



Connecting B.C. Communities

A Handbook for Local and Regional
Internet Service Provider Applicants

NetWork BC and TELUS thank the following individuals who have contributed to this document:

Sue Hanley, First Nations Technology Council
Phillip Djwa, British Columbia Community Connectivity Co-operative
Chris Thomas, First Nations Technology Council
Matthew Asham, BC Wireless Project
John Rowlandson, Inter Tribal Health Authority
Hans DeBruyn, Okanagan Technology Consulting Inc.

Version 6.0

Last Updated March 23, 2006, Copyright 2005, 2006 Province of British Columbia

This handbook was prepared to familiarize the reader with commitments made by TELUS and the Government of B.C. to make certain Internet services available to ISPs in designated B.C. communities. It is not an offer to provide services, nor a comprehensive guide to the issues and concerns an ISP applicant will need to address if it wishes to resell certain TELUS Internet services in B.C. It is recommended that all potential ISP applicants conduct their own research and consult with the appropriate professionals when developing their applications.

By its nature, this handbook requires TELUS and the Government of B.C. to make certain assumptions that may not prove to be accurate. The establishment of a business involving the resale of ISP services is subject to inherent risk and uncertainties and readers of this handbook are advised not to place undue reliance on the information contained herein as a number of factors not mentioned in this handbook could materially impact the potential success or failure of any such venture. TELUS and the Government of B.C. disclaim any responsibility or liability whatsoever for any reliance placed on the information contained in this handbook or any intention or obligation to update any information contained herein.

TABLE OF CONTENTS

INTRODUCTION	4
BACKGROUND.....	4
THE AGREEMENT	4
WHAT DOES THE CCA MEAN TO ME?	5
WHAT IS THE PRICING FOR THE CCA?	5
WHAT SHOULD I DO NOW?.....	9
STEP #1: GATHERING BACKGROUND INFORMATION	10
STEP # 2: DETERMINE THE POTENTIAL CUSTOMER BASE AND EXISTING INTERNET USERS / CONNECTIONS	11
STEP #3: GETTING HELP	12
STEP #4: DETERMINING START-UP AND OPERATING COSTS	14
ARE THERE ANY FUNDS AVAILABLE FOR THE LAST MILE?	18
NOW WHAT?	18
SUMMARY	18
Appendix I - Where can you go for help?	19
Appendix II – Glossary	21
Appendix III – Sample Business Plan	23

Introduction

In April 2005, the Government of British Columbia and TELUS Communications Inc. (TELUS) entered into an agreement to bring broadband access points to 119 B.C. communities by the end of 2006. The Connecting Communities Agreement is part of the Province's plan to provide British Columbians in rural and remote communities with better access to the economic, health and education opportunities that affordable broadband Internet service makes possible.

In addition to the 119 communities covered by this agreement, another 29 communities will be connected by high-speed satellite. Visit www.network.gov.bc.ca to see a list of all the communities. The Province's goal is to bring broadband to all communities that have either a school, library or health facility by the end of 2006.

Until recently, a large number of rural communities throughout B.C. have not had the opportunity to provide cost effective high speed broadband access to community residents. TELUS intends to enter into agreements with regional service providers to offer affordable facility pricing models to enable last mile connectivity to individual homes and businesses. .

This handbook is intended to assist local and regional service providers in developing a business plan to become an ISP for one or more of the 119 communities. The handbook also defines eligibility criteria and outlines the business plan elements that are required for an application to be considered and assessed. To assist applicants, the handbook also provides a sample business plan template for a typical community. This template is intended to be used by those applying to become an ISP for one or more Digital Divide communities.

Background

The Agreement

The Government of B.C. and TELUS recently entered into the Connecting Communities Agreement.

Connecting Communities Agreement (CCA)

Under the Connecting Communities Agreement, TELUS will upgrade existing facilities, construct new facilities and significantly improve services to unserved communities in B.C.

Within the CCA, there is a clear commitment and schedule as to when and how each community will be connected. This will be completed without any additional financial contribution by the Province. Although communities and local ISPs are still responsible for their own last mile connections from the central community access point to individual homes and businesses, TELUS will ensure that access to affordable, high speed Internet service is available to eligible ISPs.

For more information on the agreement, visit the Government of B.C. and TELUS Connecting Communities Web site at www.telus.com/connectingcommunities.

Other useful links: www.network.gov.bc.ca
about.telus.com/digitaldivide

What does the CCA mean to me?

The biggest technical and business challenge in deploying broadband to a community is finding a gateway or open access point of presence with sufficient capacity and at a price that will support a sustainable business case.

Until the CCA, the cost of providing this gateway to rural and remote communities was often very expensive. As part of the CCA, each eligible community will have an affordable price for Internet connectivity, thereby removing the price barrier for developing a sustainable business plan.

This handbook is intended to assist local and regional service providers in developing a business plan to become an eligible ISP for one or more of the 119 unserved communities. An eligible ISP is defined as a local or regional Internet access service provider that:

- Intends to provide local high speed Internet access services to end users in unserved communities;
- Demonstrates ownership/control of infrastructure and resells to more than one end user in a single community; and,
- Is not affiliated or partnered with a telecommunications provider other than TELUS

What is the Pricing for the CCA?

Affordability Pricing Model

Through the CCA, TELUS has committed to providing a minimum Ethernet 10 (E10) connection or equivalent to all 119 unserved communities in B.C. The table on page 6 lists the pricing structure for the E10s. There are no one-time charges for provisioning the E10 facilities under the Affordability Pricing Model (APM).

TELUS offers two services to support E10 connectivity – Carrier Internet Managed Services (CIMS) and Carrier Wide Area Network (WAN) Service. ISPs can purchase either service, depending on their network configuration requirements and the number of communities they intend to serve.

1. Carrier Internet Managed Service

Carrier Internet Managed Service provides a bundled E10 access and 2 Mbps of Internet service. Carrier Internet Managed Service may be a more cost effective solution for ISPs who intend to serve a single location or a few community locations.

Carrier Internet Managed Service is a managed network service used for a single LAN interconnection to the Internet, using the Internet Protocol (IP). The service is provisioned from the TELUS core network and includes local Ethernet over a dedicated fibre. The service will be provisioned in accordance with IP addressing and routing standards.

Carrier Internet Managed Service is provisioned from the TELUS Point-of-Presence (PoP) and terminates on a Customer Interface Unit (CIU) at the ISP site. The CIU will be equipped with one 10BaseT port for connection to the Customer's Local Area Network (LAN) equipment. The service demarcation will be at the interface port on the CIU.

TELUS will be responsible for the installation and management of the service up to and including the service demarcation. The ISP is responsible for any equipment or facilities required to complete the connection between the service demarcation port and the ISP LAN. TELUS does not provide any equipment or facilities required to adapt or connect the service to the ISP LAN.

2. Carrier Wide Area Network (WAN) Service

Carrier WAN Service provides a cost-effective solution for ISPs who intend to serve multiple community locations.

Carrier WAN service provides bridged Ethernet connectivity between specified end customer LANs and ISP backbone networks. The service provides a cost-effective means for sophisticated ISPs to extend their own network and seamlessly create WANs for their end customers. The ISP would normally supply a routing device (router) at each Carrier WAN access site. Each ISP must provision at least one Carrier Network Interface (CNI). The CNI would normally be located at the ISP head office.

If the ISP already has purchased a TELUS CNI, the same CNI could be used for connecting additional communities. If the ISP does not have an existing CNI, a one-time charge of \$2500 and a monthly recurring charge of \$2500 will apply.

As mentioned above, the ISP would normally supply their own routing device. Having control over the routing device is desirable for a variety of reasons, including the ability to offer enhanced services to the community.

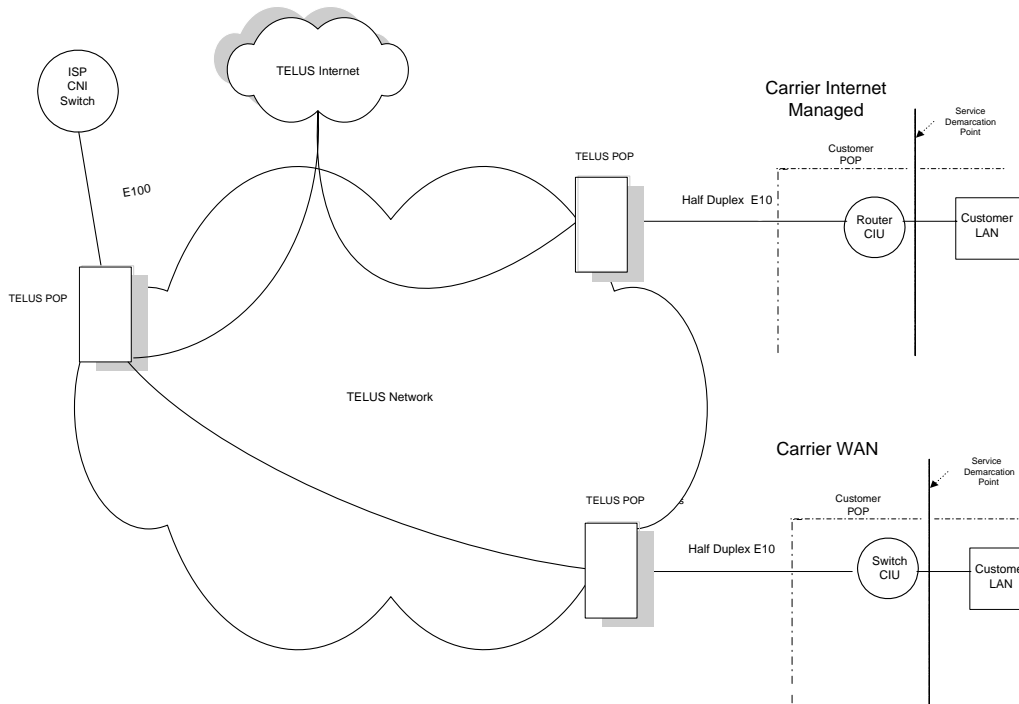
It is also important to note that TELUS will start provisioning the connectivity between the Community Central Offices and the ISP Point of Presence as soon as a signed contract and firm order is received from the regional ISP. Depending on the engineering and provisioning requirements, some locations may require up to 12 weeks to complete installation.

3. TELUS Internet Bandwidth

The ISP that purchases TELUS Internet bandwidth must comply with the TELUS Acceptable Use policy, which is subject to change without notice. The most current version of the TELUS Acceptable Use policy is at www.TELUS.com/aup on the Internet.

Affordability Pricing Model Three Year Contract Term	Network Capacity	Monthly Price
Carrier Internet Managed: Routed		
Population: 0 to 200	E10 half duplex	\$150
Population: 201 to 500	E10 half duplex	\$300
Population: 500+	E10 half duplex	\$450
Internet, 2 Mbps		Included
Additional Internet, each Mbps		\$200
Carrier WAN: Bridged		
Population: 0 to 200	E10 half duplex	\$150
Population: 201 to 500	E10 half duplex	\$300
Population: 500+	E10 half duplex	\$450
Internet, each Mbps		\$200

Carrier Internet Managed and
Carrier WAN Service Architecture



The diagram above illustrates the configuration of Carrier Internet Managed, Carrier WAN and Internet Connectivity.

How does this pricing work relative to my community?

The Affordability Pricing Model depends on the population of the community or delivery area from the ISP PoP. The following sample pricing model demonstrates the impact of this pricing arrangement:

Sample Assumptions:

- **Network Charges:** This example assumes that the ISP's service area population is 320 persons. This means that the ISP is eligible for the E10 price of \$300 per month.
- **Internet Charges:** In this example, the ISP purchases Carrier Internet Managed Service to serve a single community. Two Mbps of Internet bandwidth are included with this service. If the ISP decides to purchase additional Internet bandwidth, a charge of \$200 per Mbps would apply.
- **Revenue:** To illustrate the potential revenue and gross margin that an ISP can achieve over time, we have assumed a community population of 320 with an average of four people per household. The \$300 monthly recurring cost is fixed, so, as the customer base increases from 10 percent to 50 percent, the ISP's revenue and margin increases, while the monthly cost remains the same.

Three-Year Contract Rate

	YEAR 1	YEAR 2	YEAR 3
Community Population	320	320	320
No. of Households	80	80	80
Take Rate (1 Internet per household)	15%	30%	50%
No. of Customers (c)	12	24	40
Customer Monthly Price (cmp)	\$35	\$35	\$35
Revenue (c x cmp)	\$420	\$840	\$1,400
TELUS Cost	\$300	\$300	\$300
Gross Margin	\$120	\$540	\$1,100

Note: These numbers are examples and are meant to reflect the Gross Margin (i.e., revenue minus variable expenses). There are many additional cost factors to explore, some of which are referred to in the rest of this document.

Provincial Uniform Pricing

The affordability pricing model is available for the first circuit in each community. The majority of communities will be able to provide Internet service to all their customers with one circuit. If an additional circuit is required to meet customer demand in a community, TELUS has developed a provincial uniform pricing model to provide rural communities with the same rates as those offered in the Lower Mainland.

Provincial Uniformed Pricing Three Year Contract Term	Monthly Price	One Time Fee
Carrier Internet Managed		
Ethernet (10 Mbps) HDX, Routed (10Mbps PVC)	\$1,550	\$3,500
Ethernet (10 Mbps) FDX, Routed (10Mbps PVC)	\$1,937	\$3,500
Fast Ethernet (100 Mbps) HDX, Routed (30 Mbps PVC)	\$3,328	\$3,500
Fast Ethernet (100 Mbps) FDX, Routed (30 Mbps PVC)	\$3,863	\$3,500
Internet, each Mbps	\$200	no charge
Carrier WAN		
Ethernet (10 Mbps) FDX Bridged (10 Mbps PVC)	\$1,140	\$2,000
Fast Ethernet (100 Mbps) FDX, Bridged (30 Mbps PVC)	\$1,568	\$2,000
Internet, each Mbps	\$200	no charge

Carrier Internet Managed	Throughput
Ethernet (10 Mbps) HDX, Routed (10 Mbps PVC)	6.8Mbps uni-direction
Ethernet (10 Mbps) FDX, Routed (10 Mbps PVC)	9Mbps each direction
Fast Ethernet (100 Mbps) HDX, Routed (30 Mbps PVC)	30Mbps uni-direction
Fast Ethernet (100 Mbps) FDX, Routed (30 Mbps PVC)	30Mbps each direction
Carrier WAN	
Ethernet (10 Mbps) FDX, Bridged (10 Mbps PVC)	9Mbps each direction
Fast Ethernet (100 Mbps) FDX, Bridged (30 Mbps PVC)	3Mbps each direction

What should I do now?

If you are interested in bringing broadband connectivity to your area, the rest of this handbook will guide you through the steps needed to get connected. However, the steps identified in this handbook are intended to provide an overview only and each applicant is responsible for undertaking due diligence and retaining professional assistance for their project as required.

Through the CCA, the 119 unserved communities are eligible to receive an inexpensive single termination point or gateway to the TELUS infrastructure. To access the planned TELUS infrastructure build schedule in the 119 communities, please check the interactive map on the Connecting Communities Web site.

Useful link: about.telus.com/digitaldivide/map.html.

From the single open access point in each community, a network has to be constructed to deliver last mile services to businesses and homes. There are several network options for communities to consider.

Scenario 1 – Community Champion

Community champions need to determine if they want to establish themselves as an ISP and deliver service, or deliver service in partnership with an ISP. If you choose to partner with an ISP, there are many things to consider and it is important to be familiar with some of the technology and terms. The First Nations Technology Council has developed an “ISP Checklist” to help with this process. For more information on this, visit www.fntc.info on the Internet.

Scenario 2 – Becoming an ISP

It takes considerable time and effort to develop a feasible business case to become established as an ISP. The following steps have been developed to assist you in developing a market assessment.

NOTE: Whether you are a community champion or an ISP, it is essential to have the support of the community before moving forward. This will help minimize potential issues as the project proceeds.

Step #1: Gathering Background Information

Previous Studies

Before beginning, it is recommended that you check whether any previous studies have been completed in your area related to broadband, Internet, telephone, cable systems or rebroadcast facilities. If so, the data previously collected may be useful. You can also learn from the challenges and risks that have been identified in earlier studies.

Typical organizations that may have completed studies of this type include Community Futures, Regional Science Councils, TV Societies, Band Councils, schools, community centres, and ISPs.

It’s also a good idea to ask the local First Nations band or Village Council and other regional bodies if they know of any consultants who may have conducted studies or engineering work in your area. It’s important to note, however, that the assumptions may be outdated and a full review of the data, pricing and technology should be completed to ensure the findings are still valid.

For example, in previous studies, the gateway pricing may have been too expensive to sustain a business model. Under the CCA, the gateway pricing has been made affordable.

What networks or infrastructure does your community currently have?

You may not have broadband in your community, but you may have other communications technology already in place that can make it easier and less expensive to install the last mile connection.

Cable TV

If there is an existing community cable TV system, it may be possible to use the cable to carry broadband Internet service to the end users. Additional equipment and network upgrades would be required, but these may be less

expensive than building an entirely new system. You need to determine the following:

- how many homes in the community are connected to the system;
- how old is the system;
- how well the system has been maintained; and,
- who is operating the cable system in your community and can do local installation and maintenance work.

Rebroadcast Facilities

Many small communities that do not have a cable system have built a radio or TV rebroadcast facility. This is typically one or more satellite dishes that pick up radio and TV signals, and an antenna tower that broadcasts the signal around the community. It may be possible for you to use the existing transmission site for a wireless Internet system. You will need to determine whether the transmission site is easy to access, what type of power is available, and who owns and operates the site.

Wireless Networks

It is helpful to know if there are any wireless Internet systems in the community. Some of the major buildings in the community may have been interconnected using a wireless network. You need to know the following:

- who installed and operates the network;
- what frequencies are being used;
- where the antennas are; and,
- how the antennas are aimed.

Step # 2: Determine the Potential Customer Base and Existing Internet Users / Connections

To develop a successful business case for a network, you must be able to determine your potential customer base or the number of people, institutions and businesses that would use the network.

Community residents and businesses are your target audience. Depending on the community, some of these will already have some form of Internet access. One of the first tasks is to determine who these people are, what their connection is and what costs are associated with their connection.

NOTE: Do not include government agencies such as ICBC, BC Hydro, Workers' Compensation Board, BC Lottery Corporation, the provincial health authorities or any government ministries, because services to these agencies are currently provisioned by TELUS under a related agreement.

Demographics

It is important to know the demographics of your community or communities. This information generally consists of population, number of dwellings, age breakdown, computer usage, Internet usage, and anything else you feel is relevant to a successful study. Understanding your community's demographics helps provide some estimates when determining the local customer base. For more information on statistics and B.C. communities, visit www.bcstats.gov.bc.ca on the Internet.

Business or Organization Users

To help determine the needs of local businesses not currently receiving high speed service, a quick telephone survey can be conducted to determine what their interest would be in subscribing to high speed Internet service. A written questionnaire can also be developed and distributed to local business people in the community.

Home Users

Your major market to consider is the residential community. Depending on the size of the community, you should conduct a survey to determine how many residents have access to the Internet today and/or have computers in their home. Secondly, you should identify any residents who would be interested in subscribing to high speed Internet, if it were available.

It can be helpful to quote a target price within the survey. For example, you could ask: "If you could obtain broadband service for \$40 per month plus an installation fee, would you subscribe?" Asking these types of questions is a good way to get a general feel for the potential level of initial uptake for the new service.

To ensure that your business plan is viable long-term, we recommend that you are conservative in your assumptions about the number of subscribers, financials, etc.

If it is not practical to survey homes in your community, you may be able to conduct a sample survey of users, or use estimates derived from national or regional statistics on broadband penetration in rural communities.

Various studies suggest that 30 to 70 percent of the homes in an area with broadband available will purchase the service. This is an assumption, and will vary by factors such as economic environment, computer use and Internet familiarity in the home. It is also useful to gauge the level of interest by finding out how many people in the community subscribe to low speed service such as dial-up modem connections to the Internet, and what the costs are for that service.

Remember that homes in surrounding rural areas and neighbouring communities may also be potential users depending on your last mile solution.

Once this valuable data has been collected, you should have an estimate of your customer base by home user and small business user. You can then use this information to structure your customer pricing models and three-year forecast.

Step #3: Getting Help

It is very important to accurately assess your ability to carry this project through to completion. Things to consider include your available time, resources and strengths. If there are already people in your community who have technical or business skills that can be drawn upon to plan and build the network, the task will be much easier. Gathering these resources at the early stages will help make the project a success.

In addition, there are various agencies that may be able to assist you, such as the First Nations Technology Council (FNTC) and the B.C. Community Connectivity Cooperative (BC3). For more information, visit the Web sites listed below.

Useful links: www.fntc.info
www.bc3.ca

Business Help

It will be helpful to have someone who can assist in developing the business case or to help write project plans and funding applications. Your community may have one or more people who have previously done cost studies and project proposals – perhaps for a sewer system or a community hall. These proposals could contain vital information that may be needed for a business plan. Someone with an understanding of the financial numbers and content for proposals is valuable even if this individual does not understand the technology involved. The business plan template contained in Appendix III is intended to guide this process.

There are also several online resources that can help with the business and financial aspects of the proposal.

Useful links: www.smallbusinessbc.ca
www.firstbusiness.ca

Technical Help

Many small communities have computer-savvy members with a lot of experience in using the Internet. Tapping into the resources available within your community will help with planning your proposal. It will also be useful to know whether some of these people might be able to help with building, operating, maintaining and administering the network. For example, if your village has its own water system, perhaps the front-end loader used by the water department could be used to dig the footings for a transmission tower. If the local Band office has a bookkeeper, perhaps he or she could help do the billing for Internet services.

Engineering Help

Depending on the complexity of your broadband project, an engineer or technical consultant may need to be involved. These people would normally be involved early in the project and perhaps help determine the best solution for last mile deployment in the area.

Partnerships

The search for resources to help in planning and implementing a network does not have to end in your community. Including outer lying areas or neighbouring communities in the plan may increase the sustainability of your business model.

Step #4: Determining Start-up and Operating Costs

Once an estimate of the potential customer base and a technology framework has been developed, it's time to estimate the start-up costs to build the network and the annual operating costs. These costs need to be balanced against anticipated revenue to determine if the business plan for the network is sustainable.

In order to determine the costs, it will be necessary to explore the options available in your community. The biggest cost in the deployment of the new network will be infrastructure. There is no single solution that fits all communities.

What broadband technologies make sense for my community?

The major challenge for a community network is local distribution of the Internet from the gateway to the community – or the last mile solution. A brief overview of the major technologies is provided below to help you determine what choices could be appropriate for your community. Once you have determined which technologies to study in further detail, there are many excellent in-depth guides available. One example is the Community Wireless Handbook, by Matthew Asham, (BC Wireless), which is available at:

www.bcwireless.net/~matthewa/handbook on the Internet.

Common Broadband Technologies:

Wireless Internet

One of the more common methods of delivering broadband to homes and business in rural communities is wireless. A wireless system uses high frequency radio signals to transmit and receive the Internet signal between the subscriber's computer and the central transmitter site at speeds in the 1 to 10 Mbps range.

To implement a wireless system you will need to build one (or more) central transmitter sites (known as access points), which will require some sort of tower with radio equipment and one or more antennas. The ideal access point location is at or near a high point in the community, is accessible by road, and will have hydro power available or nearby.

The cost of building an access point can range from \$5,000 to \$50,000 depending on the size of the tower required, the availability of volunteer labour and equipment, and the difficulty of constructing a tower at the site.

In addition, a small radio antenna box or Customer Premise Equipment (CPE) needs to be installed at each home or business. Ideally, the antenna at the subscriber location will have direct line-of-sight (no obstructions, trees or buildings in the way) to the antenna at the access point location. The cost of CPE is typically between \$200 and \$600 per subscriber depending on your deployment and equipment manufacturer.

Since the cost for the CPE will be an expense, you will have to determine whether your customers will pay a one time charge or if they would prefer monthly payments for either rental or purchase options.

Wireless may be a solution for smaller communities that cannot afford the higher up-front costs of Digital Subscriber Line (DSL) or cable systems.

Cable Distribution (CATV Distribution)

Many rural and remote communities have a non-operational cable system that is no longer in use. This system can be upgraded to use existing Cable TV (CATV) wiring in the community to distribute the Internet signal to the home. Modern cable modem systems can operate at speeds between 2 and 5 Mbps for both upload and download.

A cable Internet system requires a sizeable up-front investment at the central office. The Internet connection needs to be brought from the gateway in the community, and Cable Modem Termination System (CMTS) equipment needs to be installed to interface to the Internet connection (at an average cost of \$30,000 to \$50,000).

All existing amplifiers along the cable route need to be upgraded to units that can transfer signal in both directions rather than just from the central office to the home (approximately \$3,000 to \$5,000 per km. of cable), and a cable modem box is required in each subscriber's home (approximately \$70 to \$100).

Smaller communities may not have enough subscribers to justify these up-front costs. Costs will vary significantly with the age and design of the existing cable system, so it is recommended that a detailed engineering study be completed to determine the exact costs of the upgrades.

Fibre Optic

A single optical fibre line can carry an enormous amount of Internet traffic (more than 1,000 Mbps). Fibre has become the technology that telephone companies and Internet providers use to link their facilities with those of large business and institutional users. Fibre to the home (FTTH) or business (FTTB) will one day be common in larger cities, but with current technology it is not yet cost-effective for small rural areas.

Many small communities have fibre running nearby; however, there is usually no access to the fibre because of prohibitive termination costs at the community location.

What are the major cost elements of a broadband network?

Infrastructure Costs

In most cases, the capital and labour costs to install the network makes up the largest portion of the project's up-front costs. For example, if a wireless solution is chosen, the infrastructure costs could include items such as:

- the tower
- access point radios
- antennas
- cabling for a wireless system access point
- the labour to clear the site and dig a hole for a concrete pad for the tower
- the assembly and mounting of the tower
- installation of an equipment box to hold the electronics

- bringing in hydro power
- cabling all the equipment together, and
- testing and configuring the system.

Start-up costs also include:

- consulting and engineering costs
- the costs of any site surveys
- network plans and studies
- permit fees, and
- fees to formalize the organization that will install and operate the network.

Other Start-up costs

Subscriber Unit Costs

Each new subscriber will need equipment installed at their home or business (sometimes called Customer Premise Equipment or CPE). These costs can be substantial (\$200 to \$600), particularly in the case of a wireless network.

In order to recover your equipment costs, you can either charge a one-time fee or provide your customers with a monthly lease arrangement. You may want to ask your customer for a deposit to ensure that the equipment will be returned if the customer moves or stops subscribing.

Marketing Costs

Marketing your services is a critical step to ensure the success of your business. Communicating to your target market about your business, the services you are offering and your prices will support a stronger business case. Various marketing platforms can be used, including an informational Web site, community newsletters, or print and electronic advertising.

Administrative Costs

There are two options for setting up and running a community network. In the first option, you do the planning and implementation and arrange for a third party to operate, maintain and administer the network. The third party that you contract with to operate the network will ask for a portion of the revenue or perhaps some fixed fee per subscriber as compensation.

The second option is to set up the organization as a network operator and perform all the day-to-day operations and administration yourself. In this case you will need to budget for the costs of running the network. You may be able to use some volunteer or donated help but having dedicated individuals for key positions will make the business run more smoothly.

Commonly incurred costs include:

- office space
- insurance
- administrative staff: subscriptions, billing, accounting
- technical staff: tech support, system operations, maintenance
- vehicle costs and mileage
- spare parts and supplies, and
- organization overhead.

In addition to the administrative tasks, a decision must be made regarding operating your own servers and services. To provide clients with access to the network, one or more computers that are attached to the local network must be able to perform the following functions:

User Authentication - an authentication server must determine which users are trying to use the network and whether they should be allowed to do so.

Assign Addresses - assign a unique code to each user to allow network traffic to be delivered to that user (this code is called the Internet Protocol or IP address). This is managed by a server called the Dynamic Host Control Protocol (DHCP) server.

Look up Addresses - decode the destination addresses for Internet traffic by looking up the IP address for a specific site. This is called a Dynamic Name Server or DNS.

E-mail - send and receive e-mail for your users. This is called a Mail Server.

You may be able to subcontract these tasks to TELUS or other service providers for a fee rather than buying, setting up and maintaining the hardware and software yourself.

Other Costs

Bad Debt

It is important to allow for uncollectible customer accounts, also known as bad debt. Bad debt may represent 3 to 5 percent of your monthly revenue stream.

Billing System

It is not critical to implement an automatic billing system, but it will save valuable time and assure customers are properly charged for the services being provided.

Bandwidth Control

Depending on your customers and the size of the network, bandwidth shaping or control may become a concern. If certain services such as Voice-over Internet Protocol (VoIP) are being implemented, or if you have clients that need dedicated bandwidth, these systems can improve the efficiency and greatly increase the quality of service delivered.

Customer Churn

Another factor to consider is customers who discontinue their service. Known as customer churn, this can range from 1 to 5 percent of your monthly subscribers.

ISP Managed Services

A number of vendors will set up ISP services as an "Internet in a box" solution or provide a complete turnkey package so that you do not have to learn the intricacies of how to configure and maintain these services.

This may be an ideal way to start your business. As you gain experience, develop your customer base and begin to see positive cash flow, these services could be moved in-house. ISP managed services may include:

- the ability to create accounts online
- e-mail and web hosting
- customer billing and activation
- bandwidth shaping, and
- 24/7 support desks.

For more information and assistance, go to the British Columbia Community Co-operative Web site at www.bc3.ca.

Are there any funds available for the last mile?

Community Network Infrastructure Grant (CNIG)

There were some limited funds made available for last mile infrastructure, but this program has concluded. It is hopeful more funding can be made available in the future. There is also a possibility of a federal broadband program being developed in the future.

Useful links: www.network.gov.bc.ca
www.broadband.gc.ca

Now What?

Once you have defined your potential customer base and estimated start-up costs, it is time to begin to build the business plan.

It is essential to make the business plan as realistic as possible. In order to assist with this process an Excel spreadsheet containing a business plan template has been provided. If you plan to apply for eligibility as an ISP for an unserved community, please use the business plan template contained in Appendix III.

Summary

This handbook is intended to provide a better understanding of the processes involved in developing a broadband technology plan for your community. It isn't necessary to be an engineer or a computer expert to get the process started for your community. Help is available and more detailed information and support can be found on the many Web sites listed throughout this handbook.

We hope this handbook provides clear information that will help you take the first steps to getting your community on board with the exciting opportunities affordable broadband technology provides.

For more information, please visit: www.network.gov.bc.ca

Appendix I

Where can you go for help?

Community networks are becoming increasingly popular as small and rural communities look for ways to access broadband Internet services. Many other B.C. communities have gone through the same process that you are now going through and may have answers to some of the questions you are facing.

The following organizations have been involved in community network planning and in developing resources:

British Columbia Community Connectivity Co-operative (BC3) – www.bc3.ca

BC3's mission includes educating communities about broadband and how to plan for a community network. BC3 provides resources such as an informational Web site and referrals to help communities get the information they need. They host an annual conference for community networking organizations and provide a series of training workshops that are offered throughout the province.

NetWork BC – www.network.gov.bc.ca

NetWork BC is the provincial government's dedicated project team that deals with community networks. NetWork BC negotiated the Connecting Communities Agreement with TELUS to bring high speed access to 119 unserved communities in the province. NetWork BC keeps track of new network facilities being installed for school and government use and looks for opportunities to extend those networks for community use. They track and report on communities that do not have broadband, and encourage organizations and individuals in those communities to investigate community networks.

First Nations Technology Council (FNTC) – www.fntc.info

FNTC helps First Nations throughout B.C. with planning and implementing technology solutions in their respective communities. FNTC brings small communities together to share their successes and learn from their mistakes. FNTC provides resources that help communities understand the opportunities that technology can provide and how to access those technologies.

**First Nations Education Steering Committee (FNESC) and
First Nations Schools Association (FNSA) – www.fnesc.bc.ca**

Recognizing that broadband connectivity is a great aid to education in small and remote First Nations communities, FNESC and FNSA, through Industry Canada's First Nations SchoolNet have been helping schools in these communities get connected to the Internet, and access the wide range of material that is available to the online student. They have accumulated a wealth of experience in dealing with broadband access and can assist communities that are interested in implementing their own solutions.

BC Wireless Network Society – www.bcwireless.net

The BC Wireless Network Society assists organizations and individuals that want to build wireless community networks. The society provides advice, tools, education, and discussion forums for those interested in the implementation of wireless technology.

Community Networking Conferences

These conferences are held on an annual basis for people involved in community networks. They provide an opportunity to meet and talk with people from other communities that are going through the same processes. The conferences enable people from communities across B.C. to share stories and attend workshops and training sessions. Financial assistance to travel to these conferences may be available. Contact the FNTC or BC3 about the dates for upcoming conferences.

Appendix II – Glossary

Bandwidth: Bandwidth refers to how fast data flows through the path that it travels to your computer; it's usually measured in kilobits, megabits or gigabits per second.

Broadband: Broadband comes from the words "broad bandwidth" and is used to describe a high-capacity, two-way link between an end user and access network suppliers.

Cable modem: Refers to a type of broadband connection that brings information to homes and businesses over ordinary television cable lines.

Downstream speed: Refers to the speed at which data flows from the information server to your computer.

DSL: Stands for digital subscriber line; it refers to a type of broadband connection that brings information to homes and businesses over ordinary copper telephone lines.

Full-Duplex: Refers to the transmission of data in two directions simultaneously, for example a telephone is full-duplex because both parties can talk at once.

Gateway: A network connection that provides access to the Internet from your community. Sometimes called a Point-of-Presence or PoP.

Gigabit: One thousand million bits.

Half-duplex: Refers to the transmission of data in just one direction at a time. For example, a walkie-talkie is a half-duplex device because only one party can talk at a time.

ISP (Internet Service Provider): Users connect to the Internet through an ISP (Internet Service Provider). The ISP administers the network and provides services such as e-mail, spam filtering, etc.

Kbps: Stands for Kilobits per second, or thousands of bits per second. For example, most analog modems transmit at 56 Kbps or 28.8 Kbps.

LAN: Local Area Network. A data network intended to serve an area of only a few square kilometres or less.

Last Mile: The final leg in connecting homes, businesses and other institutions to a high speed wholesale connection.

Mbps: Stands for Megabits per second, or millions of bits per second. This is a measurement of how much data can be transmitted through a connection. For example, 6 Mbps is 200 times faster than a 28.8 Kbps analog modem.

Network: A computer network is a data communications system that interconnects computer systems at different sites. A network may be composed of any combination of LANs, or WANs.

PoP (Point of Presence): see Gateway

Satellite: Refers to a type of broadband connection where information is sent from and arrives at a computer through satellite dishes.

Upstream speed: Refers to the speed at which data flows from your computer to the information server.

WAN: Wide Area Network

Wireless: Refers to a type of broadband connection where information is sent between a computer through transmission towers by way of high frequency radio signals.

Co-Location: With permission of the telco or external delivery company – you have the ability to house your equipment in their facilities.

Appendix III – ISP Business Plan template for Local and Regional Internet Service Providers

The Government of B.C. and TELUS have developed a business plan template for interested Local and Regional Internet Service provider applicants to use when developing your business plan. You can access this template on the Connecting Communities website which is available at:

about.telus.com/digitaldivide/economic.html

Once you have completed this template, please save it and attach it to your ISP Application form available on line on the Connecting Communities website.

Note: Individuals asking for this handbook to be mailed to their location will receive a copy of the excel spreadsheet on a CD or disk.