

Nunavut Community Broadband Services

Section 1 – Cover Page Information

Title of the Project

Nunavut Community Broadband Services Project

Community Champion

Nunavut Broadband Development Corporation (NBDC)
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Project Leader

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Community Name

Nunavut Territory. For the purpose of the development of Broadband in Nunavut, the entire Nunavut Territory is viewed as a community. More specifically the Nunavut community consists of the people and organizations that reside in the 25 municipalities listed in Appendix A.

Signature

Director and Project Leader
Nunavut Broadband Development Corporation

David E. Smith

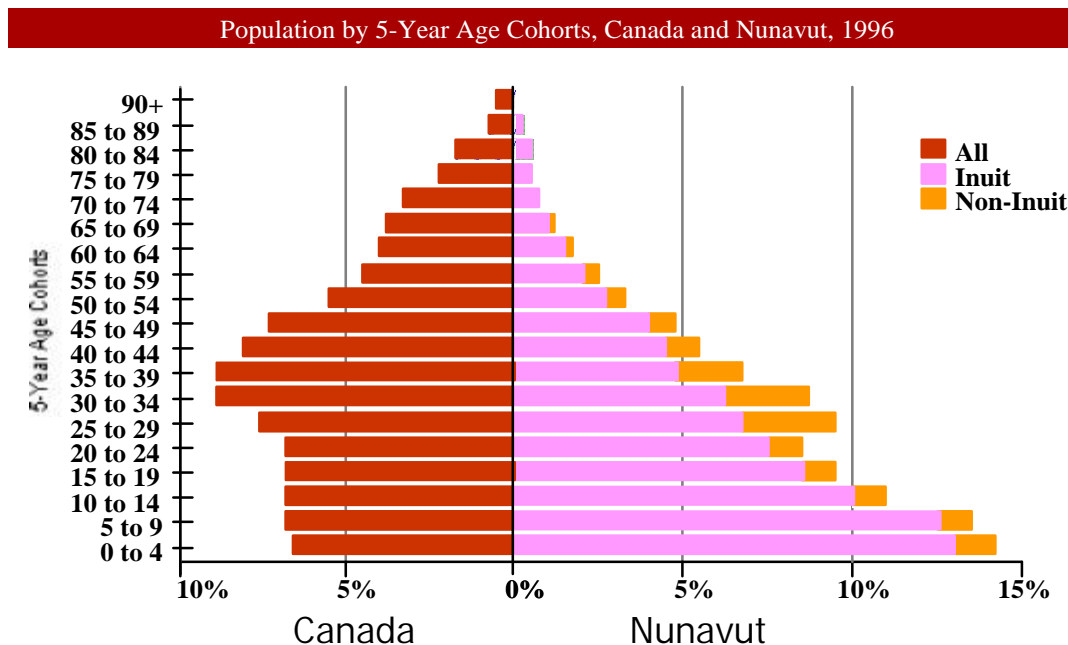
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Section 2

Identification of Community Champion and Communities

The entire Nunavut Territory is viewed as a community for the purpose of the development of Broadband in Nunavut. More specifically the Nunavut community consists of the people and organizations that permanently reside in the 25 municipalities listed in Appendix A. Excluded are locations that are operated by resource companies and defense, research and tourism locations occupied on a seasonal basis.

Nunavut's population is 85% Inuit. The population resides across three time zones in one of the harshest climates in the world. None of the 25 populated locations are accessible by road. Goods may be shipped by sea on a seasonal basis but for some locations, a season may pass without sea access due to ice conditions. The population of Nunavut is compared to Canada in the following chart. Note the difference between Canada and Nunavut as to age distribution.



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The following organizations or functions exist in every Nunavut location:

- An airport;
- A power plant;
- A tank farm for distribution of petroleum products;
- A municipal government including water and sewage services;
- One or more schools, a health centre (and in one case, a hospital);
- One or more retail stores selling food and consumer goods;
- Basic voice telephone services provided by Northwestel.

Some of the 25 locations also include Canada or Nunavut government offices, banks and Nunavut Arctic College facilities. All locations have various NGO and private sector interests to service the community, to support tourism, culture and craft products, wildlife and marine activities, resource development and arctic research projects.

Several of the above organizations and functions have private low-speed data communications services for administrative purposes funded by various government and private sector budgets. Most locations have no public communications services beyond basic voice telephone services.

The current communications infrastructure in Nunavut supports applications that were typical during the 1980's in southern Canada.

Other projects and budgets address the specific needs of health, core government functions such as payroll and the administrative needs of the schools and Nunavut Arctic College. Such functions are not the subject of this proposal.

Nunavut has been very successful in installing and managing computer and communications services for internal government purposes. In addition, recent projects have been completed or are underway to install computers supplied by the Gates Foundation in libraries and to provide Telehealth services in selected health centres.

This proposal specifically addresses the needs of Nunavut beyond basic administrative and health functions including the following activities, organizations and users:

- Municipal governments;
- Inuit and community organizations (NGOs);
- Inuit language and cultural activities;
- Access to remote education services;
- Artists and carvers for creative and distribution purposes;
- Private sector organizations;
- Citizens.

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Community

All 25 municipalities within Nunavut are included in this Nunavut proposal. These municipalities have the characteristics described in the previous section. None have road access.

The table in Appendix A contains the names and details of each municipality including the current total available bandwidth and the postal code as requested by the guidelines.

Community Champion

The Nunavut Broadband Development Corporation (NBDC) is a not-for-profit legal entity established under federal legislation. NBDC has the legal authority to enter into contracts with the federal government.

In 2001 the Minister of Sustainable Development, Government of Nunavut (GN) established the Nunavut Broadband Task Force to review issues related to broadband and to provide recommendations. The Task Force membership was drawn primarily from the private sector and Inuit and community organizations. The Task Force report was presented to the Cabinet of the GN in August 2002 including a recommendation to create a successor of the Task Force to pursue broadband in Nunavut. (For more details on the Task Force see Section 4 below.)

In October 2002 the Nunavut Broadband Development Corporation (NBDC) was created by private individuals as a successor to the Nunavut Broadband Task Force. The membership of the organization will represent community, NGO, private sector and citizen interests. The NBDC is independent of the Government of Nunavut. The overall purpose of the organization is to enable broadband services for use by Inuit and community organizations, NGOs, the private sector and citizens.

The specific purposes of NBDC may be summarized as follows:

- To encourage the implementation of the Nunavut Broadband Task Force recommendations directly and through the governments of Canada and Nunavut;
- To establish partnerships with governments, private sector organizations and NGOs for the purpose of the development and implementation of broadband services in Nunavut;
- To prepare and publish reports and metrics to regularly assess the gap between the communication services available in the south compared to the services and the related costs in Nunavut.

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The current Board of the NBDC consists of a number of volunteers who have an interest in broadband in Nunavut with funding supplied by in-kind contributions. On a temporary basis, the Project Leader for the proposed project is David E. Smith. Mr. Smith was engaged in 1997 by the Government of Canada to implement the initial computer and communications infrastructure for the GN, subsequently acted as the first CIO of the GN and has retained an active role in IT infrastructure and economic development issues in Nunavut since the Territory was created.

The Nunavut Broadband Task Force is expected to meet before the end of the calendar year to appoint the permanent Board of the NBDC. The permanent Board will have a broad representation across the Territory (as does the Nunavut Broadband Task Force).

Once appointed, the permanent Board of NBDC will name a permanent Project Leader for this project. The name of the candidate for Project Leader will be released after approval by the permanent Board. The expected appointee resides in Nunavut, has extensive experience in Nunavut in the private sector, in various communications, broadcasting and education assignments and has a demonstrated interest in volunteer organizations that involve broadband and related technologies.

Within the mandate and structure described above, the Nunavut Broadband Development Corporation is submitting this proposal for funds under the Pilot Program for Broadband for Rural and Northern Development. We believe that NBDC qualifies for this program for the following reasons:

- **We represent Canada's most northern and most remote communities;**
- **Our population has a higher percentage of aboriginal people than any other jurisdiction in Canada;**
- **Every location in Nunavut is without road access;**
- **Our current services are more than a decade behind southern Canada.**

Section 3

Capability

Nunavut citizens and organizations have a long history of successfully implementing technology and institutional services in a complex and harsh environment. Over the last 25 years, many services equivalent in scope to broadband have been installed in every Nunavut municipality including:

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- Implementation of CBC broadcasting services;
- Implementation of telephone services;
- Implementation of cable TV services;
- Implementation of IT applications for income support, petroleum distribution, management of airports, management of power, water and sewage systems.

In addition to the above projects, Nunavut recently implemented territory-wide computer and communication applications for use by health, education and other GN departments. This accomplishment included private contractors and public sector employees working together toward a firm deadline being the creation of Nunavut on April 1, 1999.

In the 3 years since the creation of the Territory, the current GN IT infrastructure has evolved to a state-of-the-art status delivered by technical and management staff resident in Nunavut using resources from both the private and the public sector.

Several of the contributors to NBDC have direct experience with the launch and/or the ongoing management of the GN IT infrastructure and will bring their recent experience to the launch of broadband in Nunavut. This local expertise ensures a well-managed, effective broadband project.

Section 4

Commitment

To ensure the broadest possible understanding of issues and support for broadband within Nunavut, the Nunavut Broadband Development Corporation (NBDC) will undertake the steps described below in preparation for the development of the Business Plan.

As a predecessor to NBDC, the Nunavut Broadband Task Force was appointed by the Minister of Sustainable Development, Government of Nunavut. The Task Force has published a significant report on the future of broadband in Nunavut including recommendations directed to the governments of Nunavut and Canada. This report is widely viewed as the blueprint for broadband in Nunavut for the next few years. See http://www.gov.nu.ca/Nunavut/English/departments/DSD/1broadband_eng.pdf for an English copy of **Sivumuuqpallianiq, Moving Forward: Strengthening Our Self-reliance in the Information Age**. The Task Force consists of members of the Nunavut community with a majority of members representing the private sector and NGOs such as the Nunavut Association of Municipalities.

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See page ii of the above report for the list of Task Force members.

In addition to input from the individual Task Force members and the organizations that those members represent, the role and recommendations of the Task Force and the planned activities of the NBDC will be reviewed with each municipal mayor and a number of issues and questions of local interest will be raised. Input gathered in this fashion will contribute to the Business Plan. As of the date of the submission of this proposal, more than one-half of the mayors have been contacted.

As outlined in the Pilot Program Guidelines, a technically and commercially neutral request for proposal (RFP) will be issued with the results incorporated in the Business Plan. To ensure that the relevant technical and marketing issues are discussed and understood, NBDC plans to release a draft of the RFP to vendors in December 2002 to allow comments before the official RFP is released.

Section 5

Community Need

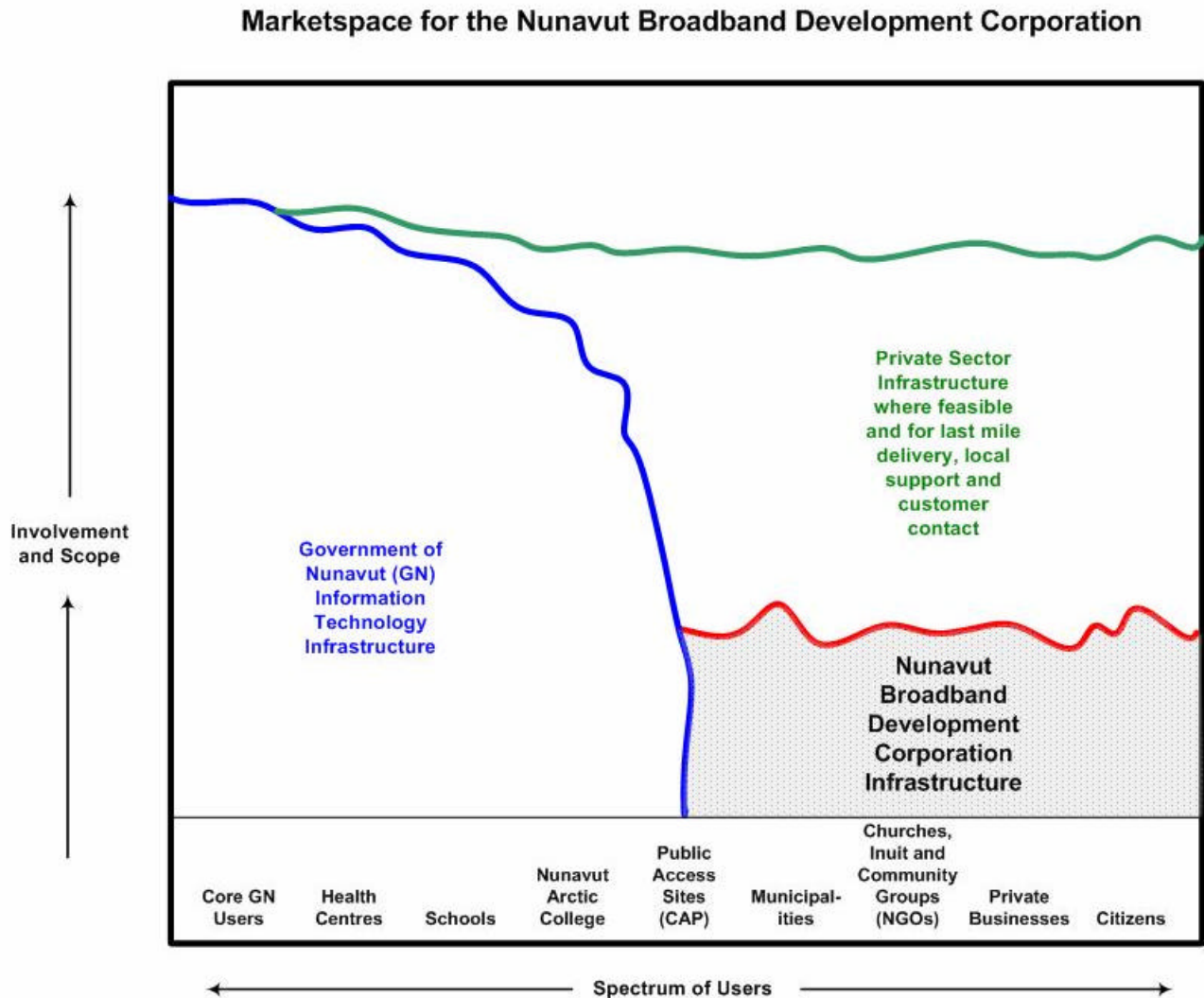
As Nunavut locations have no road access, all communications must be delivered using satellite services. Depending on the type and nature of the traffic, satellite access costs from 10 to 100 times the cost of services delivered by landline or microwave.

Within individual Nunavut locations, the communities are relatively dense and most buildings and homes are wired for telephone or cable TV and often both. Satellite dishes and equipment exist in all locations as a result of voice telephone services mandated by the CRTC. Competing satellite services are used in some locations. While the "last mile" is somewhat more expensive than in the south (due to climate and transportation costs), the insurmountable challenge in Nunavut to date has been funding the cost of satellite services.

For core government use including healthcare, limited funds and infrastructure are being made available to move toward broadband over time. In the larger communities such as Iqaluit, private sector ISPs deliver dialup Internet services to the private sector and citizens. But in most communities no data communication services are available locally except to government employees for government purposes. It is unlikely that this situation will change without subsidy for the cost of satellite service.

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The Nunavut Broadband Development Corporation (NBDC) will interact with other organizations in Nunavut as shown in the following diagram.



It should be noted that the NBDC is not intended to carry out functions that are now or in the future within the scope of the Government of Nunavut. Furthermore, the NBDC is not intended to be a competitor to the private sector within the Nunavut Territory. Rather, the NBDC is intended to provide infrastructure and support services in Nunavut that are not or can not be provided by the GN or the private sector.

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More specifically, the Nunavut Broadband Task Force recommendations that apply directly to the subject of this proposal can be summarized as follows:

- All Nunavut locations should be treated as part of the Nunavut community.
- Funding programs of the GN and Canada should recognize the high ongoing operating costs of satellite services.
- Every location should be ensured at least one Point of Presence for satellite services available to NGOs, the private sector and citizens at price levels similar to prices in the south.
- Nunavut-based technology options and vendors should be encouraged including at least one support vendor in every location.
- Public access sites and related services should be supported in every location in the Territory.
- Within the initiative to develop broadband, specific focus should be applied to the development of local content, as well as language and cultural issues.

Within the role for NBDC as outlined above, the proposed services are expected to benefit the following users and organizations:

Public Access Sites

A large percentage of the Nunavut population does not have access to a computer and may be unilingual in Inuktitut or speak English as a second language. In this situation public access sites, including training and mentoring using Inuktitut, is mandatory. As usage increases through these sites, some percentage of these public access users will acquire computers for use at home and/or will be employed in jobs that provide computer access.

Municipalities

Each Nunavut location has a municipal government to provide local services. Most municipalities have local standalone computers but have no capability of connecting to the Internet, communicating or sharing with other municipalities or interacting with the Government of Nunavut or other partners. This sector of users can immediately benefit from broadband providing improved social and economic conditions in communities.

NGOs, Private Sector and Citizens

In most communities this important segment of Nunavut has virtually no access to data communications. To date, Nunavut has been dominated by the public sector from an

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economic perspective. The non-government sector of the economy must have effective communication services to expand their role in the Nunavut economy. This expanded service must of course include basic toll-free Internet service, the opportunity to host web pages for local and world use and the ability to upload and download significant files including software, and digital content related to the Nunavut economy and culture.

E-Commerce Activity

Given the remote location of Nunavut communities, providing the ability to buy and sell goods and services using the Internet is urgent. Many small business operators may not be able to leave their community to assess and acquire supplies or to market their own goods and services. Citizens are restricted to purchasing goods at the local store without the Internet. More and more, even when connected to the Internet, the e-commerce activity is graphic intensive and cannot be carried out over low-speed circuits. For Nunavut to be part of the rest of Canada, broadband is essential.

Section 6

Current Facilities or Suppliers

For detailed information covering the current status of the 25 Nunavut communities, see Appendix A, Table 1. Table 2 in Appendix A contains information on the proposed deployment of the C-Band Public Benefits bandwidth which will be incremental to the status outlined in Table 1.

The Government of Nunavut utilizes the C-Band, satellite based, Digital Communications Network (DCN), operated by Ardicom. The DCN provides core government access in decentralized communities, and institutional access in all 25 communities. ISPs operate in several of the larger communities (see Appendix), purchasing services from Ardicom, or by setting up separate dishes, primarily using Ku-Band where technically possible.

In each of 25 communities, schools, Arctic College facilities, health centres, libraries and CAP sites (Institutions) share a 64 to 128 Kbps data circuit. This institutional access costs approximately \$160,000 per month for the 25 communities. For Internet access, an ISP in Yellowknife provides 1,024 Kbps Internet access shared among these institutions for \$57,000 per month. For the very limited capacity described above, the access charges exceed \$200,000 per month or about \$100 per citizen per year.

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The costs listed above do not include capital costs for a modem pool, or monthly charges for “last mile” phone lines. As NorthwesTel is the only phone company in Nunavut, ISPs providing local dial-up must pay the commercial rate for each modem line. For this reason, most local ISPs are moving towards providing community level wireless access.

The RCMP in each community has separate connectivity to the Ardicom network. Hamlets, organizations, businesses and private customers generally purchase services from local ISPs using local dial-up or wireless. ISP data and Internet costs are high, resulting in weak business cases and high monthly charges for customers. For example, one small ISP surveyed pays \$3,500/month for 128 Kbps data access, and an additional \$1,000/month for Internet access. This is for bandwidth less than a single DSL circuit. Typical local dial-up cannot exceed 28.8 or 33.6 Kbps due to technical constraints in the telephone service. Long distance ISP dial-up is generally limited to 9.6 or 12 Kbps.

For more details on each municipality see Appendix A.

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Section 7

Financial Details

The following details represent the budget for the Nunavut Broadband Development Corporation through the period of analysis and preparation of a Business Plan for submission to the Broadband for Rural and Northern Development Program. The costs outlined below do not include expenses incurred before submission of this proposal.

Project Costs	Amount (\$)	Notes
Management Costs	20,000	25 days at \$800 per day
Administrative Costs including printing	5,000	12.5 days at \$400 per day
Technical Analysis Costs	20,000	25 days at \$800 per day
RFP Process Costs	15,000	Including preparation and review
Legal and Accounting Fees	5,000	Expenses incurred after Oct 31
Travel and Lodging Costs	10,000	For community representatives
Total Costs	75,000	
Project Support		
Cash from Partners		
Indian and Northern Development	30,000	
GN – Sustainable Development	10,000	
In Kind (See Exhibit A)	5,000	
Total Support (excluding IC)	45,000	
Shortfall	30,000	
Total Industry Canada Support	30,000	
Total Support	75,000	

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Exhibit A – In Kind Project Support

In Kind Project Support	Amount (\$)	Notes
GN – Sustainable Development	5,000	Administrative Support for 12.5 days valued at \$400 per day including all necessary printing and e-mail services
Total In Kind Support	5,000	

Nunavut Community Broadband Services – Appendix A – Table 1

Nunavut Community Profiles

PS – Post Secondary (Nunavut Arctic College)
S(s) – K – 12 schools
Hsp – Hospital
HC – Health Centre

Lib – Community Public Library
CAP – Community Access Site
BW – Bandwidth
DCN – Digital Communications Network

NPC – Nunavut Power Corporation
Ham – Hamlet
Other – Organizations, business, residential
ISP – Internet Service Provider

DU – local dial-up Internet Access
WireL – local wireless Internet Access

Community	Pop '01	Postal Code	PS	S(s)	Institution				Provider BW DCN * (Kbps)	RCMP DCN* (Kbps)	Other major customers			Provider, inbound and "Last Mile"			
					Hsp	HC	Lib	CAP			NPC **	Ham ***	Other ***	ISP/ Wholesaler	BW **** (Kbps)	DU (\$)	WireL (\$)
Arctic Bay	646	X0A 0A0	X	X	-	X	X	X	64	-	-	X	Polar Land /Arctic Data Systems	128	90/m	-	
Arviat	1899	X0C 0E0	X	X	-	X	X	X	256	64	X	-	-	-	-	-	
Baker Lake	1507	X0C 0A0	X	X	-	X	X	X	128	64	X	X	Hamlet Network	128	-	60/m	
Cambridge Bay	1309	X0E 0C0	X	X	-	X	X	X	512	64	X	X	PolarNet /SSI Micro	384/5	125/m	495/m	
Cape Dorset	1148	X0A 0C0	X	X	-	X	-	X	64	64	-	-	-	-	-	-	
Chesterfield Inlet	345	X0C 0B0	X	X	-	X	-	-	64	64	-	-	-	-	-	-	
Clyde River	785	X0A 0E0	X	X	-	X	X	X	64	64	-	-	-	-	-	-	
Coral Harbour	712	X0C 0C0	X	X	-	X	-	X	64	64	-	-	Sympatico	64	-	-	
Gjoa Haven	960	X0E 1J0	X	X	-	X	-	-	64	64	-	X	PolarNet/SSI Micro	384/5	125/m	-	
Grise Fiord	163	X0A 0J0	X	X	-	X	-	-	64	64	-	-	-	-	-	-	
Hall Beach	609	X0A 0K0	X	X	-	X	-	-	64	64	-	-	-	-	-	-	
Igloolik	65012 860	X0A 0L0	X	X	-	X	X	-	64	64	-	-	-	-	-	-	
Iqaluit	5236	X0A 0H0, X0A 1H0	X	X	X	X	X	X	1536	64	X	X	X	Nunanet,	512	90/ 50hrs	495/ 1Gb
Kimmiut	433	X0A 0N0	X	X	-	X	-	X	64	64	-	-	-	-	-	-	
Kugaaruk	605	X0E 1K0	X	X	-	X	-	-	64	64	-	X	X	PolarNet /SSI Micro	384/5	125/m	-
Kugluktuk	1212	X0E 0E0	X	X	-	X	X	X	128	64	X	X	X	PolarNet /SSI Micro	384/5	125/m	495/m
Pangnirtung	1276	X0A 0R0	X	X	-	X	X	-	128	64	X	-	-	-	-	-	
Pond Inlet	1220	X0A 0S0	X	X	-	X	X	-	64	64	-	-	-	Illiniit Networks	128	80/m	80/m
Qikiqtarjuaq	519	X0A 0B0	X	X	-	X	-	-	64	64	-	-	-	-	-	-	
Rankin Inlet	2177	X0C 0G0	X	X	-	X	X	X	512	64	X	X	X	Arctic Technologies/ SSI Micro	384	55/m	1/Mb
Repulse Bay	612	X0C 0H0	X	X	-	X	-	X	64	64	-	-	-	-	-	-	
Resolute Bay	215	X0A 0V0	X	X	-	X	-	-	64	64	-	-	-	South Camp Inn	128/2	40/m	-
Sanikiluaq	684	X0A 0W0	X	X	-	X	-	X	64	64	-	-	-	Sanny Internet Service/ Arctic Data systems	64	4/hr	-
Taloyoak	720	X0E 1B0	X	X	-	X	-	X	64	64	-	X	X	PolarNet /SSI Micro	384/5	125/m	495/m
Whale Cove	305	X0C 0J0	X	X	-	X	-	-	64	64	-	-	-	-	-	-	

Notes:

1. BW on Institutional network is pre-Public Benefits. See Table 2 for Public Benefits increments.
2. Ardicom and alternate providers rely on satellite – no inter-community terrestrial connectivity exists in Nunavut.
3. Ardicom Institutional and RCMP networks receive "Last Mile" connectivity via DSL or T1 lines.
4. NorthWesTel is telephone provider to all 25 communities.
5. Local dial-up general ranges: 28.8 to 33.6 Kbps. Long distance dial-up is typically 9.6Kbps.

Service Provider

*	Local Retailer	Ardicom DCN
**	Wholesaler	SSI Micro
***		Arctic Data, RamTel, SSI Micro
****	Some ISPs purchase bulk bandwidth and share amongst several communities. For example, PolarNet shares 384Kbps between 5 communities.	

Nunavut Community Broadband Services – Appendix A – Table 2

Nunavut C-Band, Public Benefits Allocation				
Total allocation of 15MHz - roughly equivalent to 15Mbps. Communities in bold have GN offices.		PROPOSED INCREMENTAL CHANGE / ADDITION		
	CURRENT Tx + Rx (Kbps)	Tx (Kbps)	Rx (Kbps)	TOTAL (Kbps)
Arctic Bay	64	64	64	128
Arviat	256	384	384	768
Baker Lake	128	384	384	768
Cambridge Bay	64	384	384	768
Cape Dorset	64	384	384	768
Chesterfield Inlet	64	64	64	128
Clyde River	64	192	192	384
Coral Harbour	64	64	64	128
Gjoa Haven	64	128	128	256
Grise Fiord	64	64	64	128
Hall Beach	64	64	64	128
Igloolik	128	384	384	768
Iqaluit	1536	512	512	1024
Kimmirut	64	64	64	128
Kugaaruk	64	64	64	128
Kugluktuk	128	384	384	768
Pangnirtung	128	384	384	768
Pond Inlet	64	384	384	768
Qikiqtarjuaq	64	64	64	128
Rankin Inlet	512	384	384	768
Repulse Bay	64	64	64	128
Resolute Bay	64	128	128	256
Sanikiluaq	64	64	64	128
Taloyoak	64	128	128	256
Whale Cove	64	64	64	128
Total managed by Ardicom	3968	5248	5248	10496
Community Demonstration Projects		1500	1500	3000
CA*Net4 in Iqaluit		750	750	1500
TOTAL Public Benefits		7498	7498	14996