INDUSTRY CANADA
BROADBAND ECONOMIC IMPACT STUDY
FINAL REPORT

August 2005

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Industry Canada Broadband Economic Impact Study
Final Report

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The opinions expressed in this document are those of the report authors.

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Forward

The findings presented here provide an economic impact assessment of broadband in the communities of Churchill, MB and Parrsboro, NS. The purpose of this report is to assess the economic impacts associated with broadband access among businesses and organizations.

Section 1 presents an introduction to the project and the study objectives. Section 2 is a discussion of the methodology that was employed in the assessment. Section 3 and 4 provide findings for each of Churchill and Parrsboro. Section 5 presents a comparison of the study findings in each community and a summary of the overall findings. Conclusions and recommendations are presented in Section 6. This section also includes a brief discussion of recommendations for future broadband economic impact assessment studies.

Executive Summary

This Report provides information on the economic impacts of broadband access and usage in two small Canadian communities, located in Manitoba and Nova Scotia. The information was gathered primarily from a multiple round of basic telephone surveys followed up by a smaller series of more detailed interviews. A small workshop was held in Parrsboro NS to gain greater depth into the community and business impacts of acquiring broadband access. Remoteness and cost prevented the study team from doing a similar workshop in Churchill MB.

The situation differs widely between these two small communities with respect to broadband access. A community group in Churchill managed to gain broadband access in 2003, after having had dialup access for a number of years before. The entrance of the telephone company into the area with inexpensive dialup service only led to the collapse of the community group and its broadband connection in May 2005. In Parrsboro, the BRAND program at Industry Canada, the Town of Parrsboro and the local Cumberland Regional Economic Development Agency collaborated to bring the telephone company's broadband service into the community in November, 2004, now followed by the introduction of cable broadband. One community is more experienced than the other with the technology, while one has gained two broadband sources as the other has lost its connection.

A summary of the impacts for both Churchill and Parrsboro have been illustrated below:

Comparative Statistics on Broadband Impact

Broadband Impacts	Churchill	Parrsboro
Revenue Impacts	• $769,000 in revenue generated online by businesses using broadband. • $4,200 decrease in revenue as a result of the lack of broadband	$58,000 from Internet sales and reservations by businesses using broadband
Cost Impacts	• $32,000 decreased printing and postage • $32,400 increase to re-establishing high-speed connection	$37,100 cost savings from reduced travel, reduced postage, and new markets (JA)
Employment Impacts	• 2.7 FTE jobs retained • 4.0 FTE jobs outsourced as a result of loss of broadband	0.5 FTE jobs retained

The study team, made up of people from Brandon University, Dalhousie University and SNG Inc. notes that there is a 'digital divide' in Canada that separates businesses in rural and remote communities from being able to play on an even field with their competitors that have access to broadband. Whether it is the family farm that cannot deal with e-government files and forms or the B&B that loses customers because there is no broadband access for them or the tour company or theatre that cannot sell efficiently over the internet, all are kept from operating as productively as they might otherwise. The critical impact that came through all of the research was that of job, company and community retention. Overall, the return on investment of broadband on Churchill and Parrsboro has been positive and respondents strongly support future investments in broadening access to ICT and broadband

Table of Contents

Table and Figures

1.0 Introduction and Study Objectives

The Government of Canada is faced with the challenge of reducing or eliminating what has been termed 'the digital divide', a discrepancy in Information & Communications Technology [1](ICT) use and capability between urban and remote or rural areas. In order to bridge 'the digital divide', Industry Canada has invested in ICT and broadband [2]technology for these rural and remote regions through the BRAND[3], CAP[4] and Smart Communities Programs. However, to support making further investments in broadband and ICT, it is necessary to justify expenditures that have already been made and demonstrate the economic rationale for further investment.

Factual proof of broadband benefits is needed but is often difficult to quantify, and despite limited resources and budgets there is an increasing pressure to demonstrate results. Furthermore, investment decisions are made easier when they can be assessed in terms of return on investment (ROI) to the local economy. Industry Canada must overcome this challenge by providing feedback on the achievements of investments in broadband and ICT in terms of return on investment to the community and region.

From a university perspective, researchers want to understand the challenges of bridging the digital divide, especially in rural and small towns across Canada. Whether in urban or rural areas, e-commerce tools are vital to companies. In particular, if affordable broadband is not available to businesses in rural areas, there is pressure on them to move to urban areas in order to survive, taking their employees with them – further depopulating the rural areas with economic and social spin offs. The collective experience and resources of the research consortium will assess whether introducing affordable high-speed Internet into a rural area:

- Has had an impact on the local economy,
- Affects the urbanization trend of rural businesses moving to cities, and
- Can be leveraged as a tool for rural economic development by government agencies.

The impact study will also try to assess whether such broadband investment projects can demonstrate a positive ROI to the community and to the government. This project applies the ROI Framework[5] to track impacts of broadband to Churchill, Manitoba and Parrsboro, Nova Scotia. This will include:

- New broadband users, including new business broadband users,
- New business opportunities that may be linked to the project, and
- New revenues, cost savings / avoidances, new jobs created, etc., experienced by local businesses because of their access to broadband.

The findings from these studies will also be shared within the local community to further raise local awareness and promote skills development so that residents have the knowledge and capacity to leverage as much as they possibly can from ICT and broadband.

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[1] Information Communication Technology (ICT) – infrastructure, equipment, applications and services that enable electronic communication and sharing of information.

[2] Broadband is defined as 'always on' Internet access greater than 1 Mb/s via technologies that include digital subscriber loop (DSL), cable, wireless, and T1.

3 BRAND – Broadband for Rural Access and Northern Development

4 CAP – Community Access Program

[5] ROI Framework developed by SNG defines the social and economic benefits resulting from a community of broadband users.

1.1 Study Objectives

The project will develop a case study that documents the local economic development impacts realized to date in Churchill and Parrsboro from their experiences in employing broadband networks. The purpose of this study is to:

- Describe broadband access in the study area,
- Describe the effects of the broadband network on organizations in the study area, and
- Provide unbiased economic analysis of the impacts to add to the evidence base for broadband.

The intended audience for this case study falls into two groups:

- Managers and staff with government programs and agencies responsible for promoting broadband infrastructure rollout who need models that identify what types of costs and benefits communities and regions should expect, and
- Businesses and consumers that would benefit from broadband and need examples on the costs and benefits of investing in broadband.

The challenge for the audience mentioned above is that they have had little 'hard' evidence on the effects of broadband and how these effects translate into economic impacts and dollar values. This information will provide community leaders, such as councilors and business owners, with a model that identifies the costs and benefits of broadband along with key metrics. With a better understanding of what kinds of costs and benefits can be expected, decisions to invest in broadband infrastructure are made easier – especially when they can be assessed in terms of increases in sales, employment and government tax revenues.

1.2 Project Methodology

The approach that we are applying in our research to determining the above effect is based on both contextual evidence and measurable economic impacts accruing to the communities of Churchill and Parrsboro through broadband.

The applied methodology is based on Strategic Networks Group's (SNG) [6] tested approach to evaluate and measure community level economic impacts from broadband. Its approach has been developed over a number of years and includes the following core elements:

- Background Research and Orientation, comprised of:
  - document research
  - high level interviews
- Survey Development, which includes:
  - development of a telephone based survey
  - survey pre-test and review
  - development of survey target list
  - survey deployment and data collection
- Broadband User Interviews
  - development of interview list
  - data collection from broadband users
- Data Analysis
  - coding/cleaning

[6] See www.sngroup.com for further details on evaluating and measuring community level economic impacts from broadband, as well as other studies on the socio-economic impacts of broadband.

- analysis and reporting

Detailed analysis of telephone survey responses indicated businesses that reported broadband impacts. These findings were used to develop the list of organizations to contact for follow-up interviews. The follow-up interviews helped to determine whether identified impacts were attributable to broadband introduction and to quantify those impacts in economic terms where possible. As well, the follow-up interviews explored in greater depth the ways in which businesses have, or have not, benefited from broadband in their operations.

1.3 Report Organization

This Report is organized in the following sections:

- **Section 1** – "Introduction and Study Objective" provides an overview of the purpose of the study, the desired output, the scope of the activity, and methodology overview.
- **Section 2** – "Research Methodology" provides an overview of the research methodology quantifying the economic impacts of broadband in the communities under study.
- **Section 3 & 4** – "Study Findings" presents the results and analysis of the research into broadband impacts for Churchill, Manitoba, and Parrsboro, Nova Scotia, respectively.
- **Section 5** – "Community Comparisons and Summary" presents the significant similarities and differences between the two communities under study with an overall summary of broadband impacts.
- **Section 6** – "Conclusions and Recommendations" presents the significant conclusions and recommendations summarized from the research and analysis, and recommends directions in which these outputs may be further developed and applied.
- **Appendices** – Additional details of literature review references and survey results for both communities are included in the appendices.

Please note that the terms "broadband" and "high-speed Internet" are used interchangeably in this report. For survey purposes the term high-speed Internet was used since this is terminology more familiar to users. Therefore, questions and response statistics resulting from the survey use this terminology.

2.0 Research Methodology

This section describes the research methodology applied by the research team. It includes the rationale for the methodology and describes its implementation.

The work steps within the category of background research include both primary and secondary research. Secondary research refers to existing information (documents, studies) and these are typically references to establish the context for the community that is being researched.

For Churchill, secondary information included a business directory from the local Chamber of Commerce, broadband Internet client lists from the Churchill Community Network (the local broadband provider), and recent Internet connectivity reports based on Churchill from the Manitoba Research Alliance on Community Economic Development in the New Economy and the Rural Development Institute. In the case of Parrsboro, secondary information sources included the pre-existing business directory that was used to administer the survey.

Primary research refers to community orientation through discussions with local community leaders, as well as the new data collection that occurs through surveys and interviews.

2.1 Literature Review

The literature reviews for both communities provided background information that created a better understanding of the communities, their local issues, and broadband developments. In Churchill, the community established broadband Internet services through the efforts of a local volunteer non-profit group. This group, Churchill Community Network (CCNet), first established dial-up Internet services (2000) and then broadband services a few years later in 2002. A unique characteristic of Churchill is that the provision of broadband services dissolved in June 2005 due to financial and human resource issues. Internet access has continued in the community through dial-up Internet services however. Due to Churchill's remote isolation and unique economy, which is largely based on tourism, many business owners have noted the absence of broadband services. This situation presents a unique opportunity to evaluate broadband impacts from the perspective of its loss to local businesses. The community is actively engaged in communications to re-establish broadband services in the community.

The establishment of broadband Internet in Parrsboro was conducted through Industry Canada's BRAND program. As part of the Cumberland Regional Economic Development Association (CREDA), the community of Parrsboro received broadband Internet services in 2004. Community members have described the development of broadband services in Parrsboro as an advantage in many sectors of the economy, such as manufacturing and real estate.

2.1.1 Summary – Churchill and Parrsboro

Both communities in this study are relatively small and remote. Churchill is more remote than Parrsboro in the sense that there are no significant surrounding communities and it is physically isolated with no external road access. It was, therefore, expected that Churchill organizations and businesses would receive even greater positive benefits from having access to the Internet and broadband services.

Internet users in Churchill have had access to broadband for 3 years, whereas Internet users in Parrsboro have had access to broadband for approximately 9 months. Therefore, the level of experience with broadband was expected to be different. In addition, Churchill no longer has broadband access available, providing a unique perspective of former users who have lost a valuable resource.

2.2 Broadband User Survey

The survey process is the core component of the research methodology because of its role in identifying socio-economic benefits from the individual businesses that report such returns. Generally, the survey of economic impacts of broadband Internet users covers the following topics:

- Tombstone information, such as organization name, address, and contact, and type of industry;
- Current and planned uses of computers, email and Internet;
- Current and planned type of Internet access;
- Business uses of the Internet;
- Business benefits received or expected from using the Internet;
- Barriers to buying and selling over the Internet;
- Organization web site and its uses;
- Business changes in past 12 months for jobs and expansion;
- Use of the Internet for communicating with customers and suppliers; and
- Advertising on the Internet.

The survey for both Churchill and Parrsboro included 22 closed ended questions (response options are predetermined categories from which the respondent makes a selection) and 3 open-ended questions (where the respondent is free to provide a response in their own words).

2.2.1 Survey Endorsement and Awareness

As a result of the interest and support from local stakeholders for both the Churchill study and the Parrsboro study, the research team obtained endorsements from high ranking organizations and officials in each study area. In the case of Parrsboro, the Cumberland Regional Economic Development Association (CREDA) and the Town of Parrsboro provided an endorsement of the survey supporting the study process. A similar endorsement was provided by Town of Churchill by the local Chamber of Commerce to their membership through both facsimile and e-mail.

As another form of awareness generation, the individuals within Churchill and Parrsboro who had provided support to our proposals to Industry Canada for this project also took the initiative to promote this study. In the case of Parrsboro, a representative of CREDA presented to the Parrsboro Town Council our research project and invited council and local business people to spread the word that this process was ongoing. CREDA also used this occasion to invite those contacted to participate in the process. A similar approach was followed in Churchill.

2.2.2 Assembly of Survey List

A list of all businesses and organizations within each community was assembled from information available from local resources. In the case of Churchill, this list was provided by the Churchill Chamber of Commerce based on the 2004 business directory and included a total of 60 businesses and local organizations. In addition to the business directory, the Churchill Community Network provided their former list of broadband subscribers. It is known that 30 of these businesses had subscribed to broadband while it was available in Churchill.

In the case of Parrsboro, the survey list was created through a consolidation of the 2003 business directory provided by CREDA and the current business directory residing on the Town of Parrsboro web site. Duplications were removed and the list was vetted through feedback from

CREDA as well as by efforts from the research team throughout the survey deployment process. The final vetted list for Parrsboro consisted of 158 organizations.

The initial survey list for both communities was provided to the telephone survey company, Opinion Search, on July 18, 2005. The final vetted list consisted of 218 businesses and organizations (Churchill and Parrsboro combined).

It should be noted that approximately 1/3 of the business listed did not have a contact name. This can be a challenge to a telephone survey process in that the percentage of successful survey completions is improved when a contact name is available. However, the fact that many of the business are sole proprietorships means that the person answering the phone is very likely the owner. Another mitigating factor is the level of community promotion that was provided by CREDA in Nova Scotia and the Churchill Chamber of Commerce in Manitoba. Both of these organizations have emerged in this process as local project champions for the research team.

2.2.3 Sampling Frame

The sampling target for community broadband studies is census. Given the sample size for this survey the statistical significance at the 95% confidence level is within +/- 10%. In this project, Opinion Search (www.opinionsearch.com) were arranged to administer a telephone-based survey. The list of business owners was provided to Opinion Search as a sorted list, ranked based on employment size and local knowledge of the business within the list.

Given the relatively small total sample size, Opinion Search was directed to contact all organizations on the survey list for both Churchill and Parrsboro and this was accomplished.

2.2.4 Survey Design

The survey design was based on SNG's field-tested survey instrument. Using this as the starting point, both the Parrsboro and the Churchill surveys were fine tuned to address the unique study requirements within this assignment. As a result, the research team applied one survey that includes 39 possible data points for comparison to Statistics Canada data (as per their Electronic Commerce and Technology 2004 Survey; ref. 5-4600-501.1: 2004-09-13). The survey instrument contained 25 questions related to Internet usage and benefits; 3 of these questions were open-ended, the remaining balance consists of closed ended questions.

2.2.5 Survey Deployment

In administering the survey, Opinion Search Inc. was asked to call business based on the mailing lists that were provided for both Churchill and Parrsboro. The survey was coded into their system for telephone calling, with survey implementation beginning during the week of July 18, 2005. As part of this process, the survey was tested with about five test calls to respondents prior to full survey deployment. Any issues with the questions (syntax and interpretation) were addressed following the pre-test.

The calling protocols dictated that Opinion Search would make a minimum of 5 attempts to contact survey respondents between July 20 and July 29. The duration of survey deployment would depend upon the rate of success in making contact with respondents and would be extended beyond July 29, depending on response rates.

Interim survey results were provided by Opinion Search on July 29 for purposes of developing the Draft Interim Report for Aug 8. This data consisted of results from 48 completed surveys. In order to maximize the results from the survey activity, the survey was allowed to continue until August 22. The final statistics on the survey deployment activity are summarized below:

Table 1 – Summary of Number of Organizations Surveyed

Measure	Churchill	Parrsboro	Overall
Organizations Attempted[7]	60	158	218
Total Eligible[8]	52	130	182
Total Asked[9]	37	100	137
Completed Surveys	**28**	**45**	**73**
% Completion (Eligible – i.e. all contacts, includes contacts not reached)	54%	35%	40%
% Completion (Asked – i.e. contacts reached)	**76%**	**45%**	**53%**
% Employment covered	80%	76%	78%

While not all organizations completed the survey, those organizations that did represent the majority of employment in each community, approximately 80% for Churchill, 76% for Parrsboro, and 78% overall. Results from these completed surveys are included in this report in sections 3.2 and 4.2, and in Appendices D and E.

2.3 Broadband User Interviews

A form of primary research, high-level interviews are the most effective method to collect a significant amount of current information based on the knowledge of the interview participants. The focus of the interviews is to understand what organizations are doing to benefit from broadband and to quantify the resulting impacts in terms or revenues, costs, and jobs. The interview also gives the interviewer the opportunity to qualify the reported impact and determine whether the impact is attributable to broadband. The list of organizations to be interviewed has been developed based upon the survey responses and input from the local advisory groups in each community.

Within the community of Churchill, this project has involved the support and cooperation of three local organizations: the Town of Churchill, the Churchill Community Network, and the Churchill Northern Studies Centre. Each of these organizations is concerned about the Internet connectivity for their community. This local advisory group has been able to provide critical commentary throughout the project and provide access to local resources. Communications occur with members of the local advisory group in Churchill on a regular basis.

With respect to the community of Parrsboro, we had the advantage of the full cooperation and assistance of Mr. Ron MacNutt from CREDA. CREDA participated in a number of interviews, both in the preparation of our proposal for this study and through subsequent discussion in the execution of this study. CREDA has remained in phone and e-mail contact with our team members throughout.

[7] Organizations Attempted are all organizations sourced from community business directories.
[8] Total Eligible are organizations that have a valid phone number.
[9] Total Asked are organizations that were successfully contacted and requested to participate in the survey.

2.3.1 Local Advisory Group and Workshops[10]

In both communities informal local advisory groups were established to provide both local knowledge and, in exchange, support the local community's understanding of the benefits of broadband as they are revealed throughout the study.

The local advisory committee was, in effect, part of a strategy to ensure local commitment and local support of the process. The benefits of working with the local advisory groups in Churchill and Parrsboro shaped our methodology by opening the business community in a manner that might not have been possible without this approach.

Our advantage in Parrsboro related to the relationships established by members of the research team as a result of previous projects, and a general familiarity with the key people in economic development in the area. As a result of this, CREDA was approached during the proposal process and became a strong supporter of our study. This has facilitated the development of an advisory committee that included local business leaders and those with a strong knowledge of the Parrsboro area and the relationship between business development opportunities and access to broadband.

On August 3rd, members of the research team engaged in a workshop session with 4 business leaders in Parrsboro to confirm survey findings and develop real world case study experiences of the benefits of broadband. Eight members of the business community were invited to the workshop session. However, four individuals were unable to attend the workshop session at the last minute due to demands of their businesses. The results of this session are included in section 4 of this report.

Due to geography and cost of travel, a workshop session could not be held with members of the Churchill business community. Select members of the Churchill business community, identified with the assistance of the local advisory committee, were contacted during the high-level interview phase via telephone. Similar to Parrsboro, these interviews focused on confirming the survey findings and exploring the benefits of broadband Internet. In lieu of a workshop session, supplementary information regarding the broadband situation in Churchill is presented from previous research conducted by the Rural Development Institute, Brandon University. This information parallels the information gleaned from the Parrsboro workshop session. This research was conducted with members of the Churchill business community in chronicling the story of broadband Internet to the community in the Spring of 2005.

Note that a critical determinant in the local area's willingness to support the process was the expectation that the results of the process would be shared with the local stakeholders.

2.3.2 Interview Guide

In order to collect consistent and quantifiable results, an Interview Guide for high-level interviews was developed to provide guidance to the research team. The Interview Guide contains 14 open-ended questions, with several sub-questions, designed to explore and quantify the specific impacts that broadband has had on individual organizations being interviewed. The broadband impact topics covered by these questions include:

- Changes to the organization's use of the Internet;
- New services and applications being used;
- Job creation and retention;

[10] The proposal terminology referred to these local groups as "Local Advisory Committees". In practices, the session was more reflective of a working session/workshop and local based knowledge, which, ultimately, was the intent of these local groups.

- Effects on the organization's business processes (e.g., sales and cost impacts);
- Commercial and/or industrial expansion;
- Effects on the local labour force;
- Training and support requirements;
- Future expectations; and
- Perceived and actual community benefits.

Where appropriate and when possible, quantified data was collected for the purpose of attributing the impacts to broadband use. Quantifiable data collected included:

- Numbers of jobs (added, retained, or lost),
- New business investments,
- Increased sales revenues,
- Decreased costs,
- Increased productivity, and
- Time period to realise impacts.

In addition to obtaining quantifiable data, a key focus of the interviews was to get the stories behind the impacts and determine what the organizations are doing and how. As this can be quite varied and specific, the interview technique provides much richer information than can be sourced from the initial survey step.

2.3.3 Interview Selection

The target local stakeholders to be interviewed are those that are known to have a significant impact on the local economy and those who had identified a positive impact from broadband through the telephone survey step. Organizations surveyed were asked for permission to contact them for follow-up interviews. The research team has attempted to interview all organizations who provided permission, as well as those who may not have completed the survey but who are major forces in the local economy.

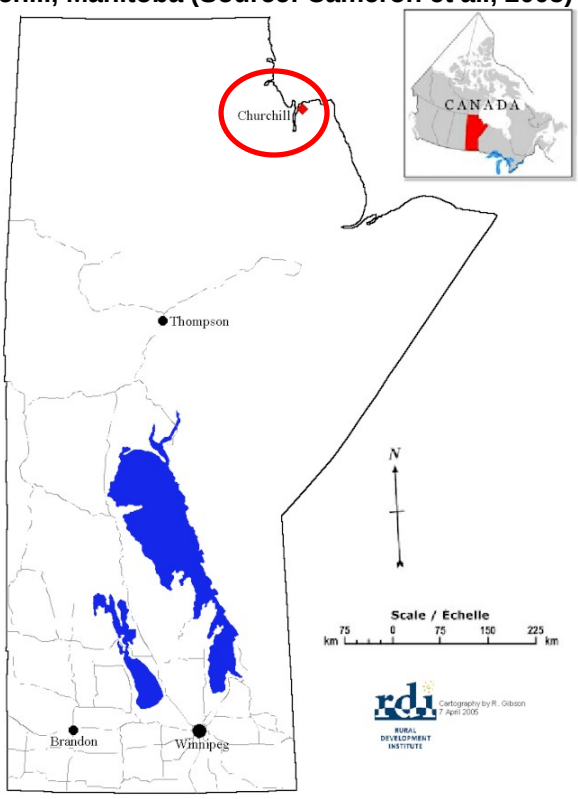
3.0 Study Findings for Churchill, Manitoba

This section describes the data collected for Churchill through the survey and interview process and summarizes the significant results.

3.1 Background and History

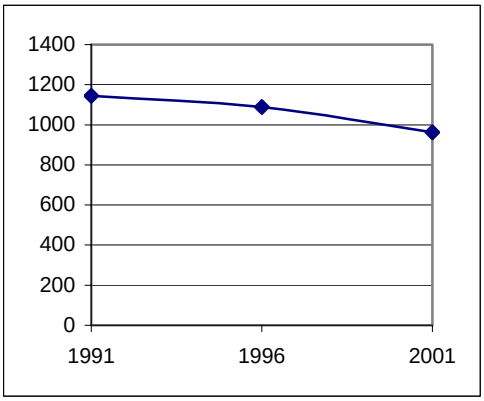
The town of Churchill, population 963 (Statistics Canada, 2001) is situated on the southwest shore of the Hudson's Bay approximately 1,000 kilometres north of Winnipeg, Manitoba by air and 1,700 kilometres by rail (see Figure 1). Churchill is one of the northern most communities in Manitoba, and as such, the community is a hub for medical services, transportation services and tourism in northern Manitoba and Nunavut. The local economy is centered on transportation, tourism and service industries.

Figure 1 - Map of Churchill, Manitoba (Source: Cameron et al., 2005)



The population of Churchill has declined by 11.6% between 1996 and 2001 (Statistics Canada, 2005a). Since 1991, the community has witnessed a continual decline in their population (Figure 2). Churchill is a complete census sub-division located within Census Division 23 as defined by Statistics Canada. Churchill is the only community located in this census sub-division that lies adjacent to the Hudson Bay.

Figure 2 - Population Change in Churchill (Source: Statistics Canada, 2001)



Originally developed in the 1600s as a fur-trading center for the Hudson's Bay Company, the Town of Churchill has developed a busy rail line and airport (Town of Churchill, 2005). The community also has the only inland saltwater port in Canada. Air or rail brings in goods from the south, and then shipped by barge or sea going vessels to numerous points through the north. The Port of Churchill is a fully functioning seaport, capable of shipping most bulk commodities and many other import and export products. The Churchill Grain Terminal can clean and store 140,000 tonnes of grain for shipment during the late summer season. One of the largest of all industries in the community is tourism. Churchill is a tourist destination for watchers of a variety of species, including birds, beluga whales and polar bears, as well as observers of the northern lights. Many of the small businesses in the Churchill area cater directly to the influx of tourists, by providing accommodation, and meals, tours and information (Manitoba Community Profiles, 2005). The community has a diverse business directory, however, a major component consists of the tourism and service sectors.

For Churchill, broadband was introduced through the efforts of concerned local residents who created a non-profit organization. This non-profit organization (CCNet) was able to access funding from a variety of sources to establish broadband services. Below is a brief description of how each community established broadband services.

3.1.1 History of Connectivity, Churchill

Until 1996, the community of Churchill did not have an Internet service provider. A local group of residents concerned with the lack of access to the Internet formed the Churchill Community Network (CCNet) to address this issue. CCNet worked to provide the community with access to the Internet at a low cost. In April 1996, Churchill received dial-up Internet access through an Internet service provider in southern Ontario. A year later, CCNet started operating their own dial-up service to the community (Manitoba Energy, Science, and Technology, 2002). The impacts of initiating dial-up Internet services were identified as strengthening local enterprises, strengthening the tourism sector, facilitating Arctic research and education, and being able to overcome the remote location/geography (Cameron et al., 2005).

Through the encouragement of its members/clients, CCNet began exploring the options for high-speed Internet in 2001. In the summer of 2002, Churchill received broadband Internet through a new wireless technology developed by Global Wireless Satellite Networks. The technology was made available to CCNet below market cost, as Churchill would be a test site for the technology (Annis et al., 2005). CCNet was able to finance the broadband development through loans from North Central Community Futures Development Corporation and the Hydro Mitigation Trust Fund. CCNet developed their business plans and starting implementing their program just prior to the Broadband for Rural and Northern Development Pilot Program of Industry Canada. As such, Churchill found it was ineligible for funding through this program (Cameron et al., 2005). While

the switch to broadband led to increased speed and uploading/downloading capacity, it proved more difficult than dial-up service to maintain. The CCNet volunteer board struggled to keep op top of maintenance and repairs. Difficulties for CCNet were compounded in 2003 when Manitoba Telecom Services, Canada's third largest communications provider, began offering a dial-up Internet service. This dial-up service drew away some broadband subscribers due to a less expensive monthly package, adding to the financial pressure. Other events, such as the crash of converters on the satellite communication equipment, forced CCNet to change their connection from the satellite connection over to MTS' land based fiber optic link. The conversion to the land based fiber option link resulted in a faster broadband connection.

In May 2005, CCNet dissolved due to low member support and unreliability of their broadband network. Since 1997 when CCNet first offered dial-up Internet services, the non-profit organization never hired any staff members. Instead, the volunteer board took on responsibility for installations, repairs, and maintenance. Prior to terminating broadband Internet service, members of the community indicated the value of having broadband as being: support for education, support for Arctic research, and online information about the Town and its operations (Cameron et al., 2005).

With CCNet's volunteer group dissolved, broadband service clients had no option but to switch to dial-up service provided through MTS. Businesses and local organizations are currently in discussions with various organizations and levels of government to return broadband Internet services to the community.

3.2 Uses of the Internet and Broadband

Of the 60 organizations in Churchill, 28 completed telephone surveys (46%) exploring their use of the Internet and benefits from broadband. **This section summarizes some of the highlights from the survey results**. Additional details for Churchill survey results can be found in Appendix C.

Table 2 – Churchill Survey Respondents by Industry

Retail Trade	4
Arts, Entertainment and Recreation	1
Tourism, Accommodation and Food Services	9
Finance and Insurance	1
Professional and Technical Services	1
Educational Services	2
Health Care and Social Assistance	1
Government	4
Transportation and Warehousing	1
Other	4
TOTAL	28

The organizations surveyed represent a total employment base of 472 employees with an average size of 17 employees per organization and a median of 7. There are approximately 590 [11]employed residents of Churchill.

Of the survey respondents, 14 had used broadband in the past when it was available in Churchill and 5 are continuing to use other means of high-speed access (private or wireless connectivity). Only one respondent no longer has Internet access (formerly a broadband user).

[11] Source: Statistics Canada 2001 Community Profiles

The following are highlights from the survey results for Churchill:

- Key uses of the Internet for broadband vs. dial-up users

Table 3 – Internet Usage by Churchill Organizations

Internet Use	Broadband Users	Dial-up Users	Statistics Canada[12]
Research	85%	85%	N/A
Selling goods and services	62%	46%	TBD
Purchasing goods and services	69%	46%	46.5%
Web Site	86%	54%	36.8%
Advertising	69%	54%	N/A
Customer orders	54%	46%	N/A
Electronic Document Transfer	62%	46%	N/A

- Key benefits of the Internet for broadband vs. dial-up users

Table 4 – Internet Benefits by Churchill Organizations

Internet Benefit	Broadband Users	Dial-up Users	Statistics Canada
Makes day-to-day operations easier	86%	77%	N/A
Improves customer service	79%	77%	N/A
Reach new customers	64%	54%	TBD
Increase sales	50%	54%	N/A
Lower costs	50%	54%	TBD

3.2.1 Uses of the Internet

All Churchill organizations surveyed currently use (96%) or plan to use (4%) the Internet in the next 12 months. It should be noted that High-speed Internet recently became unavailable and therefore respondents were asked if they had used High-speed when it was available. Those that had used High-speed are considered to be broadband users in the context of their responses.

For Churchill, a large number of organizations provide direct access to computers, e-mail, and Internet to more than 75% of their employees. 64% provide direct access to computers, 70% provide direct access to the Internet, and 67% provide direct access to e-mail.

Sixty-seven percent of respondents rated e-mail as essential or very important method of communicating with customers, second only to telephone contact (71%). However, e-mail is considered of less importance for communication with suppliers. 41% consider e-mail essential or very important for supplier communications vs. 57% for telephone and 39% for fax.

For broadband users, the number one business use of the Internet is for research, with reported use by 85% of organizations. A large number of organizations use the Internet to purchase (69%) or sell (62%) goods and services over the Internet. 69% advertise over the Internet and 62% use the Internet for electronic document transfer. With the exception of research, these statistics are significantly higher for broadband users than for dial-up users of whom 46% reported buying or selling goods and services, 54% advertising, and 46% electronic document transfer.

[12] Statistics Canada E-Commerce and Technology Survey 2004

3.2.2 Organizations that have Web Sites

In Churchill, 71% of organizations reported having their own web site. Of those, 45% manage their own web site. Of those without their own web site, reasons cited were; cost of developing and maintaining a site, security concerns, and not needed for their products and services. Only one organization said that the Internet was too slow for a web site.

The predominant uses of the organizations' web sites are for providing information about the organization (95%), its products and services (90%), advertising and promotions (85%), and for customer enquiries (80%). 45% use their web site for receiving customer orders but only 15% actually take on-line payments through their web site.

3.2.3 Benefits from the Internet

Respondents were asked to identify all of the ways their organization has benefited from the Internet within the past 12 months amongst a selection of 12 benefits categories.

Of broadband users, 79% reported receiving at least one of the benefits categories, with 5 benefits reported on average. The clear number one benefit category for Churchill organizations is making day-to-day operations easier (86%), followed closely by improving service to customers (79%). However, there is also a very clear perception that the Internet is a benefit for reaching new customers (64%), increasing sales (50%), lowering costs (50%), and reducing time to market (43%).

3.3 Broadband Impacts

The economic impact of broadband for the community of Churchill has been organized into 3 categories: revenue impacts, cost impacts, and employment impacts. Based on information collected through the telephone survey and the local advisory group, 14 businesses were identified in Churchill to follow-up with high-level interviews. Due to time availability, two businesses declined to participate in the high-level interviews. Of the 12 businesses that participated in the high-level interviews, 3 were from the travel/tourism sector, 4 retail sales, 4 other organizations, and 1 service.

3.3.1 Revenue Impacts

Eight respondents to the survey and interview reported **total gross sales over the Internet of $869,000** in the past 12 months. Seven of these businesses derived Internet revenue from using broadband. Five of these businesses are former broadband users, and 2 of these are continuing to use high-speed access generating combined **gross revenues of $400,000**. These companies felt that continuing to use broadband access was important enough to source another higher cost solution to maintain broadband rather than reverting to dial-up access.

Businesses interviewed indicated that revenue was generated through the use of broadband service. Businesses noted that revenue was generated through online reservations, online retail sales, and online tour bookings. Businesses also indicated that their revenues have been affected by broadband through their ability to conduct banking online and increased productivity in the office (e-mail, downloading, program updates). Due to the current lack of affordable broadband in the community, there are services that respondents (i.e. businesses and organizations) reported they could not provide to their clients. Select education courses/training programs require broadband to be delivered (streaming audio and video in particular) and e-commerce development at a retail service will wait until broadband is returned to the community. Three respondents described how broadband allowed advanced websites to be developed, which includes the option for online purchasing and reservations. Businesses stressed the importance

this function of broadband for accessing potential clients, some instances indicating up to 75% of sales or reservations/bookings were arrived through their websites.

> *Broadband allows us to remain competitive in the market place, especially with other tour-oriented companies. Approximately 70% of our sales are conducted via the Internet. Five years ago, less than 5% of sales were conducted through the Internet --- Tour Operator*

When the total revenue reported through the interviews is added to that reported by other businesses surveyed, the **total revenue generated via broadband by Churchill businesses was $769,000** in the past 12 months. A breakdown of results is provided below. The names of respondents are not provided to protect confidentiality.

Table 5 – Churchill Internet Revenue Summary

Business Type	BB User	Survey	Interview
Retail A	Yes*	$150,000	No Interview
Retail B	No	$100,000	No Interview
Retail C	Yes*	$20,000	No Interview
Education A	Yes	$300,000	Not reported
Tourism A	Yes	$100,000	$100,000
Tourism B	Yes*	$125,000	No Interview
Retail D	Yes*	Not reported	$10,000
Accommodations A	Yes*	Not reported	$64,000
	Total		
Total Revenue from BB users	**$769,000**	**$695,000**	**$174,000**
Total Revenue from non-BB users	$100,000	$100,000	$0
Total Revenue	$869,000	$795,000	$174,000

* Former users of CCNet broadband service

> *We rely heavily on the online catalogue found on our website. For the last couple of years, we no longer printed the catalogue and instead rely solely on our website. Our wholesalers are now using our online catalogue to determine their purchases. --- Retail Business*

> *Prior to broadband, approximately 25% of reservations were conducted by the Internet. Since broadband arrived our online reservations have increased to 75%. --- Hotel Operator*

3.3.2 Cost Impacts

The cost impacts of broadband in Churchill, as reported by respondents, have been categorized as cost savings and cost of replacing broadband. As a direct result of broadband, two businesses indicated a **savings of $32,000**. Broadband, and businesses' ability to make full use of the Internet, were able to reduce the amount of printed promotional material and savings in the associated postage.

The Internet has reduced the need for postage costs. The business no longer conducts mass-mails outs which has reduced the need to large postage expenses. --- Hotel Operator

With the loss of broadband from the community, one business experienced a decrease in revenue. As dial-up Internet service was inadequate for delivery education programming, that business anticipates a **loss of $4,200 in sales**.

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 to replace broadband was $32,400**. One of these organizations was a business that re-established high-speed. The owner noted that paying for this new service is unsustainable on the long-term; however, it was required to ensure the needs of the clients. The owner also indicated the business will have to find a means to cover this additional expenditure. A similar comment was made by a respondent from the public sector:

When the DSL [13]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 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. --- Government organization

In addition to the quantified cost impacts, organizations were quick to point out other cost impacts of broadband.

- A local education provider indicated that without a broadband connection, post-secondary students may have to leave the community to obtain further education. If a broadband connection were available, more courses would be available to students, thereby eliminating the need to leave the community. This reduces the costs for students in obtaining post-secondary education.
- Essential in downloading e-mails, documents, and required files for all businesses.
- Increased office productivity by decreasing time spent waiting for e-mails and downloads. Broadband has also decreased the amount of paper that offices are using.

3.3.3 Employment Impacts

As a result of broadband, local organizations were able to identify employment impacts. In Churchill, this includes jobs supported by broadband, jobs lost to outsourcing due to the lack of broadband, and jobs that would be potentially created with the return of broadband.

Three businesses indicated that through broadband they **retained or supported 2.7 FTE**[14] **jobs**. Jobs retained/supported included positions in travel/tourism, computer support, and administrative staff. With the absence of broadband, businesses indicated that **4.0 FTE jobs were outsourced** to a different community. All of these jobs were outsourced to Winnipeg and were

[13] Digital Subscriber Loop
[14] Full-Time Equivalent employee (FTE)

from the travel/tourism industry. These jobs required broadband to handle the computer software programs and the ability to quickly transfer files from these programs. Two businesses indicated that potentially **2 new jobs would be created upon the return of broadband to the community**. A permanent IT personnel/system administrator and a contract website developer were indicated by businesses as part of their future goals, when broadband is returned to the community.

In addition to jobs added, lost, or desired, respondents also indicated that the quality of labour has been increasing. One of the respondents informally linked this increase in quality to the access to broadband:

> *Many of the people we have hired lately have very good computer and Internet skills. Three or four years ago this wasn't the case. I am sure that having Internet in the community has informally helped to build better skills in the workforce. --- Government organization*

3.3.4 Economic Context

To put these impacts in context, the following economic overview is provided for Churchill.

The Town of Churchill has a small business sector that is dominated by employment in shipping and transportation (21% of the labour force) as a historic transportation hub for the north, linked by rail, air, and the only inland saltwater port in Canada. The Institute of Arctic Ecophysiology provides a scientific base for much of the research of the Artic. Other important sectors include health care (19.53% of the labour force) and the local government. Tourism is also becoming an important sector for Churchill (7% of the labour force).

With slightly less that 1000 people living in the community, Churchill's labour force enjoys a fairly high average income ($38,045) and, compared to other rural northern communities, a relatively low unemployment rate (13.4%). Statistics Canada 2001 Community Profiles reports the labour force for Churchill was 690 individuals, with 590 individuals who earned an average $28,951 per year. Based on this, the total earned income in Churchill is slightly more than $17 million through a combination of full time earnings of ($11 million) and part-time ($6 million). Under some assumptions concerning hours worked per week and that the labour force would remain unchanged, the broadband survey results were used, together with Statistics Canada 2001 Census data to generate the following results.

- Jobs outsourced due to lack of broadband – 4 FTE, which provides $190,225 in earned income that was lost as a result of broadband being lost;
- Jobs supported by broadband (retained) – 2.7 FTE, which provides $102,721 in earned income retained within the community;

The implication of losing 6.7 jobs in a community with 590 people employed (in the 2001census) because of the loss of broadband is equivalent to Ottawa losing 5,638 jobs.

These numbers at a high-level characterize the relationship between broadband and employment. Previously SNG has used regional Input-Output modeling to estimate the effects of broadband on

[15] Full-Time Equivalent employee

[16] Note that the Community Profiles reports for the following statistics for Churchill:
Participation rate - 84.40%
Employment rate - 73.00%
Unemployment rate - 13.40%
Based on the total population 15 years and over (715), the labour force is 603.46, employment is 521.95, and unemployment is 80.86. The calculations above assume the labour force is held constant and the FTEs added

jobs, GDP and tax revenues, but neither the time nor budget for conducting such analysis was available for this project.

3.3.5 Summary of Churchill Impacts

There were 28 respondents to the survey of Churchill businesses, 14 of which were broadband users.

- Of the 14 broadband users surveyed, 7 reported increased income from using the Internet (i.e., 50%)
- 7 broadband users reported through surveys and interviews annual Internet revenues totalling $769,000 over the last 12 months
- Of the 14 broadband users surveyed, 7 reported reduced costs from using the Internet (i.e., 50%)
- 8 broadband users were interviewed, 2 of which provided details on cost savings which totalled $32,000 over the last 12 months
- Cost savings categories reported were reduced printing and postage cost related to marketing

In the case of Churchill, the majority of businesses reporting use of broadband are former users of CCNet and no longer have access to broadband service. Due to the importance of broadband on their business operations, two businesses continue to use broadband sourced from another service provider at much higher cost. $400,000 of the reported revenue comes from these two businesses in Churchill that continue to use broadband at a cost of $900/month.

The revenues and costs are reported for the preceding 12 months. With the exception of the two businesses continuing to use broadband, the remaining businesses can be assumed to have had broadband for no more than 9 of the past 12 months as broadband service was discontinued in May 2005. Therefore, revenue and cost savings from broadband Internet as reported above could be prorated at 75% to reflect 9 months of service.

Additional Broadband Impacts

- $4,200 decrease in revenue as a result of the lack of broadband
- $32,400 increased costs to re-establish high-speed connection

Employment impacts of Broadband

- 2.7 FTE jobs retained or supported by broadband
- 4.0 FTE jobs outsourced due to the loss of broadband
- 20-30 FTE potentially added with resumption of affordable local Broadband connectivity

increase the level of employment by reducing the number of unemployed. In reality one would expect some increase in labour force participation as employment opportunities increase.

4.0 Study Findings for Parrsboro, Nova Scotia

This section describes the data collected for Parrsboro through the survey and interview process and summarizes the significant results.

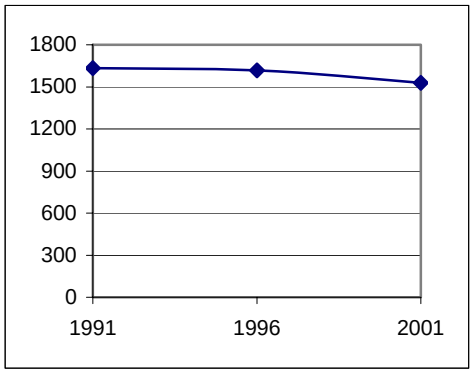
4.1 Background and History

The town of Parrsboro, population 1,529 (Statistics Canada, 2005b) is situated in the northwest area of Nova Scotia (Figure 3). The community is situated on Minas Basin in the Bay of Fundy. The larger surrounding communities around Parrsboro include Amherst (pop. 9,470), Truro (pop. 11,457), and New Glasgow (pop. 9,432). Parrsboro is the largest community on the Minas Basin and a major tourist centre.

Figure 3 - Map of Parrsboro, Nova Scotia (Source: NS Online, 2005)

The population of Parrsboro has declined by 5.4% between 1996 and 2001 (Statistics Canada, 2005b). Since 1991, the community has witnessed a slow decline in their population (Figure 4). Parrsboro is a complete census sub-division located within the Cumberland County Census Division as defined by Statistics Canada. Parrsboro is the only community located in this census sub-division.

Figure 4 - Population Change in Parrsboro (Source: Statistics Canada, 2001)



The original development of Parrsboro could be attributed to the community's location on a river valley that cuts through the Cobequid Hills to the sea at the Minas Basin and the opportunities in lumber and coal (Centennial Book Committee, 1988). Employment in the area has largely focused on primary industries, such as fishing, lumber, and mining (Keefe and Side, 2003). According the to the 2001 Census, the community of Parrsboro had two large employment-based industries/sectors:

1. Sales and Services – This sector consisted mostly of government services, tourism employment, health services employment, and education service employment.
2. Trades, Transportation and Equipment Operators – This sector was dominated by Kerr Heating Products.

In Parrsboro, the development of broadband came through the assistance from Industry Canada's BRAND program and local Town Council financial contributions ($20,000). Below is a brief description of how the community established broadband services.

4.1.1 History of Connnectivity, Parrsboro

Parrsboro was connected with broadband Internet services in November 2004, having had dial-up service for some years before that. Connecting to broadband services in the community was made possible through Industry Canada's BRAND program. The Cumberland Regional Economic Development Association (CREDA) acted as a local champion in the application that saw eight communities in the region received assistance to development broadband services (Advocate Harbour, Joggins, Malagash, Parrsboro, Pugwash, River Hebert, Wallace, and Wentworth). The Parrsboro application received strong local support, as demonstrated by the Town of Parrsboro contributing $20,000 towards the project.

Broadband services in Parrsboro are provided through Aliant Inc. Services are available within a radius of approximately 4 kilometres from the Aliant Inc. transmission tower. The radius eligible for broadband services has disappointed some Parrsboro residents according to local media. Since service was developed with Aliant Inc., a second communications company now provides broadband Internet services to Parrsboro. Eastlink Cable commenced offering broadband services in Parrsboro shortly after Aliant. As not all communities in the Cumberland Region have access to broadband services, residents of non-serviced communities recently have been receiving attention in regional media.

4.2 Uses of the Internet and Broadband

Of the 73 surveys completed for this study, 45 were from Parrsboro. Of these, 19 respondents are current broadband users. **This section summarizes some of the highlights from the survey results**. Additional details for Parrsboro survey results can be found in Appendix D.

The following table shows the breakdown of respondents by industry.

Table 6 - Parrsboro Survey Respondents by Industry

Agriculture / Forestry / Fishing	5
Retail Trade	7
Manufacturing / Processing	3
Arts, Entertainment and Recreation	1
Tourism, Accommodation and Food Services	12
Professional and Technical Services	4
Health Care and Social Assistance	3
Utilities	1
Other	9
TOTAL	45

It should be noted that the organizations surveyed represent a total employment base of 544 employees with an average size of 12 employees per organization and a median of 5. There are approximately 715 [17]employed residents of Parrsboro.

Of the survey respondents, 19 currently use broadband service.

The following are highlights from the survey results for Parrsboro:

- Key uses of the Internet for broadband vs. dial-up users

Table 7 – Internet Usage by Parrsboro Organizations

Internet Use	Broadband Users	Dial-up Users	Statistics Canada[18]
Research	89%	93%	N/A
Selling goods and services	32%	27%	TBD
Purchasing goods and services	74%	53%	42.5%
Web Site	63%	53%	36.8%
Advertising	47%	53%	N/A
Customer orders	47%	13%	N/A
Electronic Document Transfer	74%	33%	N/A

- Key benefits of the Internet for broadband vs. dial-up users

Table 8 – Internet Benefits by Parrsboro Organizations

Internet Benefit	Broadband Users	Dial-up Users	Statistics Canada
Makes day-to-day operations easier	89%	73%	N/A
Improves customer service	68%	53%	N/A
Reach new customers	47%	47%	TBD
Increase sales	47%	33%	N/A
Lower costs	37%	27%	TBD

4.2.1 Uses of the Internet

Of Parrsboro organizations surveyed, 76% currently use the Internet with an additional 2% who plan to use it within the next 12 months. Of those using the Internet, 57% of organizations are currently using high-speed Internet, and that percentage is expected to rise to 83% in the next 12 months.

For Parrsboro, less than half of organizations surveyed provide direct access to computers, e-mail, and Internet to more than 75% of their employees. 50% provide direct access to computers, 41% provide direct access to the Internet, and 39% provide direct access to e-mail.

Only 39% of respondents rated e-mail as essential or very important method of communicating with customers, placing e-mail as third in importance behind telephone contact (73%) and in-person contact (69%) methods. For Parrsboro respondents, the telephone is by far the most important method for communication with suppliers. 62% consider telephone contact essential or very important for supplier communications vs. 26% for fax and only 18% for e-mail.

[17] Source: Statistics Canada 2001 Community Profiles
[18] Statistics Canada E-Commerce and Technology Survey 2004

For broadband users, the number one business use of the Internet is for research, with reported use by 89% of organizations. On-line purchasing and electronic document transfer are the second most used application by 74% of organizations. Of significance, only 32% of businesses sell goods or services over the Internet, and 63 % have no plans to do so within the next 12 months. Similarly, only 47% of businesses use the Internet to receive customer orders, and 47% have no plans to use on-line customer orders within the next 12 months. However, with the exception of research, these statistics are significantly higher for broadband users than for dial-up users, of whom 27% reported selling goods and services, 53% purchasing goods and services, 13% taking customer orders, and 33% electronic document transfer. While use by broadband users is significantly higher in these categories, the data points to an under-utilization of the Internet's potential for these organizations.

4.2.2 Organizations that have Web Sites

In Parrsboro, 60% of organizations reported having their own web site. Of those, 67% manage their own web site. Of those without their own web site, organizations cited security concerns or an uncertainty of the benefits of a web site for their organization.

The predominant uses of the organizations' web sites are for providing information about the organization, its products and services, customer enquiries, and for advertising and promotions. Only 38% use their web site for receiving customer orders and 24% actually take on-line payments through their web site.

4.2.3 Benefits from the Internet

Respondents were asked to identify all of the ways their organization has benefited from the Internet within the past 12 months amongst a selection of 12 benefits categories.

All broadband users reported benefiting from at least one of the benefits categories, with 4.5 benefits reported on average. The clear number one benefit category is making day-to-day operations easier as reported by 89% of Parrsboro organizations. This is followed by improved service to customers (68%). A slight majority reported that the Internet has helped them improve coordination with suppliers (53%). However, less than half reported that the Internet has helped them reach new customers or increase sales (47%). Only 37% report that using the Internet has reduced costs, while 58% report that it has not. The fact that a small number of organizations report that the Internet has improved skills or enabled employees to tele-work is most likely a result of these benefits being realizable by only certain types and size of business.

4.3 Broadband Impacts

The economic impact of broadband for the community of Parrsboro has been organized into 3 categories: revenue impacts, cost impacts, and employment impacts. Based on information collected through the telephone survey and the local steering group, 15 businesses were identified in Parrsboro to follow-up with for high-level interviews. The businesses that participated in the high-level interviews were from the following sectors of the economy: 5 retail businesses, 4 service businesses, 3 travel/tourism businesses, 2 manufacturing, and 1 agriculture/forestry.

4.3.1 Revenue Impacts

Of those respondents who reported selling goods or services over the Internet, regardless of type of connection, the aggregate gross sales from the Internet over the past 12 months reported through the survey totaled only $26,000.

Through the interviews, businesses indicated that **$43,100 of revenue** was generated through Internet sales and reservations. Many businesses indicated that revenue impacts of broadband

were difficult to quantify because their use of broadband service was relatively new. Businesses indicated that their revenues have been affected by broadband through their ability to conduct banking online, increased productivity in the office (e-mail, downloading, program updates), and access new markets. Businesses also indicated they anticipate broadband will have a greater impact on the revenue of their business in the short-term future.

> *At the moment, broadband hasn't changed the way we sell our product. I would anticipate that we will change the way we sell our product in the future. Within 2 or 3 years, I would anticipate that all our orders would be conducted through e-commerce. --- Manufacturer*

> *Approximately 5% of sales are initiated through our website. --- Retail Services*

When the total revenue reported through the interviews is added to that reported by other businesses surveyed, the **total revenue generated by Parrsboro businesses that use the internet was $69,100 ($26,000 plus $43,100), of which broadband users accounted for $58,000** in the past 12 months. Given that broadband service has been available in Parrsboro for 9 months, this amount should be prorated to approximately $43,500 from broadband. A breakdown of results is provided below. The names of businesses are not provided to protect confidentiality.

Table 9 - Parrsboro Internet Revenue Summary

Business Type	BB User	Survey	Interview
Accommodations B	Yes	$20,000	No Interview
Accommodations C	No	$5,000	No Interview
Tourism C	Yes	$1,000	No Interview
Accommodations D	No	Not reported	$6,100
Entertainment A	Yes	No Survey	$37,000
	Total		
Total Revenue from BB users	**$58,000**	**$21,000**	**$37,000**
Total Revenue from non-BB users	$11,100	$5,000	$6,100
Total Revenue	$69,100	$26,000	$43,100

4.3.2 Cost Impacts

The businesses of Parrsboro identified cost impacts of broadband in the categories of cost savings from reduced travel, cost savings from reduced postage, and cost savings from new markets. Broadband service allowed businesses in Parrsboro to reduce the amount of travel that is required of their employees through online training sessions and online markets. Two businesses indicated a **savings of $22,000 in reducing travel** as a result of broadband. Although broadband is quite new in the community, these two businesses have been able to capitalize on this opportunity. Other businesses indicated that they would like to have staff participate in online training; however, they have yet to do so.

> *Through broadband, we are able to participate in online auctions. We are able to view vehicles before they are auctioned on the website. This helps us in customizing sales for our clients. Through the online auction, we can see what vehicles will be available and if the customer is interested in it. This helps to keep vehicles moving off the lot. --- Car Dealership*

As a result of having broadband, a business was able to identify a **savings of $100 from reduced postage**. Access to broadband has allowed a service business to reduce their reliance on the postal system and increase their reliance on e-mail. Broadband enables the organization to be able to download pictures and large documents that was not possible with dial-up Internet service.

Many businesses in Parrsboro indicated that they utilize broadband to conduct research on the Internet. This research may be regarding upcoming online training sessions, price comparisons, or searching for new markets. In one case, production **costs were reduced by $10,000 through online purchasing of materials and supplies**. A second business indicated that broadband allows them to access technical support from Halifax without having the technician travel to Parrsboro. This has translated into a **savings of $5,000 in reduced technical support fees**.

Total savings identified were $37,100

> *We have been able to access new suppliers through broadband. I am able to review online catalogues and make online purchases. I was not able to do this through dial-up as it took way to long to upload the catalogues. --- Manufacturer*

Many other businesses were able to indicate that broadband has had a cost impact on business operations; unfortunately, most could not quantify these impacts/cost savings.

> *Without any hesitation, broadband has allowed us to continue to exist. If we didn't have broadband, we would not be able to compete with other manufacturers. --- Manufacturer*

> *Sure, broadband make us more competitive. We are able complete our processes better, which in the end will help us save money. This saved money can then be re-directed into equipment upgrades, etc. --- Travel / Tourism Operator*

4.3.3 Employment Impacts

Employment impacts were identified by 4 businesses. Respondents reported that **0.5 FTE jobs have been retained** in Parrsboro as a result of broadband service. Additionally, the Town's largest employer reported that they are highly dependent on broadband and would have had to move had it not been made available – this represents **140 FTE jobs**. Broadband also enabled one business to hire contract work (graphic designer) from outside the community. This contract work represents an economic value of approximately **$5,000**.

Broadband has also allowed businesses to better connect with their staff in other communities, as businesses indicated below.

> *Broadband has also allowed us to connect our server to our satellite office in a different community. This has enabled our employees outside of Parrsboro to have direct access to the documents on the server at the head office. Prior to broadband, documents had to be physically transported to Parrsboro as the documents were too large and complex to be sent via e-mail on dial-up. We are now able to have instant access. --- Manufacturer*

4.3.4 Economic Context

To put these impacts in context, the following economic overview is provided for Parrsboro. Parrsboro is a community of approximately 1,500 people and an employed labour force of approximately 525 people (See footnote 18) and average earnings for those who worked full year, full time is $26,104 based on 2001 Census. Statistics Canada 2001 Community Profiles reports the 715 individuals with earnings at an average $14,519 per year. Based on this, the total earned income in Parrsboro is slightly more than $10 million through a combination of full time earnings of ($7 million) and part-time ($3.3 million). As with Churchill, tourism, and more generally, sole proprietorships for a lot of employment with a great dichotomy between a few relatively very large employers and many small one-person operations. Employment in Parrsboro is

- Agriculture and other resource-based industries (50) 8%;
- Manufacturing and construction industries (130) 20%;
- Wholesale and retail trade (140) 22%;
- Finance and real estate (20) 3%;
- Health and education (85) 13%;
- Business services (60) 9%;
- Other services (150) 24%.

The largest employer (Kerr Heating Products) employs 140 people[19], followed by Harrison Building Centres (70); the local Co-op (22); and the Fundy Geological Museum (20). The remainder of the businesses in Parrsboro are characterized by one or two person operations.

During the interview results we learned that the presence of broadband was a significant determinant in Kerr Heating Products remaining in the community. This metal fabricator provides 100+ jobs to the community, which represents approximately $3.5 to $4.5 million in gross annual household income (based on an assumed average wage of $35K to $45K per annum.

Under the same assumptions that were used to assess the employment impacts of broadband on Churchill (i.e. Section 3.3.4), the broadband survey results for Parrsboro result in the following employment impacts:

- Jobs supported by broadband (retained) of 0.5 FTE, which is equivalent to $13,000 in earned income retained

This is equivalent to maintaining 350 jobs in Ottawa.

These numbers at a high-level characterize the relationship between broadband and employment. Previously SNG has used regional Input-Output modeling to estimate the effects of broadband on jobs, GDP and tax revenues, but neither the time nor budget for conducting such analysis was available for this project.

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[19] As sourced from http://www.kerrheating.com/ however, the company reported 90 full-time employees (140 total employees) through the survey conducted for this study.

[20] Note that the Community Profiles reports for the following statistics for Parrsboro:

Participation rate - 50.80%
Employment rate - 41.70%
Unemployment rate - 17.20%

Based on the total population 15 years and over (1260), the labour force is 640.80, employment is 525.42, and unemployment is 110.09. The calculations above assume the labour force is held constant and the FTEs added increase the level of employment by reducing the number of unemployed. In reality one would expect some increase in labour force participation as employment opportunities increase.

4.3.5 Parrsboro Discussion Group

In cooperation with CREDA (Cumberland Regional Development Authority), the study team arranged a session with community members from the Town of Parrsboro in a workshop environment to discuss the impacts of having access to broadband.

The workshop took place on August 3, 2005, and ran from 10:00 am to just before noon. A dozen people were invited to the session, but only 4 managed to attend, plus two representatives from CREDA, who were active participants. One of the invitees was present until the formal meeting started and two others who did not attend agreed to do extensive follow-up interviews later. Another absentee sent a letter of support.
A detailed summary of the discussion group is found in Appendix B. The following are some highlights from this session:

- The local Aliant representative indicated that as soon as broadband service was available, people connected without need of much sales effort. Of those who had been connected over the last 9 months, none have asked to be disconnected.
- A local software company was able to be competitive because, with broadband, it could download advance copies of new software and be ready to service local customers who might otherwise go to bigger towns.
- The software company owner also spoke about his role as a programmer for the Emergency Measures Organization based in Halifax and the benefit of having broadband has meant that he can work in Parrsboro and service this provincial client.
- There are a number of B&B's in the area and many of these are members of the Canada Select Rating program, which, we understand, now requires all rooms to have broadband access in order to achieve a 4-star rating. Those accommodations providers that are not able or unwilling to offer such connections are now being by-passed in favour of those places that do. People see connectivity as a necessity, even while on holiday.
- Broadband has also enhanced the area's capacity to serve as a convention/meeting destination by allowing those from out of town the convenience of connecting to their offices. This was not possible last year and this represents an expansion to the tourism market that was not otherwise available. There are a number of regional companies that try to schedule their summer meetings in such quiet tourist destinations.
- Kerr Heating Products is the town's largest employer with between 100 and 200 employees (depending on the season and work volumes). This company has a few key employees that live in Truro (a ~50 minute drive) and work in the plant. The fact that these key people could not communicate with high-speed from their location in Truro meant that they were sometimes tasked with physically transporting large files (CAD drawings) to and from home. The company dubbed this their 'sneaker net', though there was little humour in the inconvenience. Now the Parrsboro-based workers and management work in or work remotely from Parrsboro.
- Kerr Heating Products also has a distribution network in the Midwest US, Ontario and US Eastern Seaboard. Broadband allows for improved customer service relations and convenient and timely communications, in addition to the direct delivery of schematics and design application drawings.
- Broadband has meant a new level of service for the Ships Company Theatre. Although both dial-up and broadband would seem to have the same effect on their business practices, the security and reliability of broadband means that on-line bookings can be offered and paid for with fewer disruptions due to the connection breaks that may come with dial-up service. Before broadband, the theatre was never sure if a transaction was completed or not.

- There are a surprising number of local seniors who are using broadband, despite conventional thinking that the technology is geared toward the young. The take-up among older residents has been surprising to Aliant. They want pictures of their families, a virtually impossible feat with dial-up service.
- Local schools and the museums have had broadband access for some time through Ednet, but now there is the opportunity for students to be off the school site and participate in distance education.
- The capacity to conduct small audience training using streaming-video was also highlighted as a benefit to the area. Instructors can be off site and offer distance programs. In particular, there is a new resident who has just located in Parrsboro and is teaching English to students in Asia.
- Broadband has allowed a local land development and survey business to remain in Parrsboro and continue to work throughout the region. This firm had previously employed costly satellite technology to share large files with other locations (base mapping and data overlays). The company has gained contracts with Maritime Gas Pipeline and with the provincial government in setting up the EMO house numbers throughout the Province using GPS technology.
- Those in the local real estate market are finding offshore interest in land is increased if parcels are in broadband coverage areas. Seasonal property ownership is also influenced by the presence or absence of broadband. We heard from two sources that echoed would-be non-resident land owners' preferences for broadband-connected parcels so that they could summer in Parrsboro and remain connected with their businesses elsewhere.
- Health insurance and pharmacy claim validation, was also cited as an example of the benefit of broadband for pharmacies. The local pharmacy has recently been connected to its parent company in Amherst by Eastlink (cable access).
- Only one participant noted a 'downside'. He indicated that the volume of business activity in historical photographs he generated through broadband was more than he could handle on a part-time basis and, as a result, he has withdrawn this service to concentrate on his other initiatives.
- Participants cited the failure of organizations to avail themselves of broadband. An example is the Parrsboro Post Office, which is 'too far down the pecking order' to get funding, even though much of the internal work of the Crown corporation is done over the Internet. Instead, it has three corporate phone lines, whereas one phone line along with a broadband connection would suffice at less cost.

4.3.6 Summary of Parrsboro Impacts

There were 45 respondents to the survey of Parrsboro businesses, 19 of which were broadband users.

- Of the 19 broadband users surveyed, 9 reported increased income from using the Internet (i.e., 47%)
- 4 broadband users reported through surveys and interviews annual Internet revenues totalling $58,000 over the last 12 months
- Of the 19 broadband users surveyed, 7 reported reduced costs from using the Internet (i.e., 37%)
- 6 broadband users were interviewed, 5 of which provided details on cost savings which totalled $37,100 over the last 12 months
- Cost savings categories reported were reduced travel, reduced postage, and reduced cost to reach new markets

The revenues and costs are reported for the preceding 12 months. The businesses reporting can be assumed to have had broadband for no more than 9 of the past 12 months as broadband service was only available starting in November 2005. Therefore, revenue and cost savings from broadband Internet as reported above could be prorated at 75% to reflect 9 months of service.

Employment Impacts of Broadband

- 0.5 FTE jobs retained in Parrsboro
- 140 jobs retained because the presence of broadband was a significant determinant in the largest local employer remaining in the community

5.0 Community Comparisons and Summary

5.1.1 ICT Usage Breeds Need for ICT

In both Churchill and Parrsboro there is a high use of the Internet and broadband to make day-to-day operations easier, reduce costs, reach new customers and generate new revenues. Businesses are able to reach new customers, increase sales, reduce time-to-market, as well as improve coordination with suppliers and customers. Organizations in general (which included public institutions such as government offices and museums), reported that the ability to research and conduct day-to-day operations were made easier using broadband. They also reported that customer service improved and that there is a lot of potential improvement for employee training using broadband.

Study findings suggest that there is a relationship between the perceived need for ICT (including broadband) and the usage of ICT – meaning that those who use ICT have a greater perceived need for ICT and broadband than those who do not. In the study findings, the community that had broadband for a longer period had on average a 7-30% higher response rate for more sophisticated business uses of the Internet with or without online payment, such as selling goods / services (62% for Churchill versus 32% for Parrsboro) and taking customer orders (54% for Churchill versus 47% for Parrsboro). Churchill has had broadband access for the last three years whereas Parrsboro has only had it for the last 9 months. The following is a summary comparison of key broadband user survey results between Churchill and Parrsboro:

- Key uses of the Internet for broadband users

Table 10 – Internet Usage for Churchill and Parrsboro

Internet Use	Churchill	Parrsboro	Statistics Canada[21]
Research	85%	89%	N/A
Selling goods and services	62%	32%	TBD
Purchasing goods and services	69%	74%	42.5%
Web Site	86%	63%	36.8%
Advertising	69%	47%	N/A
Customer orders	54%	47%	N/A
Electronic Document Transfer	62%	74%	N/A

- Key benefits of the Internet for broadband users

Table 11 – Internet Benefits for Churchill and Parrsboro

Internet Benefit	Churchill	Parrsboro	Statistics Canada
Makes day-to-day operations easier	86%	89%	N/A
Improves customer service	79%	68%	N/A
Reach new customers	64%	47%	TBD
Increase sales	50%	47%	N/A
Lower costs	50%	37%	TBD

[21] Statistics Canada E-Commerce and Technology Survey 2004

The difference between Churchill and Parrsboro was smaller, and in fact reversed, for activities such as research (89% for Parrsboro and 85% for Churchill), purchasing goods online (74% for Parrsboro and 69% for Churchill) and document transfer (74% for Parrsboro and 62% for Churchill).

The conclusion to be drawn here is that there is an evolution in the use of broadband for business purposes and perceived barriers are overcome through awareness – and awareness increases over time. Selling goods and services on-line for example, requires a more developed understanding of how broadband can be used because it is initially perceived by business owners to be complicated and/or costly to implement. This was raised in interviews and survey data show that there is a greater use of the Internet for selling goods and services on-line in Churchill (62% versus 32% for Parrsboro).

In the three years that business operators in Churchill have been using broadband, they have developed a greater level of understanding on how to incorporate the Internet into their business processes. Broadband has been an enabler for higher level use of the Internet because of the bandwidth required and the 'always-on' requirements of these activities, broadband becomes a necessity for more sophisticated usage. Businesses that are on dial-up are discouraged from a deeper usage of the Internet because of slower speeds and unreliable connections. In other cases, the technology divide between the business owner and the customer base is also a barrier. Relationships with customers, suppliers and partners have difficulty working effectively if for such simple tasks as document transfer, or staying in constant contact if one party is on broadband and the other is on dial-up.

When access to high-speed Internet service is relatively new there is a learning curve associated with adoption of this technology. It takes time for business owners to understand how this tool can support their business. In Parrsboro, this level of understanding is not fully recognized after only 9 months of availability and, therefore, the full benefits of access to broadband will not be realized until it is sufficiently understood and adopted into the day-to-day business activity. With longer use of broadband, businesses can learn how best to apply the service to suit their production needs. As this is learned over time, the take-up and application will accelerate, as will the accumulation of benefits.

Churchill provides an interesting contrast in this regard. The community's loss of broadband access they once enjoyed resulted in an appreciation of the value of broadband, in the same way that the value of resources are punctuated when that resources are no longer available. Findings suggest that not only did broadband users in Churchill develop a deeper understanding of how to use Internet, but the 'shock' in Churchill of losing broadband caused a higher level of awareness and greater understanding of the value of broadband than would have otherwise prevailed on a more natural learning curve (i.e., relative to Parrsboro).

The policy issue that needs to be addressed is how to generate within organizations a deeper understanding of the business benefits of broadband that will accelerate their adoption of ICT into business processes and day-to-day operations. Specifically, there is a need for education and awareness efforts to focus on specific business level applications of broadband, as business operators 'don't know what they don't know'. Policy should focus on how to raise awareness and support training small-to-medium-sized enterprises (SME).

If government were to undertake activities that support such policy, one solution would be a database of business by business case studies where experiences are collected from BRAND projects and data is recorded on individual business level so that a business owner can query the data base to see how others in their sector have been able to benefit from broadband in their

business. This provides the new broadband users with the opportunity to more readily understand the benefits from 'real world' examples. Lessons learned and best practices from using ICT are much more convincing when they come from peers, rather than trying to interpret potential benefits from general information about applications and uses. Government can complement existing activities in rural and remote regions to accelerate the adoption of ICT with SME's and such options should be explored further.

5.1.2 Technology Divide and Local/Regional Access to Broadband

The use that an organization makes of certain business tools is influenced by the preferences and uses of business tools that are exhibited by their customers and by their suppliers. In the case of ICT and broadband deployment, in a community where the 'footprint' has a relatively small radius, the organization has access to broadband and their local customers and suppliers outside the footprint are in effect not connected. Taking an example from the Parrsboro area, one of the present federal Ministers has his home in Cheverie NS, a few miles southeast of Parrsboro, but on the south side of the Minas Basin. Cheverie does not as yet have broadband access and, according to one of his department's employees, the Minister has to commute 40 minutes to his department's Wolfville office to access large files. Being restricted to dial-up provides access to the Internet, but in terms of functionality some communications simply cannot be accomplished without broadband.

Local businesses within a broadband footprint are able to serve markets in other connected areas and have the opportunity to provide a variety of new service options for the customers and the opportunity to have a range of new suppliers. Nevertheless, organizations in rural and remote Canada tend to focus on their local regional markets and a technology divide within this segment will limit the advantages that would otherwise be realized. Reducing the technology divide for organizations in these regions becomes increasingly important to ensure that their sphere of business activity (i.e. customers, suppliers and partners) also has access to broadband and understand how to use it effectively. To make the point, interviews conducted for this study found that the customer service side of Internet and broadband use was predicated on the technology limitations of the customer. In one example, a rural-based web designer stated that the technology divide in rural areas limits the sophistication of web sites for organizations that are rural-based – even though the business may be on high-speed, most of their rural customers are on dial-up. Using the Internet to 'leap frog' the local supplier and customer base may be advantageous to some, but for others the Internet does little to benefit services to customers who may be more important to the local business but that are outside the broadband footprint.

It must also be noted that the prototypical rural 'business', the farm, is more and more being subject to this urban-rural digital divide. In our work in the Parrsboro area, we heard that many farm products and services are regulated or provided by governments who pride themselves on having gone digital. Unfortunately, most farms cannot easily access the large files and picture-laden government websites with dial-up Internet service. They do not suffer so much from an unwillingness to use the Internet as the inability to access content coming from various sources.

These situations point to the synergies that would occur with more widespread broadband deployment. Web solutions/applications for rural based businesses who themselves may be on high-speed are often limited to the lowest common denominator with respect to the awareness and technological capacity of their clients. Extending broadband to a wider area that includes more of the local customers and suppliers within a rural area will realize more benefits by eliminating technology divides where they exist. Hand-in-hand with the technology is the need for awareness raising and training support so that organizations have the understanding and the

tools to fully leverage the capabilities of ICT into their business processes. Only by taking such a holistic approach can the benefits of the Internet and broadband be fully realized – furthermore, it is not until such activities are coordinated in unison that investments in ICT and broadband will offer a significant positive return on investment.

5.1.3 Job Retention

The focus of the study was to identify the economic impact of broadband on the selected communities - how many jobs were created, what income was generated, what new markets were reached, etc. In some respects the theme that came through concerning these hard economic indicators was more qualitative than it was quantitative. What is definitive is the recurring theme of job maintenance and remaining competitive. In the case of Parrsboro, for some businesses a high-speed Internet connection was a necessity to maintaining their position in the market. Businesses in the service industries are now rated according to their capacity to provide clients access to high-speed. For local bed and breakfast establishments in the Parrsboro area, even holding constant all other service standards, we were told the lack of high-speed means they would not now be able to achieve the 4th star level in the Canada Select Rating System. In other examples, a local metal fabricator was considering business relocation because of the inability to transfer large files over dial-up. Broadband preserved this employment within Parrsboro. Viewed this way, the economic impact on the local community is more about job maintenance than job growth. Therefore, the definitive metrics are the number of jobs that remain rather than the number that are created. Rural population and employment decline is slowed down.

In Churchill, as an example of a different problem, one of the tour companies 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, perhaps, $50 per month paid in a city. Broadband has become the 'price of admission' to operate in a market and those that do not have affordable access to broadband must either pay the difference or potentially lose their local jobs.

5.1.4 Structure of the Rural & Northern Economy

The structure of the rural economy is another interesting determinant on the economic impact results that we are able to obtain. As noted above, job maintenance was a theme in both Churchill and Parrsboro – noting that access to high-speed Internet provided a more 'level playing field' and allows rural based business to remain competitive. The structure of the rural economy also masks the 'job' effect as much of the employment base is within a large number of sole proprietors who often engage in several lines of business to create their employment (many jobs to make one full time equivalent position). The impact of broadband to increase their efficiencies, lower the cost of production, among other things, is diffused over a number of activities, with the resulting difficulty of trying sum up the impact at the job level. Those surveyed and interviewed know broadband is helping them, but they were hard pressed to attach specific performance measures to this.

5.1.5 Challenges in Evaluation

In conducting this study, the research team has made note of some observations around the challenges of evaluating the impacts of broadband. Our methodology has been designed and tested over a number of applications in a variety of rural settings. The questions are designed to extract context and performance measures from individuals who themselves tend not to have capacity to evaluate these impacts.

What has inhibited this process may be addressed with a few extra planning steps during the implementation phase that seeks a more formalized level of cooperation from the service providers who are engaged to deploy broadband. In particular, access to the mailing list of subscribers for evaluation purposes would streamline the process and would allow more project effort to be devoted to data capture and less effort on validating mailing lists. The competitive intelligence of the service provider could be protected by confidentiality agreements that compel obligation on external parties who are conducting the evaluation.

The other impediment has been the relative newness of access to broadband in the areas studied. As indicated, there is a learning curve attached to broadband and the capacity of the users to identify benefits will be impacted by time and the distance they have traveled along this learning curve. Those who are interviewed early on this path will provide a foundation for baseline data, but will tend not to report results that show much growth attributed to broadband as they are still learning how to employ.

Unlike urban centres, rural and remote communities in Canada pose a unique set of challenges and opportunities for conducting research. With smaller demographic bases and predominant small-medium enterprises (SMEs), rural and remote communities require a methodology designed that incorporates these and other important characteristics.

The methodology designed for this project incorporates the pre-determined strengths and limitations noted above. One of the greatest strengths of the methodology is the context through which businesses were able to attribute economic impacts to broadband services. During the interviews, the depth of data collection is considerably higher than if it was asked through a questionnaire. Business owners/managers can be probed for further information regarding attribution of economic impacts. An understanding of the business in relation to broadband and the entire community can be illustrated through these interviews.

The timeline for this economic impact study paralleled the summer tourism season in both communities. As the tourism sector is a significant component of each community, this meant it was sometimes difficult to reach owners/managers. Two businesses declined to participate in high-level interviews not because of a lack of interest, rather, not have the time to speak due to demands of their businesses.

Identifying the economic impacts of broadband was a task many business owners/managers indicated was difficult. Although benefits of broadband were quickly identified by business owners/managers, producing an economic value of these impacts was difficult. In part, this could be attributed to the relative newness of broadband in Parrsboro (Parrsboro was connected to broadband approximately five months ago).

6.0 Conclusions

The original deployment of broadband to areas in Canada had an effect of providing a competitive advantage, particularly to larger firms that worked on a regional, national, or global market. Access to broadband for many now, is about remaining in the game – it is not about competitive advantage but about removing a competitive disadvantage.

The adoption of broadband in everyday life is becoming pervasive. The challenge for rural and remote areas is that they will be left behind if they do not have access to broadband. Not having access to broadband has consequences for businesses. Taking tourism as an example, what was once a selling feature of accommodations is now an expectation and service providers in the accommodations industry are penalized (rated lower) for not having broadband service. Broadband has not only become a necessity for the client, broadband has become a necessity for various business processes such as reservations and accounting. Access to high-speed Internet is becoming a requirement to be in business.

Government policies need to continue to address the growing digital divide in terms of the usage of ICT by organizations and firms in rural and remote areas. The impact of broadband from respondents in Churchill and Parrsboro are as follows:

Summary of Churchill Impacts

Revenue Impacts of Broadband

- $769,000 in revenue generated online by businesses using broadband
- $4,200 decrease in revenue as a result of the lack of broadband

Cost Impacts of Broadband

- $32,000 decreased printing and postage
- $32,400 increase to re-establishing high-speed connection

Employment Impacts of Broadband

- 2.7 FTE jobs retained
- 4.0 FTE jobs outsourced as a result of loss of broadband

Summary of Parrsboro Impacts

Revenue Impacts of Broadband

- $58,000 from Internet sales and reservations by businesses using broadband

Cost Impacts of Broadband

- $37,100 from cost savings from reduced travel, cost savings from reduced postage, and cost savings from new markets

Employment Impacts of Broadband

- 0.5 FTE jobs retained in Parrsboro
- 140 jobs retained because the presence of broadband was a significant determinant in the largest local employer remaining in the community

The following table provides comparative statistics on the impact of broadband on companies in the two communities.

Comparative Statistics on Broadband Impact

Community	Churchill MB	Parrsboro NS	Comments
Population (2001)	963	1529	No road into Churchill
People employed (2001)	590	715	One big company in Parrsboro
Companies surveyed	28	45	
Percent of total employment covered by companies responding	80% (472 employees)	76% (544 employees)	
Employment impacts – jobs retained or supported by broadband	2.7 FTE	0.5 FTE	
Employment impacts – jobs lost/outsourced due to the loss of broadband	4.0 FTE	N/A	
Access to broadband	Got it 2003— Lost it 5/05	Got it 11/04	Churchill lost broadband service after 2 yrs
Most cited use of broadband	Research 85%	Research 89%	
Sales derived from broadband access	$769,000	$58,000	Churchill has experienced users
Respondents used or using broadband in 2005	96%	26%	Parrsboro broadband user base is growing fast
Major benefit from broadband	86% eases day-to-day ops	89% eases day-to-day ops	

Additionally, there are subjective and qualitative outcomes which are not easily measured, especially related to jobs and business activity retained (sustainability as opposed to growth). Despite this challenge it is important to track such economic and social impacts to justify investments made by funding agencies into ICT and broadband, but more importantly for stakeholder organizations to better understand the role of technology and what role it can play to enhance their existing business processes and create new opportunities. Leveraging the benefits of ICT and broadband more fully will require that individual organizations clearly understand which technologies offer returns on investment that are positive – whether they are measured against economic, social or a combination of the two criteria.

It is important that ICT and broadband investments be accompanied by training and assistance in helping organizations develop socio-economic impact uses of broadband. Such investments can be made by government, organizations themselves, or a partnership of the two. Awareness and training accelerate the uptake and utilization of ICT tools and services. For rural and remote regions in Canada to not only be competitive, but to also retain jobs, government policies need to support such activities that promote comparative advantage. ICT and broadband offer new opportunities to respond to the growing competitive challenges and the pursuit of these opportunities must be ongoing as we increasingly compete in a global marketplace.

Overall, the return on investment for broadband in Churchill and Parrsboro has been positive and respondents strongly support future investments in broadening access to ICT and broadband.

Addendum: Recommendations for Further Research

The following are recommendations or considerations that have been constructed based on the experiences of the research investigation.

Multi-method research approach to information/data collection

Through a multi-method of data collection, high quality of data from the business community are achieved. The multi-method approach, a process of using more than one method to collect information/data, allowed a representational view in each of the two communities to be constructed. A wide diversity of business sectors can be reached through the selection/identification of businesses for either method of the data collection

As it was anticipated, business owners and managers had difficulty in providing quantifiable information regarding the impact of broadband service. The follow-up interviews that were conducted provided the opportunity for researchers to probe in greater detail the areas of potential economic impact, as well as qualify responses.

Key informant / high level interviews

As a component of the multi-method methodology, the key informant interviews are able to produce high quality, accurate data from business owners / managers. Through these interviews, researchers can gain meaningful data that is attributable to broadband. The interviews provide the opportunity to gain valuable information that may be lost through other research methods. For example, some respondents in Parrsboro had difficulties in recognizing the benefits of broadband to their organization. This may be partly attributed to the fact that broadband service is relatively new in Parrsboro, with connection only nine months prior to the study.

Broadband impacts framework

For respondents to provide meaningful assessments of the impacts of ICT and broadband, it is important that they have a frame of reference from which they can measure the economic and social impacts their organization has experienced.

A framework is needed to assist policy makers and stakeholder organizations identify the benefits that may be forthcoming from a given broadband investment. The resulting ‘menu of benefits’ and associated definitions for various levels of return provide a tool for government to predict and assess the benefits of broadband projects. Such a framework would also help stakeholder organizations better understand the effects ICT and broadband have on their business processes so that they can make more informed investment decisions. Some recommended objectives for such a Broadband Impacts Framework include:

1. Provide a framework mechanism that will have the capacity to track a variety of diverse criteria that relate to broadband projects;
2. Define the benefits of broadband to communities and the potential returns on investment from budget allocations in support of broadband projects;
3. Provide a list of definitions, indicators and suggested measures for assessing the impact and benefits resulting from broadband; and
4. Provide an outline of a process through which the benefits of a particular project may be identified, from the planning stage and throughout, at any point during the project implementation.

Such a framework would illustrate the types of benefits that can be expected, the possible forms of those benefits, and characterizes the types of impacts from those benefits. To enable policy

makers to use this framework as a tool, the modular components of the framework can be applied within the context of a particular project and its unique socio-economic circumstances. Detailed analysis of specific businesses as "case studies" within a case study could provide further assessment of economic and social impacts.

Timeline

To capture economic impacts of broadband on rural and northern communities, it would be advisable to have a longer time period for collection of the data, especially when working through summer months when people are difficult to reach. The ability to work with local businesses over a longer time period would be helpful in analyzing the economic impacts.. It would be desired in future economic impacts studies to be sensitive to the time of year in which data is collected. During certain periods throughout the year, which are often different by each community, there are time periods that are more advantageous than others. In southern communities, for example, the spring and fall months are better times to contact people as business activities peak in the summer. In northern Manitoba, the summer months are met with tourism season and people are on the land.

Time period

Based on the high-level interviews conducted, many business owners indicated that their economic impacts would be considerably different dependent on the time period. Different impacts may be realized at 6, 12, 18, 48 months. A longer time period would allow for all of these impacts to be assessed.

Economic impact of job retention

The business communities of both Churchill and Parrsboro echoed the sentiment that broadband Internet services have not created new jobs in the community as much as they have allowed for job retention. Businesses have indicated that broadband has allowed them to maintain the pre-existing number of jobs prior to the introduction of broadband in the community. Many of the businesses indicated that broadband has been an engine of sustainability, not an engine of growth.

Use of a control group

To assist in evaluating the economic impacts of broadband service in rural and remote communities it would be beneficial to study a community without broadband services as a 'control group'. This control group community could be utilized to assist in the assessment of impacts of broadband.

Challenges in identifying impacts and value

Business owners/managers have not necessarily thought of about the economic impacts of broadband. In Churchill, a business owner indicated that his business uses less paper now that they have broadband. Unfortunately, the manager indicated that the he had no idea of how much money has been saved through the reduction of paper. If he had time, he could possibly go over the receipts from past years to calculate the savings, but this is not something that he recognizes. The impacts of broadband became apparent in Churchill with the loss of the service.

Larger economic situations mask broadband

Marco-economic conditions are that occurring beyond the communities have masked the impact of broadband. It has been estimated that the tourism sector has suffered a decline of between 5-20% this season. For both Churchill and Parrsboro, tourism is a significant sector of their economies.

Appendices

A. Community Endorsements

As a result of the interest and support from local stakeholders for both the Churchill study and the Parrsboro Study, we were able to obtain endorsements from high ranking organizations/officials in each study area. In the case of Parrsboro, the Cumberland Regional Economic Development Association (CREDA) and the Town of Parrsboro provide the following endorsement of our process:

> CREDA is working with Dalhousie University and Industry Canada to assess the impacts of Broadband (High-speed Internet) for businesses and organizations in our community. We will be conducting a brief telephone survey of all businesses and organizations in Parrsboro over the next two weeks to get your input on how Broadband has, or is expected to, impact your operations. The results of this survey will allow us to better understand the value of Broadband to our community of users and how broadband benefits local economic development. We are sending this email to inform you of this activity and to request your participation in this very important survey. We appreciate your time and cooperation in responding to this survey when you receive our call. - - - *Mr. Ron MacNutt, Broadband Administrator, CREDA*

This endorsement was proposed to be e-mailed by CREDA to business within the Parrsboro Study area prior to the commencement of the survey (Monday, July 18th, 2005). However, due to incomplete e-mail lists, Mr. Ron MacNutt of CREDA has coordinated with the Town of Parrsboro to spread the word about the upcoming survey through various local business associations and to solicit participation and support.

A similar endorsement was provided by Town of Churchill as follows:

> The Town of Churchill is working with Brandon University and Industry Canada to assess the impacts of Broadband (High-speed Internet) for businesses and organizations in our community. We will be conducting a brief telephone survey of all businesses and organizations in Churchill over the next two weeks to get your input on how Broadband has, or is expected to, impact your operations. The results of this survey will allow us to better understand the value of Broadband to our community of users and how broadband benefits local economic development. We are sending this email to inform you of this activity and to request your participation in this very important survey. We appreciate your time and cooperation in responding to this survey when you receive our call. If you have any questions, please contact the Brandon University at (204) 571-8552. - - - *Tammy Joyce, Administrator, Churchill Chamber of Commerce*

The survey endorsement was disseminated by the local Chamber of Commerce to their membership through both facsimile and e-mail.

As another form of awareness generation, the individuals within Churchill and Parrsboro, respectively, who had provided support to our proposals also engaged in their own form of promotion of this study. In the case of Parrsboro, a representative of CREDA presented to the Parrsboro Town Council our research project and invited council and local business people to spread the word that this process was ongoing. CREDA also used this occasion to invite those contacted to participate in the process. A similar approach was followed in Churchill.

B. Literature Review

Documents and websites that were included in the literature review include:

- Amherst Daily News (2005). *Amherst Daily News*. Retrieved 8 July 2005 from www.amherstdaily.com.
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C. Survey Results for Churchill, Manitoba

Of the 73 surveys completed for this study, 28 were from Churchill. Of these, 14 respondents are former or current broadband users. It should be noted that the organization surveyed represent a total employment base of 472 employees with an average size of 17 employees per organization and a median of 7.

The following table shows the breakdown of respondents by industry.

Churchill Survey Respondents by Industry

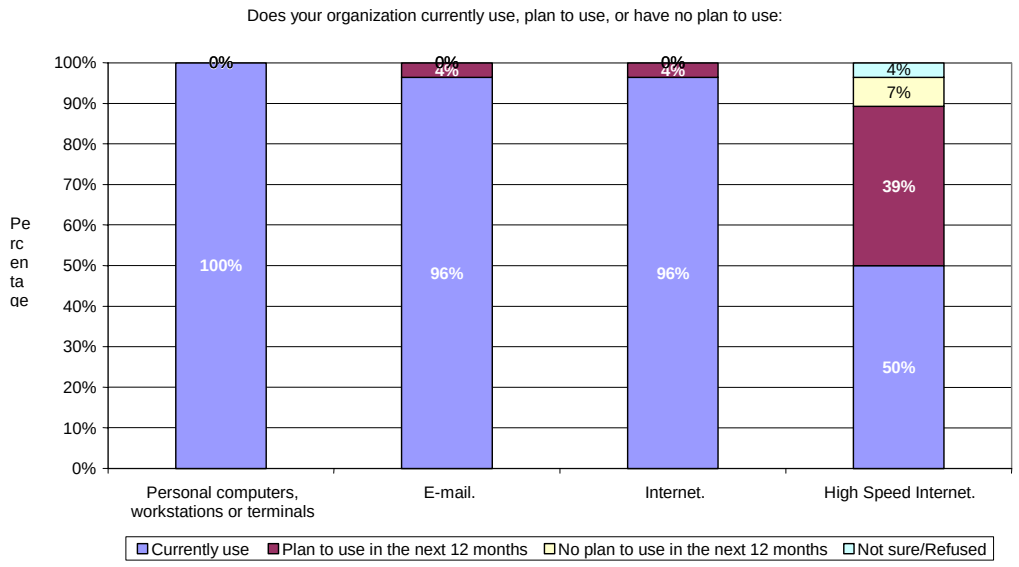
Retail Trade	4
Arts, Entertainment and Recreation	1
Tourism, Accommodation and Food Services	9
Finance and Insurance	1
Professional and Technical Services	1
Educational Services	2
Health Care and Social Assistance	1
Government	4
Transportation and Warehousing	1
Other	4
TOTAL	28

What Organizations are Using

The following figures show the number of organizations currently using, or in the next 12 months planning to use or not planning to use:

- Personal Computers, workstations or terminals
- E-mail
- Internet
- High-speed Internet

Figure 5 - Churchill Organizations Using Computers, E-mail, and Internet



All Churchill organizations surveyed currently use (96%) or plan to use (4%) the Internet in the next 12 espondents were asked if the had used High-speed when it was available. Those that had used Hmonths. It should be noted that High-speed Internet recently became unavailable and therefore righ Speed are summarized in the chart as “currently use”.

For Churchill, a large number of organizations provide direct access to computers, e-mail, and Internet to more than 75% of their employees. 64% provide direct access to computers, 70% provide direct access to the Internet, and 67% provide direct access to e-mail.

Communication Methods

67% of respondents rated e-mail as essential or very important method of communicating with customers, second only to telephone contact (71%). However, e-mail is considered of less importance for communication with suppliers. 41% consider e-mail essential or very important for supplier communications vs. 57% for telephone and 39% for fax.

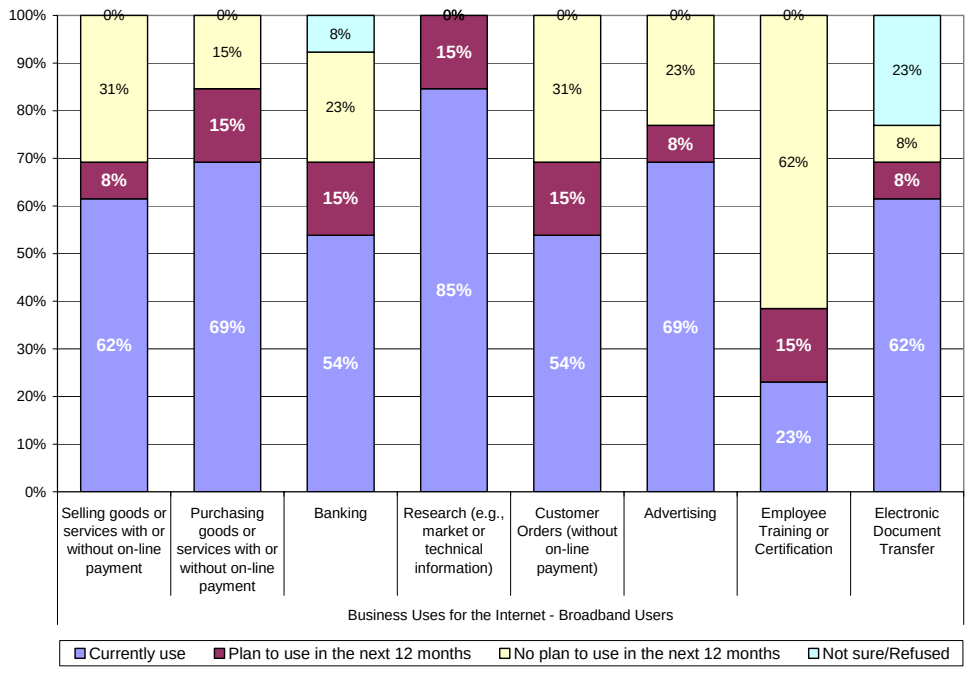
Business Uses of the Internet

Organizations were asked to identify their business uses of the Internet from the following categories:

- Selling goods or services with or without on-line payment
- Purchasing goods or services with or without on-line payment
- Banking
- Research (e.g., market or technical information)
- Customer Orders (without on-line payment)
- Advertising
- Employee Training or Certification
- Electronic Document Transfer

Respondents were asked to identify if they are currently using, plan to use, or have no plan to use these capabilities. The results from broadband user responses are summarized below.

Figure 6 - Churchill Current and Planned Uses of the Internet



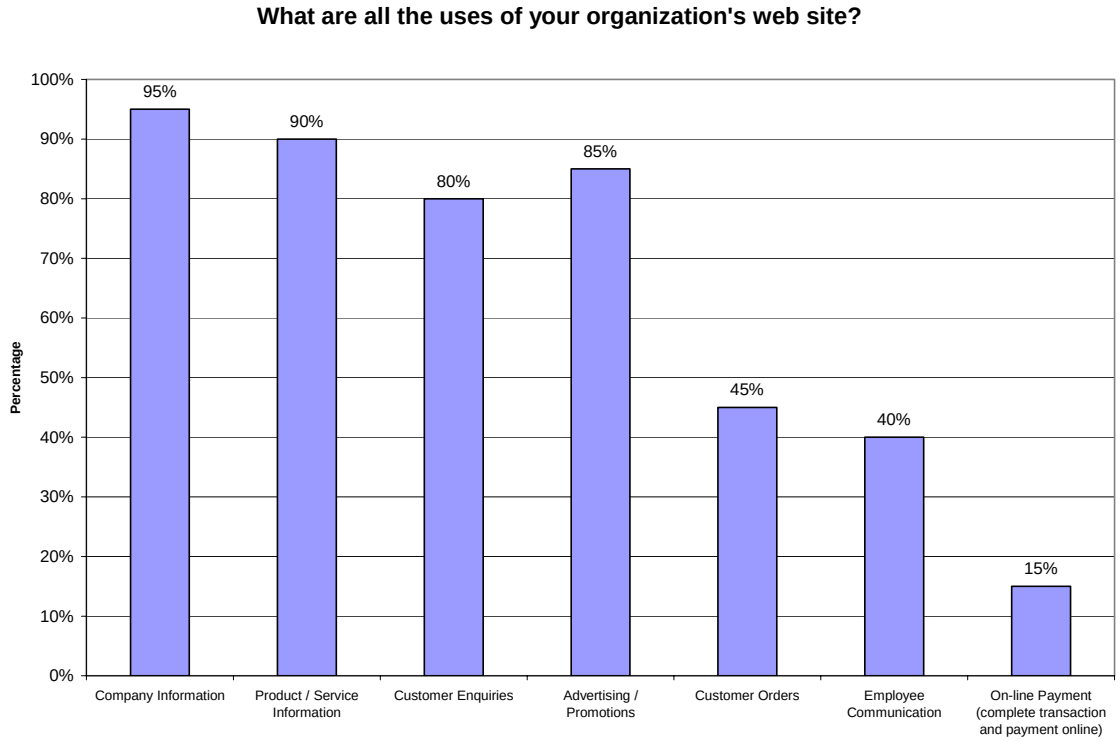
The number one business use of the Internet is for research, with reported use by 85% of organizations. A large number of organizations use the Internet to purchase (69%) or sell (62%) goods and services over the Internet. 69% advertise over the Internet and 62% use the Internet for electronic document transfer. With the exception of research, these statistics are significantly higher for broadband users than for dial-up users of who 46% reported buying or selling goods and services, 54% advertising, and 46% electronic document transfer.

Six respondents reported a total gross sales over the Internet of $795,000 in the past 12 months. Five of these businesses are former broadband users, and 2 are continuing to use high-speed access generating a combined **gross revenue of $400,000 in the past 12 months**.

Organizations that have Web Sites

In Churchill, 71% of organizations reported having their own web site. Of those, 45% manage their own web site. Of those without their own web site, reasons cited were; cost of developing and maintaining a site, security concerns, and not needed for products and services. Only one organization said that the Internet was too slow for a web site.

Figure 7 - Uses of Organization Web Site - Churchill

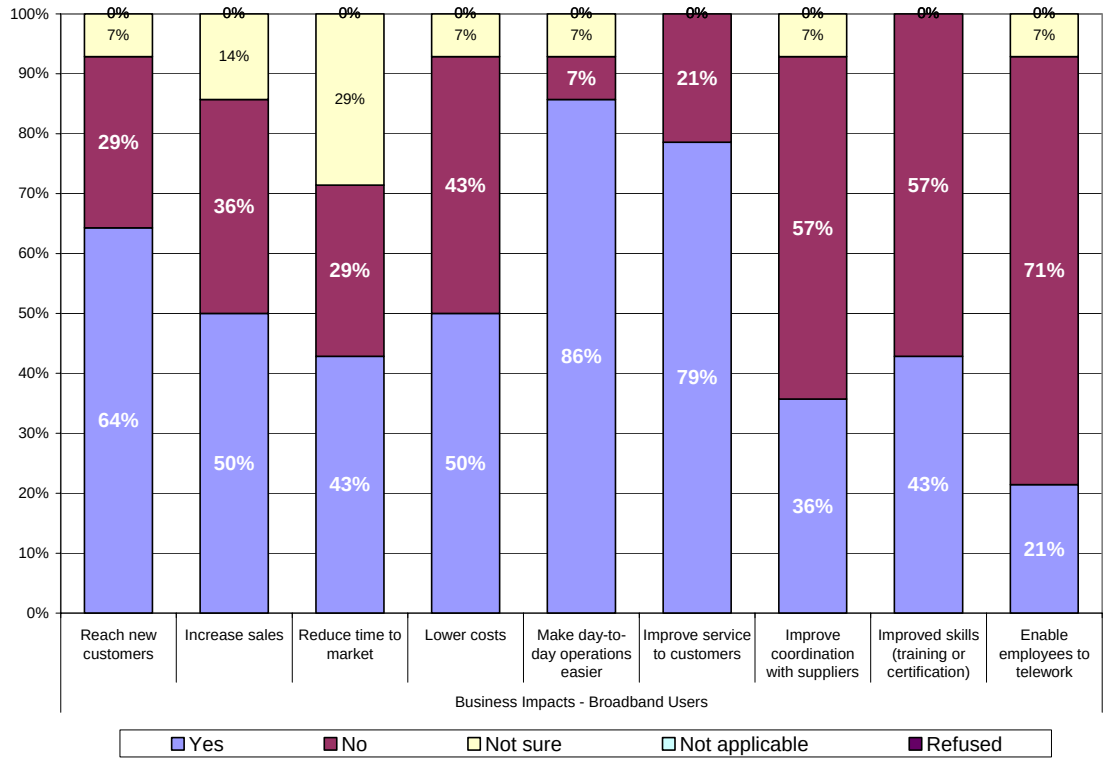


The predominant uses of the organizations' web sites are for providing information about the organization (95%), its products and services (90%), advertising and promotions (85%), and for customer enquiries (80%). 45% use their web site for receiving customer orders but only 15% actually take on-line payments through their web site.

Benefits from the Internet

Respondents were asked to identify all of the ways their organization has benefited from the Internet within the past 12 months amongst a selection of categories. The following chart shows the response from those respondents who are broadband users:

Figure 8 - How Churchill Organizations Benefit from Using the Internet



Of broadband users, 79% reported receiving at least one of the benefits categories, with 5 being used on average. By far, the most significant benefit for Churchill organizations is making day-to-day operations easier (86%), followed closely by improving service to customers (79%). However, there is also a very clear perception that the Internet is a benefit for reaching new customers (64%), increasing sales (50%), lowering costs (50%), and reducing time to market (43%).

The following is a sample of statements made by respondents when asked to “describe the ways in which your organization benefits from the Internet”:

- It makes it easier to communicate with both the public and within the agency. It is strictly a communication benefit.
- Rather than explaining over the phone customers can just look on the website, information on different branches, it gives them a better picture of what we do.
- Communication. Easy to purchase orders. Employees can look up parts. Technical support online.
- We can communicate faster with companies because we deal with people overseas so we can do it over the Internet.
- Advertising, communicate with a customer on a product that you can't see in person. Everybody is getting into computers and customers find it easier to deal with it that way.
- We have links through other places so people can email us. Mostly email.

- Because our business has seven offices across Canada so we communicate by email.
- We have Internet access to what we do but it's through the Canada employment centre, HRDC, Human Resource Development Canada. Filling out forms and stuff online. They already have that. We can fill out applications online but it's not connected to this office, it's connected to the HRDC office.
- Customers can get information if they need it and what services the government offers.
- You can use it anytime and it is faster. When you can contact customers it is faster you can just leave them a note.
- Basically we live in a remote community and it's difficult to do research and that type of work so the Internet makes it a whole lot easier.
- We have a link to all information that pertains to tourism. For example we have links to the Churchill Chamber of Commerce, which gives people coming in information on all that we've got here.
- Cataloguing. We do research with the Library of Congress in the US. We have different enquiries to our collection. The customer information to the north. Responding to some people's enquiries. Sometimes our objects are on loan and we communicate back and forth. Product enquiries for the gift shop. Checking out addresses. If something hasn't arrived we may fax or email to see when it's going to come.
- We have developed a dynamic website that is interactive and allows clients to review a huge amount of product offerings and choose the best option for them from a large number of options. Our staff online get product information as well as access to online training manuals.

The following is a sample of statements made by Churchill respondents when asked "What would you like to be able to do with the Internet that your organization is not doing now?"

- More time on the Internet.
- Describe our services a little bit better.
- Create less paperwork
- Just be able to download websites a little bit faster for ordering.
- More advertising, more marketing. If we had high-speed Internet it would be nice. It would make my job quicker.
- Pretty much got it covered. It suits my needs already.
- On-line flyers, better product information, communication. I want high-speed Internet back.
- High-speed would be best. It would allow me to work faster, receive my emails faster, be available all the time.
- Have higher speed so I can do more.
- I would like to find a way to publicize my website at a low cost.
- Greater speed and capacity would be essential for things like teleconferencing and such.
- Have it accurate and up to date every day.
- More online banking.
- A web page.
- We had the can com last year that was transmitted to the office and we distributed that by wireless. It was acceptable but not as good as it should have been. We need DSL minimum capacity. We have not taken the MTS dialup because it is useless for us and we

are in the process of installing our own interface with MTS with our own router to deliver high-speed to our church hill location at great expense. I think that our government should take care of the remote communities to make sure they at least DSL capabilities for all communities.

D. Survey Results for Parrsboro, Nova Scotia

Of the 73 surveys completed for this study, 45 were from Parrsboro. Of these, 19 respondents are current broadband users. It should be noted that the organizations surveyed represent a total employment base of 544 employees with an average size of 12 employees per organization and a median of 5.

The following table shows the breakdown of respondents by industry.

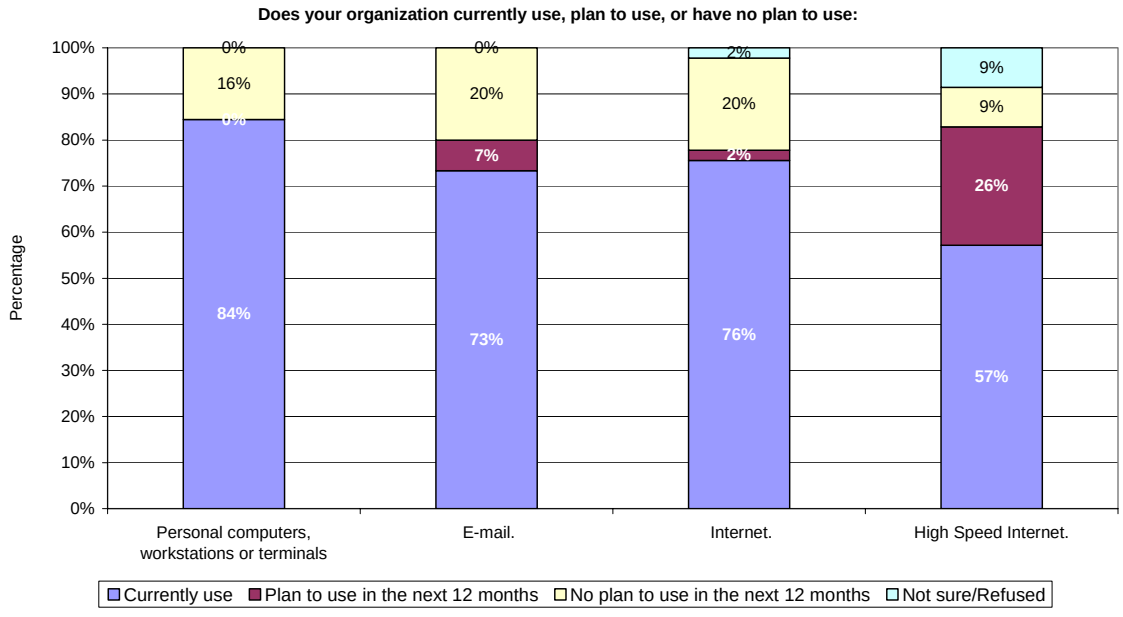
Agriculture / Forestry / Fishing	5
Retail Trade	7
Manufacturing / Processing	3
Arts, Entertainment and Recreation	1
Tourism, Accommodation and Food Services	12
Professional and Technical Services	4
Health Care and Social Assistance	3
Utilities	1
Other	9
TOTAL	45

What Organizations are Using

The following figures show the number of organizations currently using, or in the next 12 months planning to use or not planning to use:

- Personal Computers, workstations or terminals
- E-mail
- Internet
- High-speed Internet

Figure 9 - Parrsboro Organizations Using Computers, E-mail, and Internet



Of Parrsboro organizations surveyed, 76% currently use the Internet with an additional 2% who plan to use it within the next 12 months. Of those using the Internet, 57% of organizations are currently using High-speed, and that percentage is expected to rise to 83% in the next 12 months.

Communication Methods

Only 39% of respondents rated e-mail as essential or very important method of communicating with customers, placing e-mail as third in importance behind telephone contact (73%) and in-person contact (69%) methods. For Parrsboro respondents, the telephone is by far the most important method for communication with suppliers. 62% consider telephone contact essential or very important for supplier communications vs. 26% for fax and only 18% for e-mail.

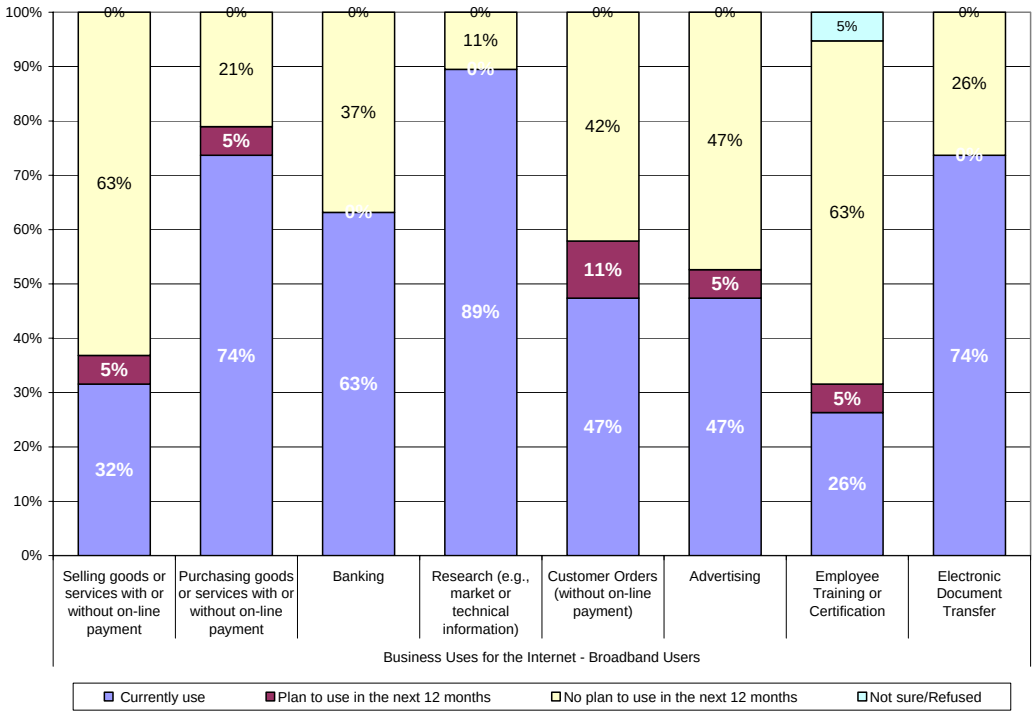
Business Uses of the Internet

Organizations were asked to identify their business uses of the Internet from the following categories:

- Selling goods or services with or without on-line payment
- Purchasing goods or services with or without on-line payment
- Banking
- Research (e.g., market or technical information)
- Customer Orders (without on-line payment)
- Advertising
- Employee Training or Certification
- Electronic Document Transfer

Respondents were asked to identify if they are currently using, plan to use, or have no plan to use these capabilities. The results from broadband user responses are summarized below.

Figure 10 - Parrsboro Current and Planned Uses of the Internet



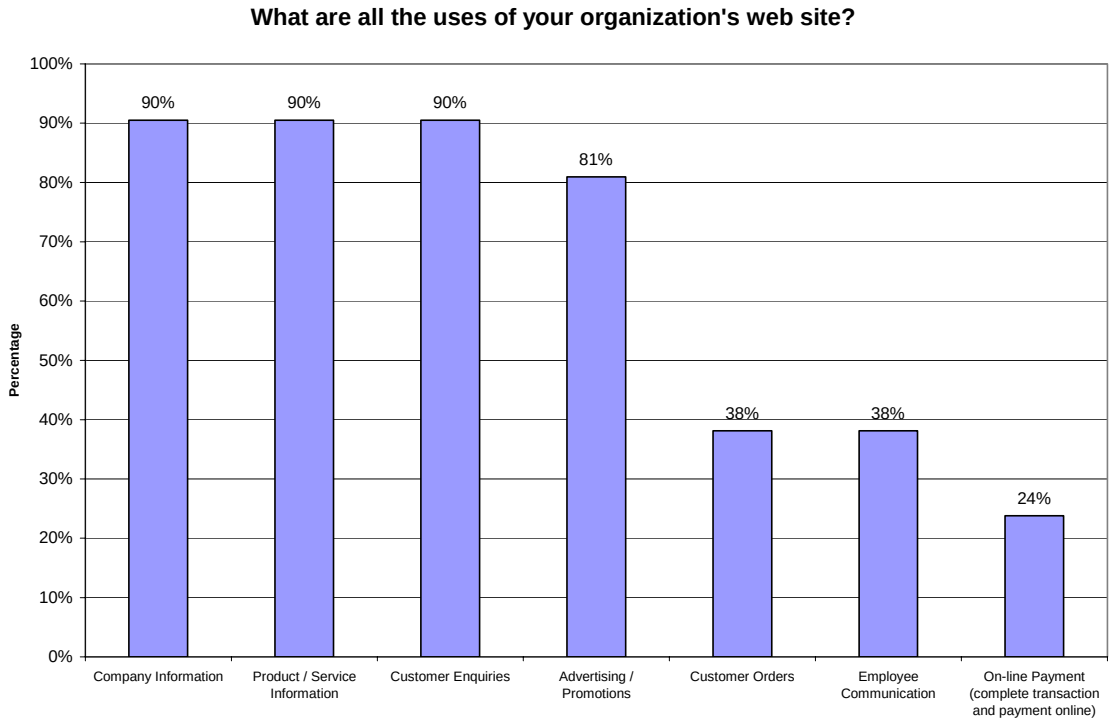
The number one business use of the Internet is for research, with reported use by 89% of organizations. On-line purchasing and electronic document transfer are the second most used application by 74% of organizations. Of significance, only 32% of businesses sell goods or services over the Internet, and 63 % have no plans to do so within the next 12 months. Similarly, only 47% of businesses use the Internet to receive customer orders, and 47% have no plans to use on-line customer orders within the next 12 months. However, with the exception of research, these statistics are significantly higher for broadband users than for dial-up users, of whom 27% reported selling goods and services, or 53% purchasing goods and services, 13% taking customer orders, and 33% electronic document transfer. While use by broadband users is significantly higher in these categories, the data points to an underutilization of the Internet's potential for these organizations.

Of those respondents who reported selling goods or services over the Internet, the aggregate gross sales from the Internet over the past 12 months totaled only $26,000.

Organizations that have Web Sites

In Parrsboro, 60% of organizations reported having their own web site. Of those, 67% manage their own web site. Of those without their own web site, organizations cited security concerns or an uncertainty of the benefits of a web site for their organization.

Figure 11 - Uses of Organization Web Site - Parrsboro

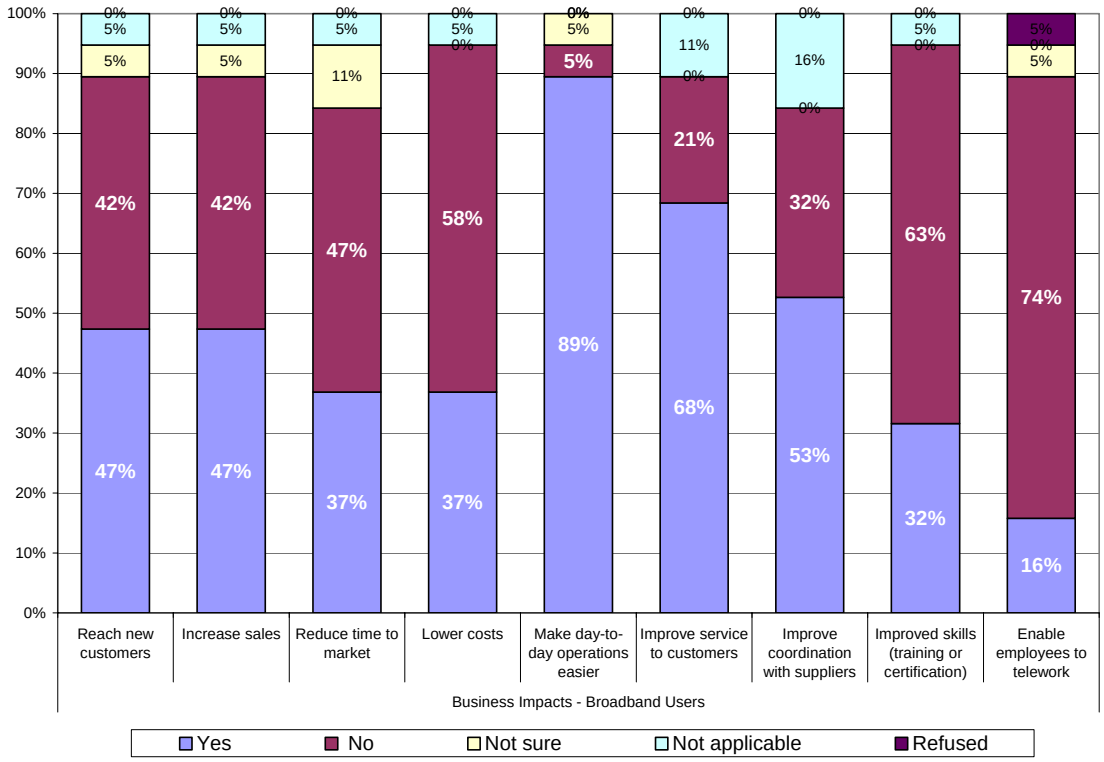


The predominant uses of the organizations' web sites are for providing information about the organization, its products and services, customer enquiries, and for advertising and promotions. Only 38% use their web site for receiving customer orders and 24% actually take on-line payments through their web site.

Benefits from the Internet

Respondents were asked to identify all of the ways their organization has benefited from the Internet within the past 12 months amongst a selection of categories. The following chart shows the response from those respondents who are broadband users:

Figure 12 - How Parrsboro Organizations Benefit from Using the Internet



All broadband users reported benefiting from at least one of the benefits categories, with 4.5 benefits reported on average. The clear number one benefit category is making day-to-day operations easier as reported by 89% of Parrsboro organizations. This is followed by improved service to customers (68%). A slight majority reported that the Internet has helped them improve coordination with suppliers (53%). However, less than half reported that the Internet has helped them reach new customers or increase sales (47%). Only 37% report that using the Internet has reduced costs, while 58% report that it has not. The fact that a minority of organizations report that the Internet has improved skills or enabled employees to telework is most likely a result of these benefits being realizable by only certain types and size of business.

The following is a sample of statements made by respondents when asked to “describe the ways in which your organization benefits from the Internet”:

- I'm a teleflorist so companies call me and I go on the Internet and I get an idea of what they want. I do research on new ideas for the flower industry and new things people are looking for. Sometimes I check out things that are available for purchasing even if I don’t purchase them on the Internet.
- It just brings us on one even bracket with everyone else. Everyone seems to be connected to the Internet and working on the Internet so we wanted to do the same thing. We're also on this community website which enables us to link with other museums and keeps us better informed about the goings-on in the community.
- Easy access to information.

- It is just an electronic way for the retreat to introduce it's self to prospective guests. I sure would like to have high-speed Internet.
- It gives the worlds most current and up to date encyclopedia of everything that you need at your fingertips. We can work no matter where the client is located.
- Advertising gives us access to the public domain.
- Time efficient
- We take Internet because it's easier.
- If we do try to buy gear or anything else from people we can go to the Internet and get a rough idea of what it is worth so that we know the cost that we should be charged.
- The Internet does very little for our company based on the business and the size of our town.
- It's a time-efficient and cost- efficient method of dealing with all these things. You can do everything from home and you can reach a wide market.
- It just puts the world at your fingertips.
- Able to forward information from one facility to another quickly and in an accessible manner.
- For looking up parts on the Internet.
- Through sharing of information.
- Just because of what is available
- We have been able to take part in online workshops.
- We have online information to help service people in the field have current information on our products including set-up information which allows us to participate in online industrial training to meet the needs of our training work force without bringing people in here. We can have inside IT issues addressed from outside via the Internet.
- In terms of being able to do research on the Internet and to provide documentation to other organizations that would make them choose us to do services for them. For example when we are doing proposals we can send them out in PDF format and they are there instantly.
- The Internet for us is used mostly if we need to buy more than sell our services. If we are looking for something we may use the Internet to find it. For our services, we have a certain cliental we work for. We don't have to search for more work.
- We're not in the lions club all the time but with the Internet everyone can communicate with us. You've probably called here many times but we're only here on a Tuesday evening. People can find us and get a hold of us more easily.
- It provides access to more people outside Canada.

The following is a sample of statements made by Parrsboro respondents when asked “What would you like to be able to do with the Internet that your organization is not doing now?”

- The employee training.
- Expand.
- Website
- Have high-speed Internet
- Make it more accessible to everyone
- Being able to get on it whenever you want. Many times with dial up you want to go on and it is very slow or you just can't get on.

- Take online reservations for our rooms.
- To have more personal contact with clients through Internet.
- I would like to look up information on new styling products and upgrading courses.
- The online banking
- Access any information that we require at a certain time. Any questions that we want to know as far as pricing for cattle, strawberries and blueberries.
- We would like to have high-speed so we could use it for more stuff. We can't use this system for supplies and stuff like that. You can't find it without high-speed. It would take you a day to get anything. We don't even bother.
- Go out world wide because it is a closed unit, worldwide access.
- I'd like to use it for more communication between suppliers and ordering material for the lions club.
- To get a web page up and running.

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