Fort Severn First Nation

Essential Telecommunication Services

"Building a Healthy and Smart Community Using Information Communication Technologies"

A Partner in the Kuh-ke-nah Network of Smart First Nations Demonstration Project

http://knet.ca/conferences/FtSevernICT.ppt

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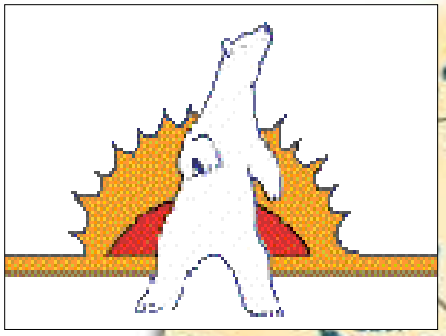
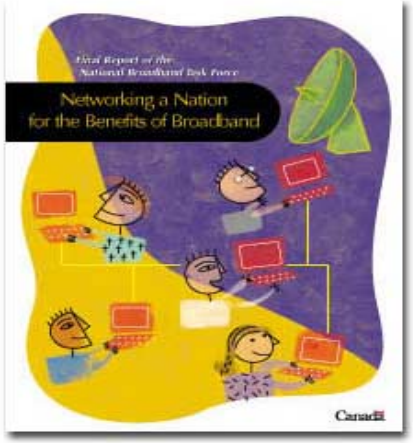
April, 2002



Located on the shore of the Severn River, Fort Severn First Nation is one of Ontario's oldest communities

THE PEOPLE AND THE LAND



National Broadband Task Force

The New National Dream:

Networking the Nation for Broadband Access

http://broadband.gc.ca

Fourth Principle: Equitable and Affordable Access to Broadband

All communities, institutions, businesses and individuals in Canada should have equitable and affordable access to broadband services and to the widest possible range of content and service providers. (page 9)

Fort Severn First Nation (Page 67)

Ontario's northern-most community is the Fort Severn First Nation, located on the shores of the Hudson Bay, near the Manitoba border. Its rich history and unique environment is maintained and protected by the Cree people who have always lived in this special part of Canada. Broadband telecommunication services are an important part of this community's economic development strategy. Partnering with Telesat Canada, the Communication Research Centre and Industry Canada - FedNor supported the installation of a satellite digital connection into Sioux Lookout that is now providing data and video connections to various service organizations. Fort Severn community members and organizations are using these communication tools to market and promote their traditional lands and local resources.

Fort Severn First Nation also participated with the other four Keewaytinook Okimakanak First Nations to submit an application to Industry Canada's SMART Community Demonstration Program in the summer of 1999. In May 2000, the Kuh-ke-nah SMART First Nations Demonstration project was selected as Canada's Aboriginal SMART demonstration project. As a partner in this project , Fort Severn community members are developing a number of broadband applications that will support both individuals and the community in the future.

Visit Fort Severn First Nation online at http://communities.knet.on.ca/fortsevern

Fort Severn First Nation

Distance - an Economic Barrier

Ft Severn is accessible by air year round and by winter road for 2 or 3 weeks in February

- return flight from Sioux Lookout costs $1065
- emergency air ambulance flight costs government $6,000 per flight
- air freight for materials & supplies is $1.87/lb from Sioux Lookout
- freight via barge (arrives once a year in the fall) is approx. $.50/lb

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Development of Internet Services

- 1994 long distance to K-Net BBS at 300bps (unreliable)
- 1997 long distance Internet at 14.4kbps (unreliable)
- 1998 school MSAT and DirecPC Internet, 4.8kbps up, shared 400kbps down (First Nations SchoolNet)
- 1999 wireless network - band office, police station, nursing station, school, etc & added another MSAT unit (FedNor)
- 2000 128kbps Internet and 512kbps on-demand video shared on community network via C-Band earth station with down link at K-Net in Sioux Lookout (FedNor)
- Summer 2001 upgrade existing plant to support cable modem service to every door, 20 residences served (Smart)
- early 2002 upgrade to medical quality video/MPLS & X-ray

(see also http://knet.ca/Madeline-story.htm for Madeline Stoney's intro to the Internet)

ALL ORGANIZATIONS and SERVICES ARE NETWORKED

Keewaytinook Internet High School

KiHS, Band Office & Nursing Station (1999 wireless network)

Elementary School & Computer Lab

Summer CAP Site (Aug 2000)

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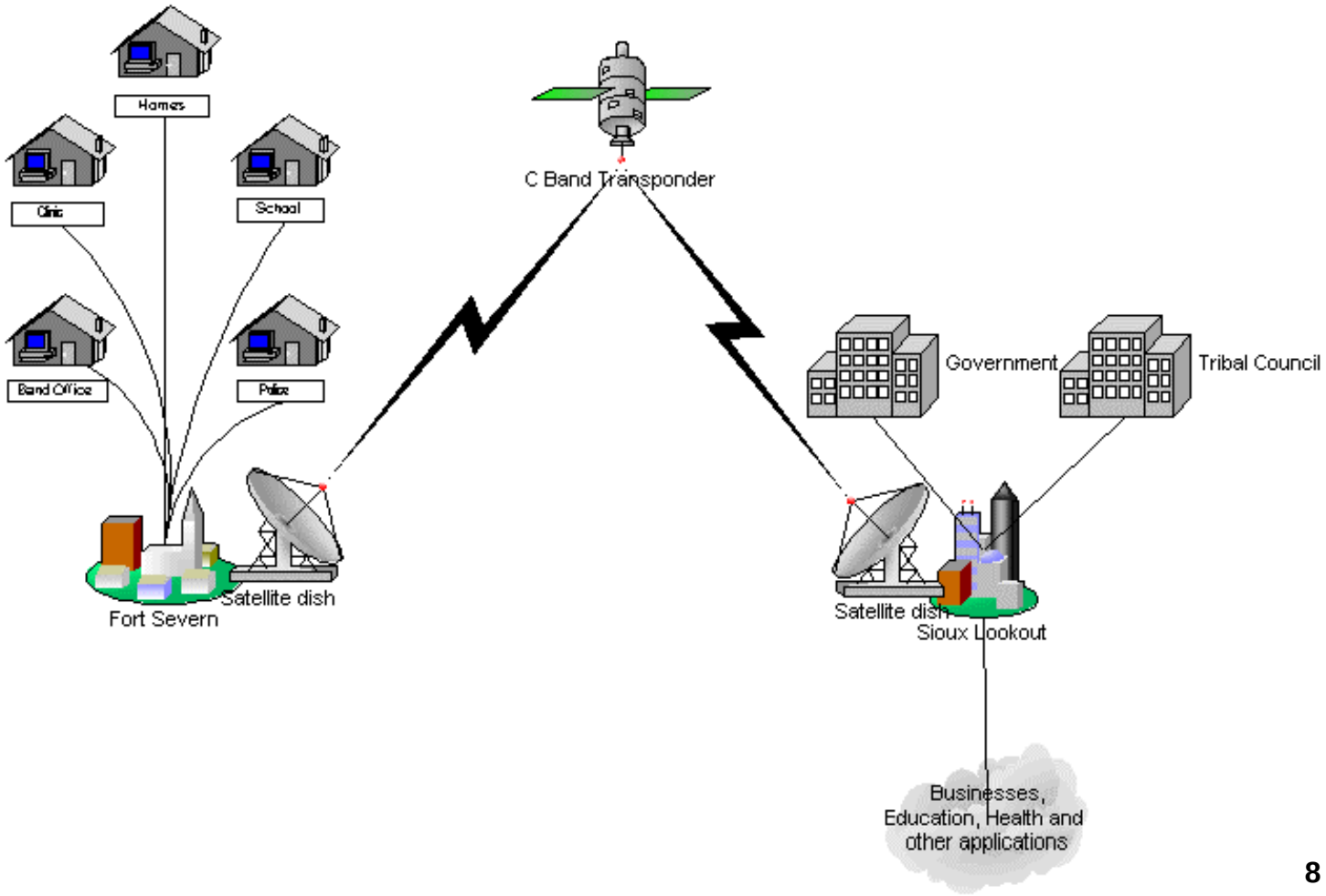
Connecting Every Building to the Cable Plant for Data and Video Services

The Local Economic Development Corporation owns the cable/data business



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Connecting to doctor at the Zone Hospital in Sioux Lookout using dedicated 128kbps data and 512 kbps on-demand C band satellite

Fort Severn dishes for TV and C band data services

The cable plant for television and data service

VSAT Dish in Sioux Lookout serves 3 sites

Making the Connections Work

http://knet.ca/fortstory/story1.html

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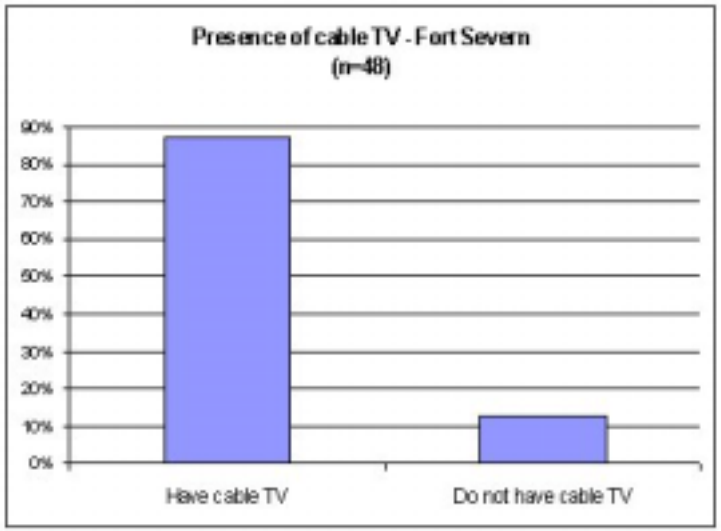
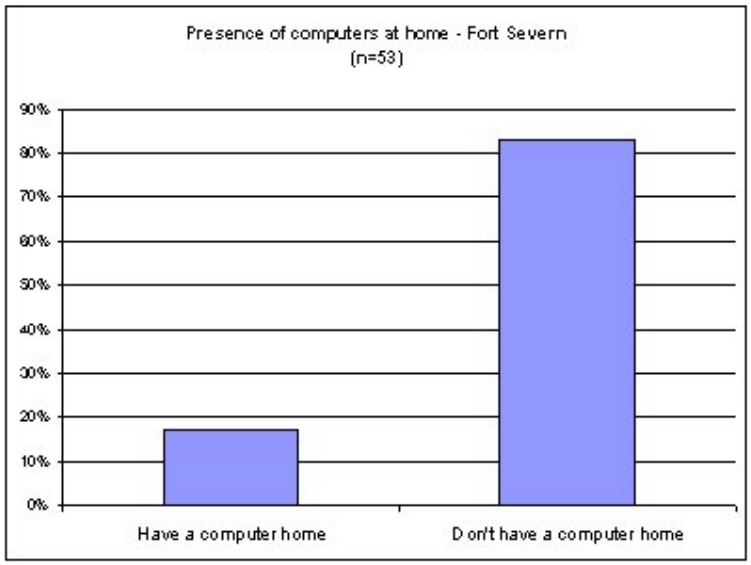
Residential Internet Market

(Ft Severn Household Surveys - August 2000)

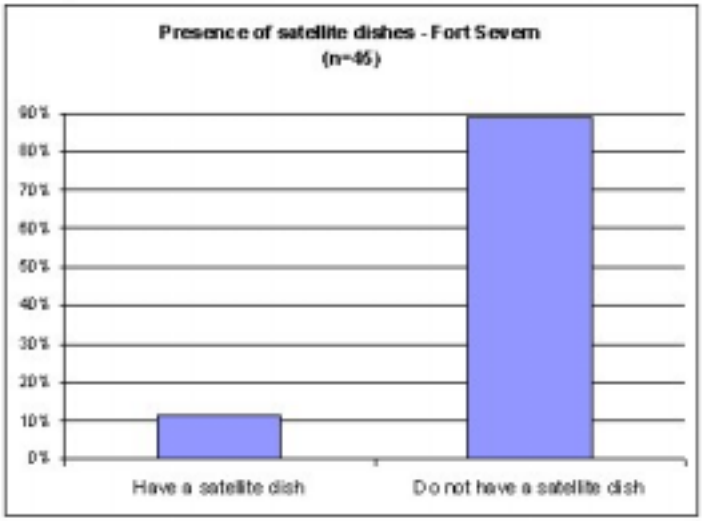
Do you have a TV Cable connection at home?



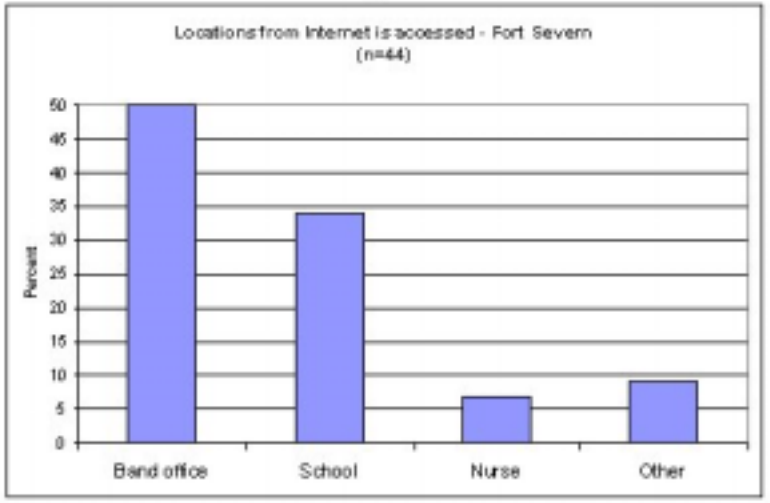
Do you have a computer at home?



Do you have a satellite dish for TV channels at home?



From where do they connect to the Internet?



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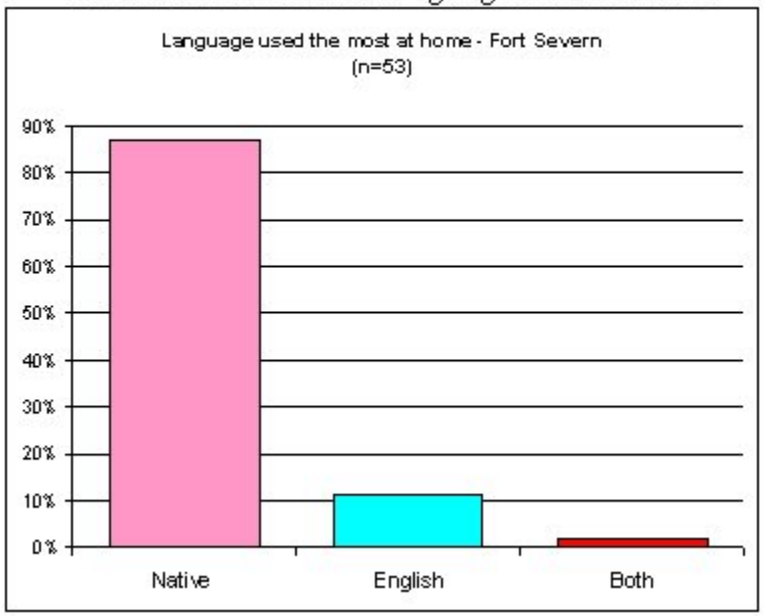
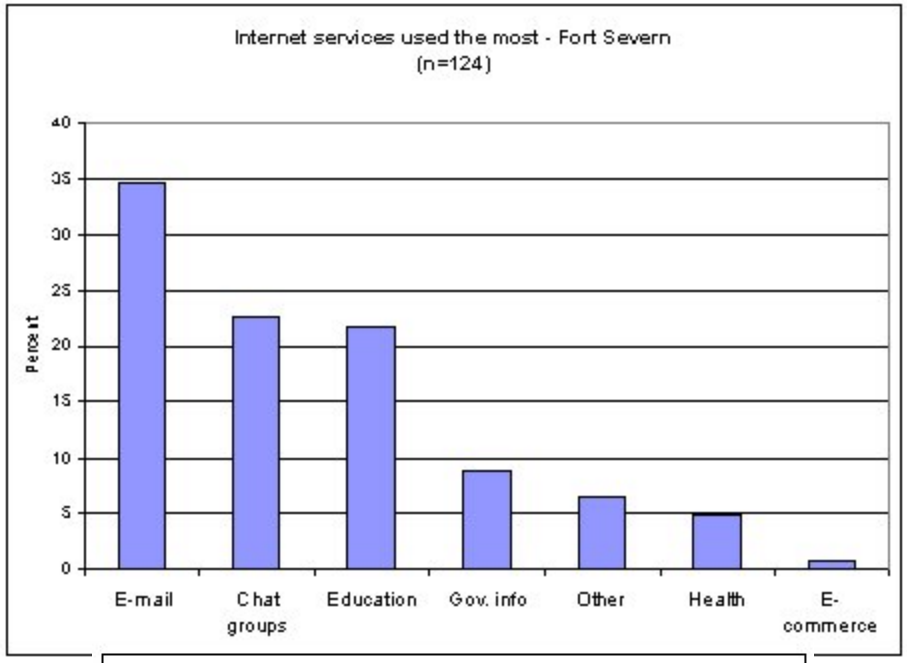
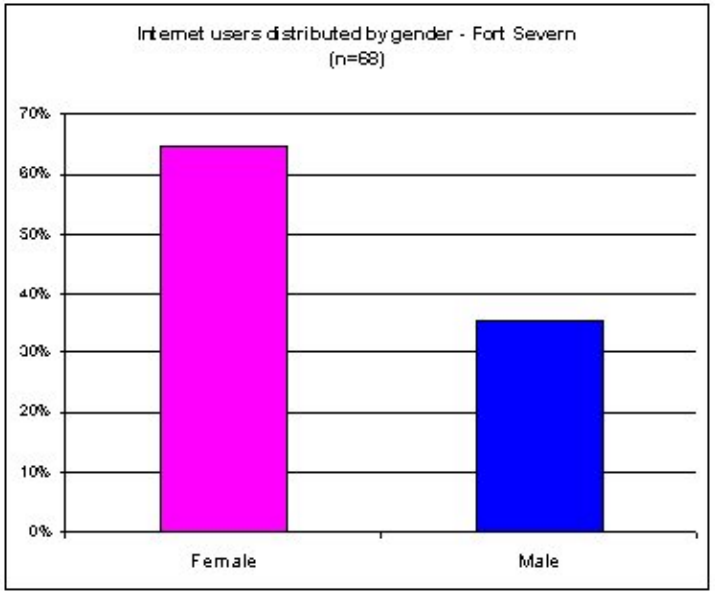
Residential Internet Market

Fort Severn Household Surveys - August 2000

What is the most used language in this house?







20 of 53 homes were connected by cable modem at $40/month in the first two months of operation this fall - as many homes reported owning a computer in the 2000 survey!

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Design Considerations / Opportunities …

- quality IP videoconferencing in addition to Internet a **MUST** for Ft Severn health, education, government, justice and business
- aggregate demand all homes & institutions for business case
- affordable video & Intranet dictates design to grow to aggregate demand in shared network of up to 12 remote First Nations drawing key services from Sioux Lookout & Thunder Bay
- seamless connection to Kuh-ke-nah (K-Net) terrestrial network
- scalable, technology with a future

Fort Severn First Nation

The Search...

- 18 Month Process:
  - Considered paying 100% of upgrade to existing Bell/ Telesat dish that provided voice service. Operating costs too high - backhaul charges from Bell downlink in Montreal to Sioux Lookout hospital and other services
  - two other providers could not support effective IP video
  - absence of a commercial solution in 1999 allowed Telesat and CRC to use R&D resources to design a state of the art scalable C band pipe to Fort Severn with a downlink in Sioux Lookout to the terrestrial network
  - business case improves as bandwidth/operating costs are shared by up to 11 area remote First Nations with no option for terrestrial service
  - FedNor contributes $442,700 to deployment

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Technical

- 3.8m C Band VSAT dish in each location
- 4MB up per modem and scalable
- robust Cisco 7200 series router supports MPLS
- cable modem network operated by the Band cable company
- VSAT downlink in Sioux Lookout connects to the Kuh-ke-nah Network Smart Demonstration project & network partners including Zone & SXL Hospitals & two tribal council offices
- supports medical quality IP video conferencing, IP telephone, Internet & Intranet
- gateway and bridge in Sioux Lookout link IP video to ISDN and switched 56 based videoconferencing
- over 6 months successful operation
- Telesat chose this C band model for Smart Labrador & AFN

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Key Partnerships

- other First Nations (Slate Falls and Anahiem Lake are presently sharing the same transponder space) - other satellite First Nations are approaching funders to address one time capital costs so they too can join the network
- Telesat Canada supplies C-band service at R&D prices & expertise
- CRC provides installation/expertise
- Education Network of Ontario provides bulk Internet and the K-Net Toronto point-of-presence (scalable to include other major centres across Canada)
- Health Canada/Zone Hospital/NORTH Network will deploy telemedicine services

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Actual Capital Costs

$80,000	dish and equipment (indoor and outdoor units, router) Telesat R&D price, CRC sets up electronics at no charge
$20,000	fencing, foundation, mounting, network technicians, airfare

Community Network Costs

$120,000	Upgrade cable to every door - 60 sites, (Smart project) $170,000 estimate for new 2 way cable installation
$25,000	plus $5,000/institution (5) for managed switch
$ 5,000	plus $250/cable modem(20) - small business or residence
$280,000	Ft Severn C Band installation & cable upgrade

NOTE: customer LAN, server, videoconference equipment not included

Fort Severn First Nation

Operating - Current Monthly Bandwidth

$2,000	128kbps up (shared 384kbps on return with 3 sites - Fort Severn, Slate Falls and Anahiem Lake)
$ 300	Internet (shared - $2,000 per meg of Internet)
$2,400	512 kbps video on-demand - est 1 hr/day @ $120/hr
$4,700	monthly bandwidth cost
	Revenue Sources
$450	IC/SchoolNet - school and & 4 CAP locations
$450	Keewaytinook Internet High School
$600	20 homes since fall 2001 (@$30 per unit per month)
$1,500	monthly revenue

NOTES:

- $3,200/month shortfall
- 128kbps is very limited Internet
- Band pays Ft Severn technician, network overhead not shown ($2,000/mo)
- SXL network overhead, video bridge, technical support not included above

Operating - 2002 projected with Feb prices

$8,000	512kbps up (only 64kbps Internet while video on)
$ 600	Internet (shared - $2,000 per meg of Internet)
$ 0	medical quality IP video in bandwidth above
$8,600	monthly bandwidth cost

Potential Sources of Revenue

$ 450	IC/SchoolNet - school and & 4 CAP locations
$ 450	Keewaytinook Internet High School
$ 900	grow to 30 homes (@$30 per unit per month)
$4,000	est CHIPP telemedicine project (approved for 18 months)
$ 300	Wahsa Adult Education (early 2002)
$ 500	Police, Hotel, Northern Store, Bearskin Airlines, etc
$6,600	

NOTES:

- $2,000/month shortfall
- only $2,600 revenue per month above is ongoing
- Smart Communities contribution will close the gap in 2002
- can't afford adequate Internet feed at $2,200/128kbps

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C Band Broadband - Lessons Learned

Satellite delivered broadband supporting Internet plus modern videoconference based telehealth, distance education, etc is viable in Ft Severn even at reduced Telesat R&D bandwidth rates only with government intervention

- industry would not contribute to infrastructure - no business case
- aggregation of demand is critical but needs to offset $2,000/128kbps cost
- customer ICT budget often not in place when service begins - Health Canada, INAC, Solicitor General - no ICT budget available to their agents in Ft Severn at the start of this development work
- capital and bulk of operating funds are project based - for 2002 only $2,600 ongoing revenue vs $8,600 bandwidth cost plus some $4,000 operating/month
- NBTF concluded that the typical small community removed from terrestrial service will require an ongoing subsidy of satellite costs

Fort Severn First Nation

C Band Broadband - Lessons Learned

Cost & effectiveness of quality videoconference based & other ICT applications, improves where shared among communities on network, with downlink/hubs located to minimize backhaul, shared gateways etc to reduce network overhead

- Significant efficiencies for both community and health, education, etc agencies were gained by investing in a VSAT downlink in Sioux Lookout - site of most services to Ft Severn, Slate Falls and 20 other remote First Nations (10 are broadband satellite candidates)
- integrated with terrestrial network which provides Internet and IP Video to hospitals, agencies and 4 First Nations (10 by Mar 2002) in the trading area
- long distance fees from video bridge to world - no fee within network
- network managed remotely by technicians in Sioux Lookout
- bulk Internet & capital purchasing, free engineering by vendors (ie Cisco)

Fort Severn First Nation

C Band Broadband - Lessons Learned

Technology must be robust, scalable, adaptable into the future, standards based (IP) and be selected / designed to support sophisticated applications cost effectively - IP videoconference is a good test!

- C Band technology has delivered as expected over 6 months
- scalable to meet the growing needs of the whole community
- some ability to manage data & video use of satellite channel
- Telesat assessing emerging TDMA which would allow cost effective management of bandwidth shared in networks such as growing KNet - multiple satellite served sites using data & video
- Internet Protocol data, voice, & video (H.323) applications are effective & video is interoperable with dial up systems via K-Net bridge

Fort Severn First Nation

Next Steps & Aspirations

- Secure revenues projected plus $2,000 more each month to increase community Internet feed from 128kbps to at least 256kbps
- continue to share lessons learned and develop operational partnerships with IC, Telesat, CRC, Smart Labrador
- acquire T1 space on IC transponder at remote terrestrial rate ~$2,600 which makes the business case to meet community broadband needs
- deploy telemedicine applications (CHIPP/FedNor)
- continuous improvement - in technology, pricing, partnerships
- build awareness & commitment of Health Canada and others to budget for ICT applications to serve remote First Nations and support the aggregator model where First Nation network prices are competitive
- build consensus, business plan for broadband infrastructure and applications to 9 other remote First Nations (and others as infrastructure becomes available