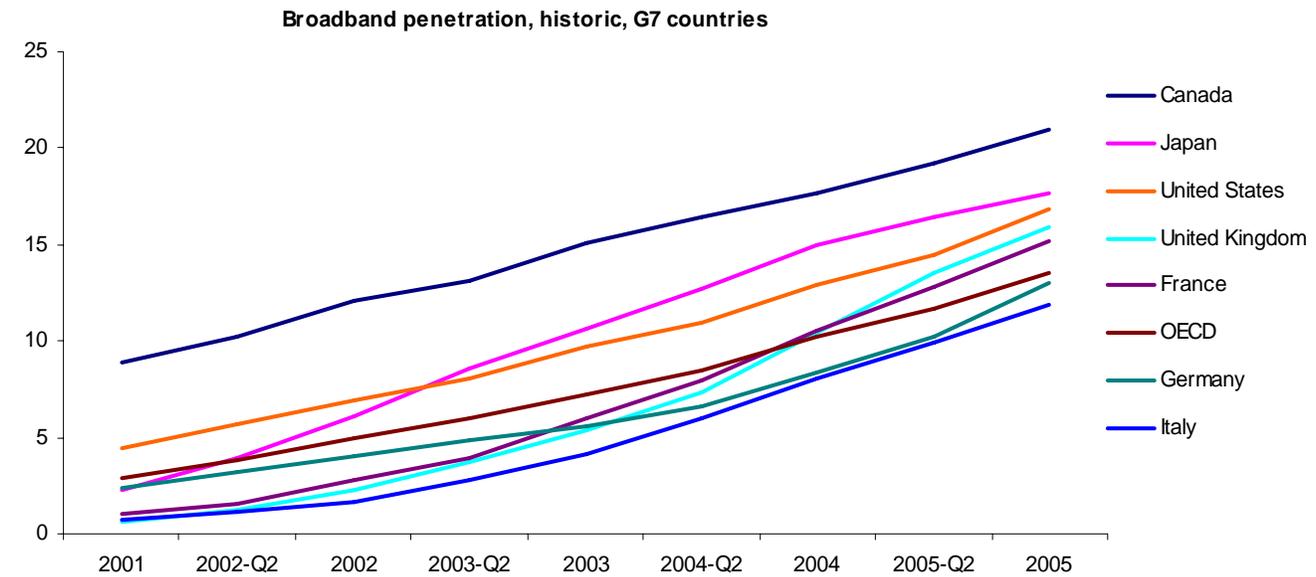
Has the Broadband Pilot Program contributed to increasing awareness, both domestically and internationally, of Canada as a world-class leader in the use of high-speed communications networks? If so, how?

According to the Organisation for Economic Cooperation and Development (OECD), Canada is ranked eighth in the world in terms of the number of broadband subscribers (21 per 100 inhabitants), as noted below in Table 4-19. Canada’s rank, however, has been on a declining trend, slipping from second in the 2001-2003 period, to fifth in 2004, and then to eighth in 2005.

Table 4-19: Broadband Subscribers per 100 Inhabitants by Country

	Broadband Subscribers per 100 Inhabitants, 2001-2005					Rank				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Australia	0.9	1.8	3.5	7.7	13.8	18	19	20	21	17
Austria	3.6	5.6	7.6	10.1	14.1	9	10	13	15	16
Belgium	4.4	8.7	11.7	15.5	18.3	5	3	6	7	10
Canada	8.9	12.1	15.1	17.6	21	2	2	2	5	8
Czech Republic	0.1	0.2	0.5	2.5	6.4	24	27	26	25	24
Denmark	4.4	8.2	13	19	25	5	5	4	2	4
Finland	1.3	5.5	9.5	14.9	22.5	14	12	11	9	6
France	1.0	2.8	5.9	10.5	15.2	16	16	14	13	14
Germany	2.3	4.1	5.6	8.4	13	10	14	15	17	18
Greece	0	0	0.1	0.4	1.4	27	28	30	30	30
Hungary	0.3	0.6	2	3.6	6.3	22	23	23	23	25
Iceland	3.7	8.4	14.3	18.2	26.7	8	4	3	4	1
Ireland	0	0.3	0.8	3.3	6.7	27	24	24	24	23
Italy	0.7	1.7	4.1	8.1	11.9	19	20	19	19	19
Japan	2.2	6.1	10.7	15	17.6	11	9	7	8	11
Korea	17.2	21.8	24.2	24.8	25.4	1	1	1	1	2
Luxembourg	0.3	1.5	3.5	9.8	14.9	22	22	21	16	15
Mexico	0.1	0.3	0.4	0.9	2.2	24	24	27	28	28
Netherlands	3.8	7	11.8	19	25.3	7	7	5	2	3
New Zealand	0.7	1.6	2.6	4.7	8.1	19	21	22	22	22
Norway	1.9	4.2	8	14.8	21.9	13	13	12	10	7
Poland	0.1	0.3	0.8	2.1	2.4	24	24	24	26	27
Portugal	1.0	2.5	4.8	8.2	11.5	16	17	18	18	21
Slovak Republic	0	0	0.3	1	2.5	27	28	28	27	26
Spain	1.2	3	5.4	8.1	11.7	15	15	16	19	20
Sweden	5.4	8.1	10.7	14.5	20.3	3	6	7	11	9
Switzerland	2.0	5.6	10.1	17.5	23.1	12	10	9	6	5
Turkey	0	0	0.3	0.7	2.1	27	28	28	29	29
United Kingdom	0.6	2.3	5.4	10.5	15.9	21	18	16	13	13
United States	4.5	6.9	9.7	12.9	16.8	4	8	10	12	12
OECD	2.9	4.9	7.3	10.2	13.6					
EU15	1.6	3.4	5.9	9.7	14.2					

When compared to the G7 countries, however, Canada has consistently ranked first in terms of the number of broadband subscribers per 100 inhabitants, as shown below in Table 4-20.

Table 4-20: Broadband Penetration, G7 Countries, 2001 to 2005

An international survey of advanced networks conducted by HAL, as part of an evaluation of CA*net 4¹¹ for CANARIE, found that Canada and the Netherlands are acknowledged as the world leaders in advanced networking, including user controlled lightpaths. The combination of Canada's geography (Canada is the second largest country in terms of area), leading edge activities such as CA*net 4, and universal access activities such as Smart Communities and the Broadband Pilot Program have contributed to Canada being recognized as a world leader in the use of high-speed communications networks.

4.15 Increased Awareness of Benefits

Has the Broadband Pilot Program led to an increased awareness of the benefits to communities of high-speed access? If so, what are the most commonly cited benefits?

As noted below in Table 4-21, 79% of community champions consulted by the study indicated that the Broadband Pilot Program has led to an increased awareness of the benefits of high-speed Internet (score of 4 or 5), while 22% neither agreed or disagreed with the statement. The average score for First Nations and non-First Nations communities was identical at 4.2.

¹¹ CA*net 4 is a high-speed (10 Gbps) optical network accessible in all regions of Canada, linking research partners nationally and internationally. CA*net 4 interconnects the provincial research networks through 19 points of presence; at least one per province plus Ottawa, and three exchange points in the US. The CA*net 4 architecture is designed as a "customer empowered network" through the creation of a system of "lightpaths". These high bandwidth, private connections place dynamic allocation of network resources in the hands of end users and give users the ability to innovate in the development of network-based research and applications.

Table 4-21: Awareness of the benefits of broadband (high-speed Internet) has increased as a result of our Broadband Pilot Program project

Score	Community Champion Interviews	Community Champion Survey	Total	Percent
1 – strongly disagree	0	0	0	0%
2 – disagree	0	0	0	0%
3 – neither disagree/agree	1	6	7	22%
4 – agree	4	8	12	38%
5 – strongly agree	6	7	13	41%
Total	11	21	32	100%
Average Score	4.5	4.0	4.2	

The most commonly cited benefits include:

- Broadband is vital for business, especially tourism, just to remain competitive (be on an even footing) with businesses in urban centres.
- Being able to do banking at a distance, and buy and sell goods online.
- Improved access to government services and information, e.g., filing taxes, and completing other government forms.
- Being able to conduct research on the Internet and downloading large files for work and/or school/education.
- Decreased costs, no longer needing two phone lines.
- Being able to conduct research on the family’s genealogy, cited by many seniors in the community. Related to this is being able to receive pictures, e.g., of one’s grandchildren.
- Being able to stay at home/in the community while taking courses at a distance, such as to complete high school.
- Building local knowledge, preserving culture, community history
- Avoided travel for health care.
- Having broadband can attract people, especially health professionals. Or to look at it the other way, if a community does not have broadband, people are less likely to locate/live in the community.
- Being able to keep in touch with family, friends and business colleagues.

As several community champions and users noted, broadband is essential today. “Broadband is very important if we want to keep up with everyone else. We need every tool we can get”.

5.0 Program Delivery

5.1 Alternative Means to Deliver

Are there alternative means to deliver the Broadband Pilot Program which are more efficient?

Of the two major delivery alternatives, leave it to the market or provide government assistance, there is unanimous consent amongst project representatives (community champions, project managers) and business partners (vendors, ISPs) that providing government assistance is the most appropriate means for delivering broadband services to rural and remote communities where, without government funding, an insufficient business case exists. As noted earlier, there is no business case for the private sector to provide broadband services to the rural and remote communities covered by the Program. As noted in Table 5-1, 94% of community champions and vendors/ISPs indicated that the Broadband Pilot Program (government assistance) is an appropriate way for rural and remote communities to get access to broadband. There were no differences in the average scores between First Nations and non-First Nations communities.

Table 5-1: The Broadband Pilot Program is an appropriate way for rural and remote, including First Nations, Inuit and Métis, and northern, communities to get access to broadband (high-speed Internet)?

Score	Community Champion Interviews	Community Champion Survey	Vendor / ISP Interviews	Total	Percent
1 – strongly disagree	0	0	2	2	5%
2 – disagree	0	1	0	1	2%
3 – neither disagree nor agree	0	1	1	2	5%
4 – agree	4	5	3	12	27%
5 – strongly agree	7	14	6	27	61%
Total	11	21	12	44	100%
Average Score	4.6	4.5	3.9	4.4	

One community champion summed up the challenge with using public funds to provide broadband services where market failures exist, by noting that, “the fact that ‘public funding’ has been invested to provide extremely important services to the most rural and remote regions of the country a great deal of the lasting benefit and profit will end up with the third party providers. The Broadband Pilot Program has been a major investment and at the end of this, major corporations are now owners of millions of dollars worth of infrastructure and albeit that the community is the beneficiary of high speed services (that hopefully continue to be up to par and continue to be maintained) there is some unfairness in that the major corporation continues to reap profits without any “real” commitment to continue to invest in the community. Measures should have been put in place to make this a requirement of the providers”.

Nine community champions who had applied to other federal/provincial/territorial government broadband/Internet programs responded to the question of how the Broadband Pilot Program compared to these other programs. As noted in Table 5-2, 44% (4 of 9) felt that other government programs were better than the Broadband Pilot Program, 33% (3) felt that the Broadband Pilot Program was better than the other programs, and 22% (2) felt that both the Broadband Pilot Program and the other programs were similar. As one community champion noted, “The provincial grant we received was much easier to manage and they are way easier to get along with, in terms of wanting to help instead of building further roadblocks”.

Table 5-2: If yes, the Broadband Pilot Program is much better than the other programs

Score	Community Champion Survey	Percent
1 – strongly disagree	2	22%
2 – disagree	2	22%
3 – neither disagree nor agree	2	22%
4 – agree	3	33%
5 – strongly agree	0	0%
Total	9	100%

Many community champions noted that the design of Broadband Pilot Program was good, just the delivery was poor. Compared to other programs, the Broadband Pilot Program was “overly managed” with rules being developed or changed after the business plan had been approved. As one community champion noted, there was “way too much bureaucratic red tape and make work projects for project officers. We never anticipated the overwhelming demand for paperwork and our human resources time”. Another community champion noted, “le seul point faible de ce programme c'est la lenteur du processus”. The list of “over managed” items cited by community champions are as follows:

- Business Plan was prepared according to program criteria and was accepted by selection committee; yet many changes were requested within the negotiation process primarily to the budget but also to other areas of the plan.
- “Cookie Cutter” approach was used for the Contribution Agreement and Third Party Agreement documentation making it very difficult for the community champion to have autonomy or control over the final document for the project. As a community champion and a “go between” two giant organizations (Telco and Federal Government) resources were extremely taxed over and above the day-to-day mandate of the local organization.
- Some sections of the documents (agreements) were decided by the Broadband Pilot Program with no input or comment from community champion – but yet some sections had major impact on the community champion – e.g., “investment clause”.
- A lot of new criteria were added after the project (phase 2 implementation) had been approved. Some community champions in round two had spoken with community champions from round one, and in their view, the reporting requirements increased greatly with the second round.

- There should have been an allowance for the time spent on the project by community champions. They are non-profit and have to work on projects that help sustain their operations. It was great for the community but was a strain time and resource-wise on the organization.
- Several occasions submitted documents were changed at no notice to the community champion – making it very difficult to maintain project management processes – e.g., milestone dates were changed without notice to community champions, resulting in mis-information for reporting etc., and budget changed in summer of 2004 – including removal of in-kind to labour costs. Changes to allocations to each funding partner – these changes caused several problems – for phase 2 budgeting.
- Milestone dates and activities were decided by the Broadband Pilot Program and the vendor with the community champion being the “fall-guy” when things did not work out.
- Community champion – little to no recourse when service provider does not meet requirements of agreement – particularly relating to meeting schedule dates. The only recourse is withhold of payment – which is really no issue for major corporations.

Other programs cited by community champions were top down, with governments making direct investments in the infrastructure. While this is perhaps a more efficient approach, in terms of less administration, most community champions preferred the bottom-up, community driven approach of the Broadband Pilot Program.

Not surprisingly, as noted in Table 5-1, vendors (particularly large suppliers) prefer the top-down, government-vendor approach. Several vendors indicated that the amount of paper work associated with the Broadband Pilot Program is excessive for a venture that is not profitable to them, or does not bring the same returns as urban and more populated regions. One vendor noted that it is far more efficient to negotiate one agreement with the government to deliver broadband services than to negotiate several agreements with communities to cover the same area.

Representatives of unserved communities (those that had received phase 1 but not phase 2) were extremely critical of the Broadband Pilot Program. The major criticism being the lack of transparent decision criteria. Many were never given reasons why their (phase 2) proposal had not been approved, and two were informed that they needed a private sector partner (both had proposed a community-owned solution). Two suspected that the reason their proposal was turned down was due to a wrong impression that their community was adequately served. They noted that while it is true that major towns in their region have broadband, neighbouring rural areas do not, and still do not have broadband services.

Community champions who indicated that the Broadband Pilot Program was better than other programs would have preferred more support from the Broadband Pilot Program, particularly with respect to negotiating the agreement with the vendor. They noted that they would have liked to benefit from Industry Canada’s expertise when negotiating the agreement with the vendor. The concern was that the communities might overlook or not understand the full technical and/or legal implications of the agreement. Those that would have preferred more

support from the Broadband Pilot Program tended to be from more remote communities, e.g., only accessible by boat or plane.

Many community champions, however, irrespective of what they thought of the Broadband Pilot Program's delivery or if they were from an unserved community, praised the regional officers for their professional assistance and support. As one community champion noted, "we had an excellent project officer from Industry Canada, he made things easier because he was very knowledgeable and informed, and if he didn't know the answer he was able to find it out quickly".

5.2 Last Mile of Connectivity

Has the Broadband Pilot Program been an effective means of encouraging the deployment of high-speed networks past local community points of presence and into residences and businesses in First Nations, Inuit and Métis, northern, rural and remote communities?

The Broadband Pilot Program has been an effective means of encouraging the deployment of broadband into residences and businesses. As noted earlier, there is no business case for the private sector to have provided broadband services to the 896 rural and remote communities that were supported by the Broadband Pilot Program. Had it not been for support from the Broadband Pilot Program (or other government programs), these communities would still be without broadband service. As noted in Section 4.4, one vendor is already adding capacity to the broadband network to accommodate the demand that has already taken place since the roll-out; in Section 4.10, 75% of community champions indicated that the quality of their Internet services have improved or significantly improved; in Section 4.13, smaller, locally owned ISPs tended to report that the rate of deployment was higher than original expectations.

The findings noted earlier in Section 4.15 are an indication that broadband has been deployed into residences and businesses, and is being used for their benefit. As one community champion noted, "in the short time that we have had broadband services many community and business services have changed in effort to be more cost and time efficient. The new processes are totally dependent upon access to broadband services. New online applications have been developed and implemented that also rely upon high speed services. Local health, justice and education services have also come to rely on broadband services for video conferencing and would be jeopardized if broadband services were suddenly lost. Broadband services are playing and will continue to play an increasingly important role within (our) communities. It is offering opportunities to develop social and economic initiatives that will help (our region) to strengthen its sustainability".

5.3 Leveraging Resources

How effective has the Broadband Pilot Program been at leveraging resources from partners and stakeholders?

The Broadband Pilot Program has been effective at leveraging resources from partners and stakeholders. The Program was designed to provide 50% of the costs, but, as noted below in Table 5-3, it has leveraged slightly more resources than planned. The Broadband Pilot Program actually leveraged 55% of total project costs. Within these leveraged resources, community champions, provincial governments, regional development agencies and municipal governments contributed 22.5% of total costs. Service providers covered 29% of total project costs.

Table 5-3: Matching Contributions to 59 initial Broadband Pilot Program Projects

Type of Contribution	Total Amount Contributed	Percentage of Total Project Costs
Service Provider	\$50,715,364.00	29.09%
Community Champion	\$15,005,824.35	8.61%
Provincial Government	\$10,356,502.00	5.94%
Regional Development Agency	\$8,371,378.00	4.80%
Municipal Government	\$5,585,082.00	3.20%
Federal Government (non-RDA)	\$3,364,584.00	1.93%
Federal / Provincial Initiative	\$2,524,069.00	1.45%
Institution	\$287,946.00	0.17%
First Nations	\$119,687.00	0.07%
Private Company	\$27,000.00	0.02%
Total Contributions	\$96,357,436.35	55.28%
Total BRAND Contributions	\$77,961,682.35	44.72%
Total Project Costs	\$174,319,118.70	100.00%

Although the Program leveraged resources from partners and stakeholders, 43% of community champions indicated that they experienced difficulties in satisfying the matching funding requirement of the Program, 28% had no difficulty in satisfying the matching funding requirement, and 29% neither agreed nor disagreed with the matching funding requirement statement, as noted below in Table 5-4. The average score for First Nations communities at 2.9 was slightly lower than non-First Nations communities' average score of 3.3. As one community champion noted, "money is always an issue in northern communities, there isn't any. Matching funds was a challenge".

Table 5-4: There were no difficulties in meeting the matching funding requirement

Score	Community Champion Survey	Percent
1 – strongly disagree	4	19%
2 – disagree	5	24%
3 – neither disagree nor agree	6	29%
4 – agree	4	19%
5 – strongly agree	2	9%
Total	21	100%
Average Score	3.3	

5.4 Participating in the Networked Economy

How effective has the Broadband Pilot Program been in providing a means for Canada's First Nations, Inuit and Métis, northern, rural and remote communities to participate in the Networked Economy?

The Broadband Pilot Program has been effective at providing a means for rural and remote communities to participate in the Networked Economy. As noted earlier in Section 4.2, the most important activities are education and economic development, with community access, health and employment each ranked third, and the most important broadband enabled applications/services are email, research and downloading files, and e-banking, distance education and CAP (community access program) centres each ranked third; 85% of users indicated that their use of/reliance on the Internet has increased significantly since getting a high-speed connection; in Section 4.4, the proportion of households owning a computer and using broadband is expected to increase in the future; in Section 4.6 broadband is increasingly being used for education and health; in Section 4.7, broadband is contributing to the sustainability of rural and remote communities; in Section 4.8, the capacity of individuals to use and extract value from broadband enabled applications and services has increased; in Section 4.9, there are more business opportunities; in Section 4.10, the physical communications has improved; in Section 4.11, there are more economic opportunities; and in Section 4.17, the findings indicate that the more people use broadband, the more they benefit from broadband.

5.5 Supports Sustainable Development

Does the Broadband Pilot Program decision-making support sustainable development? Is there systematic consideration of social, economic and environmental considerations in policy, program and project development decision-making?

A review of the phase 2 applications and the milestone reports of 15 projects completed as of November 2005 indicated that there is a systematic consideration of social, economic and environmental factors in the decision-making by project representatives and communities. As noted earlier, some project representatives excluded some communities from their submission to

the Broadband Pilot Program because it was felt they would not be able to meet the sustainability requirement of the Program, or were required to remove some communities by the vendor/telco. It would appear that the Broadband Pilot Program decision-making does require project representatives and communities to carefully consider sustainable development. It is, however, too early to determine if the Broadband Pilot Program decision-making supported sustainable development in the communities.

5.6 Factors Facilitating/Impeding Implementation/Delivery

What factors have facilitated/impeded the implementation/delivery of Broadband Pilot Program programming?

Three factors were examined regarding the implementation/delivery of the Broadband Pilot Program. They included: 1) meeting the sustainability criteria of the Program, 2) environmental assessment process, and, 3) the tendering process to select a vendor.

Most (58%) project representatives indicated that their communities experienced no difficulties in meeting the sustainability criteria of the Program, 10% experienced difficulties, and 33% neither agreed nor disagreed with the statement, as shown in Table 5-5.

- The two projects (10%) that experienced difficulties represent 24 communities, of which eight are First Nations communities. One of the projects is in BC and the other is in PEI.
- The seven projects (33%) that neither agreed nor disagreed with the “sustainability” statement represent 169 communities, of which 31 are First Nations communities. The seven projects are distributed across the country: 1 is in PEI, 1 is in NS, 2 are in QC, 1 is in ON, 1 is in SK, and 1 is in BC.
- Combined, the nine projects represent 193 communities, of which 39 are First Nations communities. This represents 37% of communities and 49% of First Nations communities that were supported by the Broadband Pilot Program. Thus, it would appear that First Nations communities tended to have a more difficult time meeting the sustainability criteria.

The average score by First Nations communities was slightly lower at 3.5 compared to non-First Nations communities with an average score of 3.8.

Table 5-5: There were no difficulties in meeting the sustainability criteria

Score	Community Champion Survey	Percent
1 – strongly disagree	1	5%
2 – disagree	1	5%
3 – neither disagree nor agree	7	33%
4 – agree	6	29%
5 – strongly agree	6	29%
Total	21	100%
Average Score	3.8	

As noted below in Table 5-6, 43% of community champions indicated that they experienced difficulties in meeting the environmental assessment requirements of the Program, 28% experienced no problems, and 29% neither agreed nor disagreed with the statement. The problem, according to the 43% that experienced difficulties is that an environmental assessment had to be completed by the Broadband Pilot Program before any funds could be disbursed. This prevented communities from undertaking any preliminary project-related work, or if they did, it caused a cash-flow problem. The average scores for First Nations and non-First Nations communities are identical at 2.8.

Table 5-6: There were no difficulties in meeting the environmental assessment requirements

Score	Community Champion Survey	Percent
1 – strongly disagree	4	19%
2 – disagree	5	24%
3 – neither disagree nor agree	6	29%
4 – agree	4	19%
5 – strongly agree	2	9%
Total	21	100%
Average Score	2.8	

As noted below in Table 5-6, 57% of community champions indicated that they experienced no difficulties in conducting the tendering/process of selecting a vendor/ISP, 24% indicated that they had experienced problems, and 19% neither agreed nor disagreed with the statement. The average score for First Nations communities at 4.1 is slightly higher than non-First Nations communities with an average score of 3.9.

Table 5-7: There were no difficulties in conducting the tendering/process of selecting a vendor/ISP

Score	Community Champion Survey	Percent
1 – strongly disagree	1	5%
2 – disagree	4	19%
3 – neither disagree nor agree	4	19%
4 – agree	7	33%
5 – strongly agree	5	24%
Total	21	100%
Average Score	3.9	

Three additional factors were cited by respondents regarding the implementation/delivery of the Broadband Pilot Program. They included:

- The additional burden placed on the community champion organization to respond to the administrative and reporting requirements of the Program. In many cases, the time required by the community champion/project manager was far greater than expected, which took them away from other community development activities.
- The technical expertise does not reside within the communities. Virtually all Broadband Pilot Program projects engaged consultants to assist them with developing and implementing the business plan. Some projects also relied on the consultants to assist them with the tendering and processing of selecting the vendor. Some representatives of unsuccessful phase 2 submissions believe that because there was a large demand for consultants at the same time, in order to meet the round 1 and 2 deadlines, those communities whose projects were approved by the Broadband Pilot Program were successful at engaging the better consultants.
- Examining the legal implications of the agreement between the communities and the selected vendor. Several community champions indicated that they would have preferred to rely on the advice of Industry Canada, which has the ICT expertise rather than the consultants.

Overall, as shown below in Table 5-8, the design and delivery of the Broadband Pilot Program was considered to be effective and efficient by half the respondents and ineffective and inefficient by the other half. The Broadband Pilot Program is considered to be effective and efficient by 60% percent of community champions of completed projects (interviews), 43% of community champions of ongoing projects (survey), and by 17% of business partners (vendors/ISPs) indicated that the most appropriate and efficient means were used. However, half felt that the Broadband Pilot Program was not designed and delivered in the most appropriate and efficient manner, by 50% of business partners (vendors/ISPs), 38% of community champions of ongoing projects (survey), and by 10% of community champions of completed projects (interviews).

The average score for First Nations communities is 3.7, which is identical to the average score for community champion interviewees (3.7), but higher than the average score for community champion survey respondents (3.0) and vendors/ISPs (2.3).

Table 5-8: The design and delivery of the Broadband Pilot Program is effective and efficient

Score	Community Champion Interviews	Community Champion Survey	Vendor / ISP Interviews	Total	Percent
1 – strongly disagree	0	4	4	8	19%
2 – disagree	1	4	2	7	16%
3 – neither disagree nor agree	3	4	4	11	26%
4 – agree	4	7	2	13	30%
5 – strongly agree	2	2	0	4	9%
Total	10	21	12	43	100%
Average Score	3.7	3.0	2.3	3.0	

The Broadband Pilot Program is appropriate and meeting a need, with broadband users and community champions of completed projects (interviews) strongly recommending that the Broadband Pilot Program be extended to other communities wishing to deploy broadband facilities and services, as noted below in Table 5-9. While the community champions of ongoing or recently completed projects (survey) would also recommend the Broadband Pilot Program to others, their endorsement was not as strong. It is perhaps a case of having to use/get some experience with broadband in order to realize its full potential and benefits.

Table 5-9: Would you recommend the Broadband Pilot Program to others wishing to deploy high-speed Internet in their communities?

Score	Community Champion Interviews	Community Champion Survey	BB User Interviews	Total	Percent
1 – strongly not recommend	0	0	0	0	0%
2 – not recommend	0	0	0	0	0%
3 – neither	1	6	0	7	16%
4 – recommend	0	6	0	6	13%
5 – strongly recommend	10	9	13	32	71%
Total	11	21	13	45	100%
Average Score	4.8	4.1	5.0	4.6	

Selected comments with respect to recommending the Broadband Pilot Program to others, are provided below:

- Oui s' ils ont une organisation capable de les soutenir financièrement et si ils ont de l'expérience avec ce genre de projet gouvernemental, si non, je ne le recommanderais pas puisque trop complexe.
- Yes, there is absolutely a continued need for the Broadband Pilot Program. It should be extended to communities yet to be served.
- As long as they have the time and personnel to manage the file. Honestly, it is grossly over administered.
- Make sure that they (the Broadband Pilot Program) know their goals, be clearer in the beginning on what they want reporting wise, and try not to change criteria and reporting requirements as it makes it difficult for us to stay within budget. Some type of contingency fund available to communities for unexpected things Industry Canada asks communities to do would be a good lesson learned.
- Providing high-speed access to communities is an expensive proposition, particularly for last mile solutions. Early estimates indicate that 80% of homes in (our province) have access to high speed, the incremental costs of servicing the next 5% to 10% would equal the investment of servicing the first 80%. I feel that more participation and leadership from our provincial partners will be crucial to achieving the goals of connecting all Canadians.
- Any help is good for projects of this magnitude, which makes the Broadband Pilot Program a necessity. Could be easier to deliver. In the future, Government should think about working directly with Telco, and imposing a local advisory committee to respect local needs and priorities. Also, projects of this nature should not be subjected to CRTC regulation, which in the end, is only delaying the rural communities' access to broadband.
- C'est un excellent programme pour la viabilité des régions rurales. Par contre, le processus est lourd et si nous demandons des changements pour l'adapter à notre région, la souplesse est difficile dû aux lourdeurs administratives. De plus, le service est non concurrentiel au service offert dans les grandes villes dû au norme du CRTC.
- I certainly would recommend the Broadband Pilot Program to other communities, but I would suggest to them that they put in a NSI (National Satellite Initiative) application at the same time.
- We would really like to participate in another round of the Broadband Pilot Program and get wireless service delivered to the unserved communities in our area.

All project representatives and business partners indicated that the easier communities have been served (the "low hanging fruit") by the Broadband Pilot Program and other programs. Communities yet to be served will represent a greater challenge. Community champions and business partners indicated that if the Broadband Pilot Program is extended to other communities, Industry Canada should address the delivery challenges noted earlier in Section 5.6.

Business partners (vendors, ISPs) were split on whether they would provide broadband services to other rural and remote communities yet to be served. Two-thirds of business partners indicated that they would be willing to go through the process again to provide broadband services to communities yet to be served, but this is conditional upon government subsidies, as noted below in Table 5-10. One-third of business partners indicated that they would not go through the process again, even if with government subsidies. The administrative burden placed on companies for a venture that is not profitable is not worth the time and effort.

Table 5-10: In future, what is the likelihood of your company providing broadband services to other rural and remote communities?

Score	Community Champion Survey	Percent
1 – very unlikely	2	22%
2 – unlikely	1	11%
3 – neither unlikely nor likely	0	0%
4 – likely	0	0%
5 – very likely	6	67%
Total	9	100%

Some community champions provided comments on lessons learned/recommendations for the future as follows:

- I'd like to see successful (and non) Broadband Pilot Program recipients share their stories and issues about the whole process sometime. I'd like to compare notes.
- I haven't heard one bad thing from anybody in the community. Only complaint is from communities not connected.
- The staff at Industry Canada provided excellent assistance and support, however, the amount of funding available overall was a severe handicap. The level and requirements of documentation and bureaucracy are greater than that experienced in other federal and provincial programs. We are a small organization but had access to technical support such as engineers and accountants, and I feel that a small organization without significant support services would have difficulty.
- This program must continue until Canada achieves universal national coverage. The business case for this may not exist to do this, but it must be done. If the program continues, there should be an additional focus placed on provided support to drive demand, and an applications fund created (e.g., tele-health) to encourage new applications of the service.

6.0 Conclusions and Recommendations

6.1 Extend Broadband to Unserved Communities

Most vendors and project representatives indicated that without government assistance there is simply no business case for providing broadband services to rural and remote communities. Some vendors commented that in theory, a few communities might have been provided with broadband in 2-3 years assuming that costs would continue to decline along with technological advances, but by that time, the gap between rural/northern and urban/southern communities (which have access to broadband) would be wider.

We conclude that the Broadband Pilot Program addressed a need that would most likely not have been provided if left to market forces. Furthermore, there are initial indications of positive social and economic impacts in the approximately 900 communities supported by the Broadband Pilot Program.

However, an estimated 2,000 communities still do not have access to broadband. *We recommend, therefore, that consideration be given to extending access to broadband services to a greater number of Canadian communities.*

6.2 Establish Committee to Coordinate all Broadband Initiatives

Two events within the last few weeks may affect how Industry Canada acts upon the recommendation to extend access to broadband services to all Canadian communities. First, on February 16, 2006 the Canadian Radio-television and Telecommunications Commission (CRTC) determined that initiatives 1) to expand broadband services to rural and remote communities and 2) to improve accessibility to telecommunications services for persons with disabilities would be appropriate uses of deferral account funds (approximately \$650 million) of incumbent local exchange carriers.¹² Second, in mid-March 2006, the Telecommunications Policy Review Panel released its final report recommending that “the federal government should reaffirm its commitment to maintaining Canada’s global leadership and to ensuring that broadband access is available everywhere in the country”¹³. As such, a number of the Panel’s recommendations are relevant to this evaluation:

- Recommendation 8-1 (b): the federal government should immediately commence a program to ensure that all affordable and reliable broadband services are available in all regions of Canada, including urban, rural and remote areas, by 2010 at the latest.
- Recommendation 8-3 (b): federal government policy should recognize that market forces will not on their own achieve the policy objectives of deploying ubiquitous broadband access by 2010, particularly in rural and remote areas.

¹² CRTC, Telecom Decision CRTC 2006-9: Disposition of Funds in the Deferral Accounts, Reference: 8678-C12-200402313 and 8678-B2-200318049.

¹³ Telecommunications Policy Review Panel, Final Report, March 2006.

- Recommendation 8-4: a specific, targeted government subsidy program, the Ubiquitous Canadian Access Network/Ubiquité Canada or U-CAN program, should be established to ensure broadband access is made available to Canadians in areas where commercial operators are not providing service and are unlikely to do so for economic reasons.
- Recommendation 8-5: The U-CAN program should aim to complete the job begun by the Broadband Pilot Program of providing ubiquitous broadband throughout all regions in Canada that the market is not likely to serve on its own by 2010.
- Recommendation 8-7: The U-CAN program should be flexibly designed and implemented to reflect the needs of stakeholders in regions to be served, including governments, communities and the private sector.

This evaluation concurs with the overall goal and spirit of the Panel's recommendations to provide affordable and reliable broadband services in all regions of Canada. *We therefore, recommend that Industry Canada establish and undertake a horizontal governance function in order to coordinate all initiatives – federal, provincial, and private sector (e.g., funds from the deferral accounts) – in order to avoid duplication of efforts, and to ensure that a greater number of Canadian communities are provided with access to affordable and reliable broadband services.*

6.3 Issues to Consider in Future Broadband Initiatives

Bottom Up Versus Top Down

It is interesting to note that over half the business partners (vendors, ISPs) indicated that the rate of deployment of broadband facilities was above or significantly above their expectations. There are several reasons for this. First, two-thirds of project representatives indicated that the Broadband Pilot Program contributed to greater collaboration amongst and within communities. This included the sharing of experiences and best practices. Second, many communities collaborated and submitted joint rather than separate proposals, which resulted in the Broadband Pilot Program supporting twice as many communities as originally expected; i.e., almost 900 communities as opposed to the original expectation of 400. Third, many communities realized positive social and economic benefits early on. Fourth, the capacity to use broadband enabled applications and services, such as distance education and electronic commerce (online business transactions), has increased. This has had a domino effect of increasing awareness of the benefits of broadband, which further increased the use of, and reliance on, broadband. We conclude that the bottom-up approach of the Broadband Pilot Program was the primary factor in the actual demand for broadband exceeding vendor's original expectations.

Although a top down approach provides some ease in administration, *we recommend that Industry Canada maintain a bottom-up approach in any future broadband initiative undertaken by the Department, in order to more fully realize the social and economic benefits of using broadband.* Where broadband initiatives are not the responsibility of Industry Canada, e.g., funds from the deferral accounts, *we recommend that the Department undertake best efforts to ensure that local needs are taken into consideration, such as creating a local advisory committee to the vendors.*

Matching Funds and Sustainability

Several factors were examined pertaining to the implementation/delivery of the Broadband Pilot Program. Providing matching funds and meeting the sustainability criteria was a challenge for roughly 40% of the communities; of which 10% (or one-quarter of the 40%) of communities expect to continue experiencing difficulties in sustaining broadband services. A greater proportion of First Nations communities found the matching funds and sustainability requirements to be a challenge. While there are clearly benefits from broadband, the difficulty with subsidizing O&M costs is the ongoing commitment (e.g., no end date), whereas subsidies on capital costs can be provided over a fixed period of time (e.g., specific end date).

With respect to matching funds, which represents a subsidy on capital costs, *we recommend that, on a case-by-case basis, Industry Canada consider decreasing the amount of funds that communities have to match on any future broadband initiative undertaken by the Department; i.e., Industry Canada should increase the amount of subsidy on capital costs.*

With respect to sustainability, which would represent a subsidy on O&M costs, *we recommend that Industry Canada continue with its policy of only subsidizing capital costs, i.e., Industry should not subsidize O&M costs on any broadband initiative undertaken by the Department.*