

Administration Office
Fort Severn First Nation
Fort Severn, Ontario
P0V 1W0

Ph: 1-807-478-1114
Fx: 1-807-478-1103



K-Net Services Office
P.O. Box 1439
115 King Street
Sioux Lookout, Ontario
P8T 1B9

Ph: 1-807-737-1135
Fx: 1-807-737-1720

From Potential to Practice:

Telecommunications & Development in the Nishnawbe-Aski Nation

A Report on K-Net activities to improve regional telecommunications infrastructure and diffuse information & communication technologies and capacities between October 1998 and October 2000
(available on-line at <http://knet.on.ca/NW-report.htm>)

Prepared by: K-Net Services
Prepared for: Industry Canada / FedNor

March 31, 2001

Deer Lake
McDowell Lake

Fort Severn
North Spirit Lake

Keewaywin
Poplar Hill

Contents

PART ONE: The NAN-Wide Telecommunications Development Project

Preface	i
Community-based Development	i
Gathering Strength	ii
A NAN-Wide Telecom Project	iii
Innovation By Tradition	iv
Next Steps	v
Executive Summary	1
Charting A Course	1
Results-based Development	2
Affordable Network Access	2
Growth in Digital Service to NAN Communities	3
Local Area and Municipal Area Networking	3
Network Design and Strategy Development	3
Capacity Building	3
Community Access to the Internet	3
Helpdesk Services	4
K-Net e-Mail Account Penetration	4
Website Utilization	4
Building Knowledge With Results	5
Making ICT Happen	5
Next Steps	6
A. Information Sharing	8
NAN-Wide Learning Communities	8
1. Coordinating Communications	9
External Networking	10
Presentations/Conferences	10
Regional and National Bodies	11
2. Advocacy	13
Basic Services	13
Advanced Services	14
3. Affordability	15
Negotiating Price	15
B. Telecommunications Infrastructure	18
Backbones	18
Satellite Distribution	18
Upgrading the Telecommunications Infrastructure	20
Unserved and Underserved Communities	20
Regional Terrestrial Telecommunications Infrastructure	22
Partnership Investment	23

Regional Satellite-based Telecommunications Infrastructure	27
Selecting a Vendor	28
Implementing a Solution	29
Proof-of-Concept	29
C. Networks Development	31
Network Incubation	31
Collaboration	33
Net Results	34
Interconnectivity	34
K-Net's Networking Vision	35
K-Net's Broadband Incubation Strategy	36
Implementing Broadband Networking	36
Getting Started	37
Basic Requirements	38
Lessons Learned	40
Telecommunication Activities Related to the K-Net Broadband Initiative	40
Network Progress and Capacity in NAN	41
D. ICT Training Methods and Strategies	53
Formal Learning	53
Delivery	54
Computer Administrator and Webmaster (1998)	55
Telecommunications Support Technician (1999)	56
Telecommunications Facilities Coordinator (2000)	56
Other formal training initiatives	57
On-line Orientation	58
Credit Course Delivery	58
Network Training	58
Youth Programming	59
Regional Coordinators	60
Informal Learning and ICT Animation	62
Animation and Informal Learning	62
On-line ICT Applications	63
On-line ICT Tools	65
E. The NAN-Wide Database Project	66
Data Collection	66
Database Software	66
Design Considerations	67
Data Access	67
Security	67
Data Entry	68
Prototype Development	68
Next Steps and Opportunities	68

F. Project Models (Case Studies)	71
1. Nishnawbe-Aski Development Fund Networking Project	71
Planning a Network Solution	71
Benefits and Opportunities	72
External	73
Internal	73
NADF/K-Net Partnership	74
Results	74
2. K-Net Frame Relay Project	76
Project Initiation	76
Building Wide Area Broadband Network Capacity	77
Pricing	80
SMART Leverage	80
Shared Value	80
3. Lac Seul Wireless Project	82
Stage One	82
Stage Two	84
G. Applications, Sustainability and Partnerships	89
Sustainable Applications	89
Baseline Applications	90
E-Mail	90
Web Access	90
Advanced Applications	90
1. Education	91
Keewaytinook Internet High School (KiHS)	91
Learning Process	92
Project Implementation	93
2. Health	93
Telepsychiatry Pilot (Independent Telehealth Application)	94
Project Aims	94
Process	95
Introducing the Service	95
Formative Results	95
NORTH Network (Aggregated Telehealth Application)	96
Project Activities	96
Delivery Framework	97
Migration to other First Nations	97
3. Justice and Policing	99
Introducing Videoconference Technology	99
Extension of Services	99
4. Kuh-ke-nah Portal	100
Aggregating Access	100
Partnerships	100

Lead Time	101
Broadband Application Development Opportunities	106
H. Recommendations	118
References	128

PART TWO: The Kuh-ke-nah National Aboriginal ICT Demonstration Project

A. Project Development	1
B. Kuh-ke-Nah Business Case	3
1.0 Introduction to the Business Plan	4
2.0 Community Engagement	9
3.0 Smart Services	18
4.0 SMART Infrastructure	30
5.0 Organization	35
6.0 SMART Results	44

Tables

Table 1: Nexxia IP Connect Dedicated Access, Retail Pricing - October 1999	16
Table 2: Proposed Rate Structure (Thunder Bay Telephone) Regional Comparison of Bell Canada's Frame Relay Service to Best Price for the 807 Consortium	17
Table 3: Bell Canada Capital Investments to Provision Digital Infrastructure for Broadband Networking	24
Table 4: Strategic Infrastructure Upgrades for Extension of Digital Services to Remote First Nations Communities Under Bell Canada's DSSC	25
Table 5: Access to Digital Network Services for First Nations, 807 and 705 Area Codes	26
Table 6: Keewaywin First Nation Network System Requirements	38
Table 7: NAN-Wide Network Deployment and Capacity Development: 1998 - 2000	42
Table 8: Current Costs For Provision of Narrowband Internet Services Now Incurred by FedNor and First Nations SchoolNet	78
Table 9: Proposed Frame Relay Utilizing the New Digital Transport Service North of Red Lake (Existing DirecPC service as the Return Path)	79
Table 10: Northern Chiefs Integrated Video and Data Network Pricing Options	81
Table 11: Lac Seul Wireless Connectivity - 1 st & 2 nd Stages	85
Table 12: K-Net ICT Partnership Development and Funding Success (1993 - 2000)	101
Table 13: Broadband Development Opportunities	107

Figures

Figure 1: ONTelecom Transmission Infrastructure	19
Figure 2: Harnessing Information and Communications Technologies to Build Better Local Government in the Fort Severn First Nation	33
Figure 3: Network Diagram showing the proposed K-Net Broadband Network	39
Figure 4: Regional CAP Youth Coordinator Territories	61
Figure 5: Nishnawbe On-line Arts and Crafts Gallery	64
Figure 6: K-Net On-line Tutorial Screen	64
Figure 7: NAN-Wide Database Security Screen	69
Figure 8: NAN-Wide Database Administrator's Data Entry Screen	70
Figure 9: NADF Website - Aboriginal Buying Circle Page	75
Figure 10: Proposed Network Configuration for the Three Lac Seul First Nations Sites	83
Figure 11: NORTH Network Telehealth Sites – Current and Proposed	98

Appendices

Appendix 1: NAN-wide ICT Information Bulletins - May to October 1999

Appendix 2: North Spirit Lake Residential Telephony Report

Appendix 3: Keewaywin Residential Telephony Report

Appendix 4: Telesat TDMA Project Framework - July 2000

Appendix 5: Telecommunications Facilities Coordinator Manual, June 2000

Appendix 6: Community Access Coordinator Training Manual, June 1998

Appendix 7: NAN-wide Data Collection Form, August 1999

Appendix 8: Keewaytinook Okimakanak (Northern Chiefs) Council, ICT Resolutions

Development Context

K-Net is the information and communications technology (ICT) branch of Keewaytinook Okimakanak (Northern Chiefs Council). K-Net staff work out of facilities in Balmertown (administration), Sioux Lookout (network operations) and Thunder Bay (content development & design).

In Fall 1998, K-Net agreed to lead a NAN-wide initiative to accelerate the regional use and adoption of ICTs. Their work reflects an applied strategy to improve access to affordable telecommunications services by implementing, testing and refining community-based applications and delivery models. By Fall 2000, K-Net projects had animated significant positive change within the NAN telecommunications environment.

Many of the projects identified within the report were piloted in Keewaytinook Okimakanak First Nations and subsequently migrated to other NAN communities, regions and organizations. The transfer of these solutions reflects a healthy collaboration among regional First Nations, their federal and provincial partners and ICT vendors and suppliers.

It is anticipated that implementation of new initiatives – such as the K-Net broadband network, the TDMA pilot, the regional telehealth initiative and the Keewaytinook Aboriginal SMART communities demonstration project – will create a broader context for diffusing ICT tools, skills and knowledge and sustaining community capacity to use telecommunications for local development.

Acknowledgements

This report was made possible with funding from Industry Canada FedNor and HRDC. Many K-Net and Keewaytinook staff have contributed to this report. Brian Beaton, Dan Pellerin and Jesse Fiddler facilitated access to primary sources and suggested support materials related to the NAN-wide project. Darlene Rae's and Dawn Carpenter's experience supporting K-Net users provided a rich source of anecdotal evidence. Wanda Kakepetum helped identify documents in the filing system and Penny Carpenter entertained numerous requests for additional information.

Preface

Our First Nations have extensive plans to use telecommunications services to improve all aspects of community life, whether it be in the area of health care, government services, or economic development. We look forward to the time when it will be possible for community health care professionals to receive in-service training by interactive video from a medical specialist..Organizations such as K-Net are busy building communications networks and laying the groundwork for enhanced telecommunications in preparation for when we are fully connected.

Wawatay Executive Director, Garnet Angecone
Presentation before the CRTC, Jan. 25, 1999

Telecommunications has been a development priority for First Nations in the Nishnawbe-Aski Nation since the mid-1970s. Community demand for access to telephony, and later radio and television broadcasting, was channelled through Wawatay Native Communications Society. During this period, Wawatay established itself as a leading telecommunications advocate in NAN and facilitated improved access to affordable communications services.

Community-based Development

Wawatay approached this work from many different angles. It developed submissions for presentation to the Canadian Radio-television and Telecommunications Commission (CRTC), designed and delivered information and communications technology (ICT) training, participated in regional telecommunications pilot projects and built culturally relevant partnerships with telecommunications vendors and providers – e.g. translaphone and the syllabic telephone directory.

The diffusion of internet protocol and advanced networking capacities in the early 1990s signalled the introduction of new media services and promised new opportunities for First Nations to participate in the information economy. It also highlighted important gaps in the coverage and the capacity of the regional telecommunications system.

Some communities still had no telephones in their homes. People living in First Nations such as Slate Falls, North Spirit Lake, Keewaywin and Koocheching were “off the grid,” and unable to use plain old telephone services (POTS). Similarly, an aging telecommunications infrastructure prevented affordable local access to data services. Hybrid analog technologies could not reliably accommodate new subscribers, new services or new types of users.

Gathering Strength

The pan-northern telecom review process grew out of a regional initiative. In early 1998, the Sioux Lookout Telecommunications Committee - a body first established in 1993 - invited interested parties to discuss telecommunications needs in the Far North. The meeting lead to the development of a NAN-Wide Telecommunications Infrastructure Working Group (NWTWG). The Group identified its goal as:

Develop[ing] a strategic plan to establish competitive infrastructure in the remote First Nation communities that will carry voice, data, and video on a common platform to the residents of this unserved and underserved area.

Wawatay was asked by the group to assume the role of lead agency and to manage the development of three specific projects:¹

- Project 1: Monitoring of and active participation in the CRTC High Cost Serving Areas (HCSA) proceedings (FedNor).
- Project 2: Completion of stage 2 of a study about the telecommunications needs and potential throughout NAN (NOHF).
- Project 3: Staff and consultants to coordinate and support the development of different telecommunications initiatives across NAN (FedNor).

Wawatay submitted applications for funding in the Spring of 1998. That summer Wawatay undertook a restructuring process that restricted its ability to lead the NAN-wide telecommunications initiative. In August, 1998, K-Net worked with Wawatay and FedNor to complete the research necessary for full regional participation in the CRTC's HCSA hearings. As well, the NAN-wide Telecommunications Infrastructure Working Group recognized that Mushkegowuk planned to work on their own telecom development strategy and would also continue to participate in the Working Group. The Working Group supported Mushkegowuk's funding request to the Northern Ontario Heritage Fund (NOHF) for the development of a regional telecom infrastructure strategy for the James Bay Coast.

¹NAN-wide telecommunications was also a focus area for FedNor's Aboriginal Working Group (AWG) and their Telecommunications sub-committee. In 1997-98, these bodies examined the status of telecommunications in Northern Ontario and developed recommendations to improve existing infrastructure. Zeatha Arcon represented NAN on this committee. In August 1998, Ms. Arcon asked K-Net's Technical Director, Dan Pellerin, to continue in this capacity.. Buteo Networks Incorporated published a final draft report in November 1998. The report identified priorities, analysed gaps and opportunities and developed a strategic context for Aboriginal communities in the North. The final report was published by FedNor in 1999 (<http://fednor.ic.gc.ca>).

In September of 1998, Wawatay recommended that K-Net take on the advocacy, research and project planning work that had been identified by the working group.² K-Net's experience building ICT applications and extending wide-area data connectivity provided new expertise for accomplishing the telecommunications work identified in the third project.

A NAN-Wide Telecom Project

K-Net assumed the lead role for the NAN-Wide project in October 1998 and developed a joint FedNor/HRDC proposal. The terms of the proposal identified the preparation of a business plan for the development and maintenance of a NAN-wide affordable telecommunications network to address the telecommunications needs of both service agencies and communities. Specifically, the plan identified

- Inventories of both agency and community telecommunications needs (NAN-wide database);
- Infrastructure and application design to meet those needs;
- Training and business development strategies to build community capacity to use the technology effectively;
- Application for training and capital funds to implement applications and infrastructure.

A NAN Working Committee was established to monitor project progress and to provide direction for implementation across the region.³ Since then, K-Net has applied this framework to dozens of information and communications technology projects within the Nishnawbe-Aski Nation. What began as a paper process has become a series of concrete projects that have enabled local communications capacity throughout the Nishnawbe-Aski Nation.

K-Net has met and worked closely with Aboriginal organizations and First Nations to plan and install ICT infrastructure. It has deployed staff to assist in the development of local ICT telecom projects, support tribal area telecom processes, advise on the design and repair of community networks, procure ICT technology, train local technicians and

²Wawatay's recommendation was supported at the 5 November 1998 meeting of the NAN Infrastructure Working Group.

³As of April, 1999, membership included: Deputy Grand Chief, Goyce Kakegamic (NAN), Grand Chief, Lawrence Martin (Mushkegowuk), Shawn Batise (Wabun), Colleen Littledeer, (IFNA), Gord Bannon (Matawa), Bob Popovich (Shibogama), Al Morrison (Windigo), Garnet Angecone (Wawatay), Wes Luloff (NAPS), Mike Belliveau (NADF), Jennifer McKenzie (NALS), Alvin Crane (Zone Hospital), Elizabeth Kiyawasew (Sioux Lookout First Nations Health Authority), Ziggy Beardy (SLAAMB), Selma Poulin (NODIN), Diane Dunford (NNEC).

develop, produce and update cultural content. K-Net has also used its staff to develop innovative connectivity solutions that make the best use of resources in places where data connections are very slow.

In December, 1999 FedNor and HRDC amended the terms of the NAN-wide project to include the development of a SMART project plan. The SMART project plan was designed as a test-bed for implementing advanced ICT services in First Nations across Canada. It provides a practical vision for building First Nations networks and implementing broadband telecommunications services that meet local development priorities.

Innovation By Tradition

K-Net, like Wawatay, has approached telecommunications from many different angles. In each case, the focus has been on using telecommunications as a tool for community development. The project work has been supported by a diverse community base that includes Chiefs, parents, youth, technicians, administrators and program officers. K-Net has had the opportunity to see how NAN First Nations, institutions and representative organizations have applied ICTs to make practical improvements in the way people work and live and to demonstrate the social and economic benefits of an improved and affordable telecommunications environment.

This report reflects an applied/lessons learned approach. It summarizes 24 months of work – and the efforts of countless individuals – engaging communities, building capacity and forging partnerships. Part One documents regional initiatives to extend and improve access to communications. It surveys K-Net's role coordinating and sharing information, upgrading infrastructure, developing network systems, creating and delivering training and designing, implementing a NAN-wide database and leveraging sustainable applications. Three mini-case studies illustrate the processes that K-Net undertook and the partnerships it facilitated to build effective regional telecommunications projects.

Part Two describes the Kuh-ke-nah SMART First Nations project as a demonstration of how ICTs can be used across NAN to improve the quality and level of services, support self-governance and renew community economic and social development. It highlights the importance of partnership development and community engagement in the development of ICT projects. The SMART business plan illustrates how ICTs can be designed to address broadly-based goals and objectives and exploit new network service capacities.

Next Steps

This report reviews the beginning of a development process. It demonstrates how one organization has worked with many community-based and regional partners to initiate positive change. Similarly, it is a proof-of-concept that shows how various technologies and approaches have been adopted, applied and integrated into everyday life. The report suggests that many of the projects and approaches are transferable and can be implemented on a regional basis. It is also a formative document that proposes NAN-wide opportunities for ICT-based development strategies, an openness to new forms of cooperation and collaboration and the need for strong leadership in the work that lies ahead.

Executive Summary

Well I live in a small community near Lac Seul. What i do here is that I trap and hunt during the cold seasons. During the summers I work on housing or renovations, and during the week-ends I walk around patrolling our community to ensure that there isn't any kind of violent happenings that may go on. For my time alone I enjoy playing the guitar with my friends, who are all musicians, and have a good time. I guess that about does it for what I do on my reserve. I do hope who ever reads this will reply with great intentions, because I really enjoy making and meeting new friends.”

Message posted in the K-Net **Booshoo** Conference

This report summarizes an applied strategy by K-Net Services to connect Nishnawbe people and communities by accelerating the adoption and use of information and communications technologies in the Nishnawbe-Aski Nation. The aim of this strategy was to build a business case for extending ICT access and investment in NAN First Nations. The focus of this report is on the applied dimension – what was done and what results were achieved.

Many of the desired outcomes have only recently been realized. It has taken about 24 months to build the relationships and the partnerships to implement and complete major infrastructure and applications projects. Similarly, it has taken the better part of two years to build local network capacity, transfer telecommunications competencies and diffuse ICT skills and knowledge.

Charting A Course

During the two years that this project covers, K-Net has worked with its partners to produce impressive results. Their staff have engaged farflung communities in telecommunications development and have effectively introduced formative and positive changes in the ICT environment.

These initiatives have grown from two sources. They reflect K-Net's engagement with individual First Nations - the development of community-based solutions to meet local needs and priorities - and their commitment to addressing broader, regional issues. Much of this work is captured in recommendations made, in 1998, to the FedNor Aboriginal Working Group Telecommunications Sub-Committee. Their analysis of telecommunications needs and gaps in Northern Ontario recommended that “Aboriginal communities, commensurate with their financial capabilities, and government should:

- ▶ collaborate and invest with major telecommunications service providers to provision basic local and long distance phone service and modern digital network access to all Aboriginal communities;
- ▶ invest in the development of local dial-up Internet service in all Aboriginal communities;
- ▶ invest in state-of-the-art local area networks (LANs) to connect computer systems in individual community offices;
- ▶ invest in the establishment of Municipal Area Networks (MANs) in First Nation communities where multiple sectors of a community can share bandwidth and technical resources;
- ▶ invest in connecting MANs to large community based networks (CBNs) for cost savings through the bulk purchase of telecommunications services and technical expertise;
- ▶ invest in computer and Internet training at all levels, from office to home use;
- ▶ funding sources should invest in designs that are modular [interoperable/open systems]...
- ▶ continue to fund smaller initiatives that conform to one or more of the objectives above. At the same time, funding sources should encourage projects that provide the greatest benefit to the widest geographic and organizational scope of communities (1999: p. 3).⁴

Results-based Development

The list that follows can be read both as a recommendations checklist and as a measure of organizational performance. The data described below are indicators that track key aspects of telecommunications and development in NAN. They show that K-Net has been successful in developing working relationships with many partners across a broad spectrum of projects and that it has introduced a functional model for integrating the interests and capacities of NAN First Nations in determining their local and regional telecommunications environment.

Affordable Network Access

K-Net negotiations with Bell Canada have substantially reduced the cost of regional access to broadband services. In 1998, published tariffs indicated per community access at almost \$7,000 per month. K-Net's MOU with Bell Canada identifies an aggregated [bulk purchase] per community cost of approximately \$3,500 per month for ATM switched guaranteed bit rate services and \$1,840 per month (Christmas sale price,

⁴The report also recommends regulatory intervention to widen local calling areas for widely dispersed Aboriginal peoples with "family, tribal or cultural ties."

regularly approximately \$3,650) for 1.544 mbps frame relay access – a net decrease of between 48% and 74% in the total cost of network access.

Growth in Digital Service to NAN Communities

In 1998, none of the 52 NAN communities could purchase full access digital broadband services. In July 2000, these services were available in seven NAN First Nations. K-Net forecasts that this number will triple to 20 First Nations by July 2001 as a result of an investment of almost \$10 million from Industry Canada - FedNor. In September 2000, K-Net implemented a “proof-of-concept” broadband network in Keewatinook communities. The following month, K-Net and Telesat Canada successfully tested a broadband solution for satellite-based communities.

Local Area and Municipal Area Networking

A local area network connects all offices within a facility and a MAN connects the major community institutions (the school, the band office, nursing stations, constabulary) and provides a single source of live internet access. In 1998, K-Net developed and implemented an ethernet LAN/wireless MAN solution in Keewatinook communities. Since then, this approach has been adopted by nine other First Nations.

Network Design and Strategy Development

In 1999/2000, K-Net assisted with the development of three technical strategies and more than 20 networking and broadband development proposals. Most of these products have been submitted for funder consideration and approval.

Capacity Building

Between 1998 and 2000, K-Net managed three regional networking training programs, filling almost 50 training spaces in 17 communities. In addition, K-Net has provided technology support and training for the First Nations Band Manager Training Institute, the Aboriginal Teacher Assistant Program, and the NTEP program. K-Net has also developed on-line training tutorials and provided specialized skills development programs on an as needed basis.

Community Access to the Internet

In 1998, only six communities had established public computer facilities where people could access the internet. This year, people in 35 NAN First Nations have access to community computing and internet sites.

Helpdesk Services

The K-Net SchoolNet helpdesk service has seen a steady increase in the number of support calls since it began in 1996. The HelpDesk fields about 10 calls per day for technical assistance in both hardware and software applications. K-Net Services employs a full-time technician to address Helpdesk issues. In addition, K-Net staff regularly field hardware and software questions on the K-Net Conferencing system.

K-Net e-Mail Account Penetration

In 1998, there were approximately 1200 active K-Net accounts⁵ The majority of these accounts were users dialling in to check their messages on the K-Net conference system. In October 2000 this number had more than doubled. Nearly 3000 active K-Net accounts were registered.

Website Utilization

In 1998, no NAN First Nations and few First Nations organizations maintained their own websites. Today, more than a thousand First Nations youth maintain web pages on the K-Net server, more than 30 First Nation communities have produced homepages and many First Nations organizations have used K-Net to research, host or develop their websites. For example:

- Sioux Lookout Area Aboriginal Management Board: <http://www.slaamb.on.ca>
- Windigo Tribal Council: <http://www.windigo.on.ca>
- Shibogama Tribal Council: <http://www.shibogama.on.ca>
- Wabun Tribal Council: <http://www.wabun.on.ca>
- Matawa Tribal Council: <http://www.matawa.on.ca>
- Independent First Nations Alliance: <http://sl.lakeheadu.ca/~ifna>
- Nishnawbe-Aski Nation: <http://www.nan.on.ca>
- Northern Nishnawbe Education Council: <http://www.nnec.on.ca>
- Oshki-Pimache-O-Win: <http://www.oshki.ca>
- Nishnawbe-Aski Police Services: <http://www.naps-net.org>
- Nishnawbe-Aski Legal Services: <http://www.nanlegal.on.ca>

The K-Net website has also provided a point of regional access for First Nations users. Between September 1999 and October 2000, the number of daily visits almost tripled (growing from 199 to 755). During the same period, the number of monthly hits grew by more than four times. In September 1999, the K-Net website was registering almost 165,000 hits per month. By October 2000, that number had increased to more than 673,000 hits per month.

⁵An account is considered to be active if the user logs on at least twice in the previous month.

Building Knowledge With Results

The outcomes of the two year NAN-wide strategy make a business case. They show near universal broadband access, an aggregated market for advanced telecom services, pent up demand by diverse (health, justice, and educational) applications providers, growing digital literacy rates among users, human resource development in key sectors, design and successful implementation of technological solutions that address specialized regional needs and the emergence of an affordable and effective networking model. A personal view of network development can be viewed at: <http://knet.on.ca/Madeline-story.htm>.

These trends are supported by K-Net's leadership role in First Nations ICT development. For the past two years, K-Net has developed models for effectively deploying networks and network services. Their designation as the SMART Aboriginal demonstration project for Canada will ensure that this applied work continues. SMART will allow K-Net to couple high speed networked connectivity and broadband application delivery with local facilities and community development goals.

The results achieved thus far have emerged from a "lessons-learned" environment. Best practices - strategic information, project designs, network advice and successful funding proposals - have been shared within a clearinghouse structure. Learning by doing has meant that new methods have been folded into future initiatives. This approach has helped to develop, incubate and transfer practical and affordable projects for telecommunications and development in NAN.

Making ICT Happen

Industry Canada / FedNor's investment alone, of nearly five million dollars in ICT infrastructure and applications in Keewatinook Okimakanak First Nations is evidence of the financial commitment required to build a viable broadband network. This level of investment from different government programs and agencies is required to deliver a sustainable telecommunications strategy for all Nishnawbe-Aski Nation communities.

Sound infrastructure, collaborative and affordable networks, best practices and community buy-in are building blocks for the next phase of ICT development in NAN. They establish a baseline for moving forward and a benchmark to measure new projects against. But they are only a point of departure. They too are further evidence of a broadly-based commitment to the sustainable telecommunications strategy for all NAN communities which can then be used by other regions across Canada.

The development of a fair and equitable telecommunications environment in NAN is recognized as an economic and social cornerstone for achieving and sustaining

community well-being. It also presents a formidable challenge for the NAN region. Addressing this challenge will rely, in part, on the expertise and resources provided by existing bodies, organizations and partners such as K-Net Services, the NAN-wide Telecom Working Group, INAC, FedNor, HRDC and Aboriginal Business Canada.

The challenge should also be addressed as an opportunity for the Nishnawbe-Aski Nation to share its vision for telecommunications development with Canada and the world. In the next phase of ICT development, NAN will play an important role determining the scope and scale of First Nations ICT applications – advocating on behalf of regional telecommunications interests, collaborating and negotiating with partners and developing new economy policies that address First Nations needs and priorities.

Next Steps

Moving forward on telecommunications development will require the focused commitment of First Nations, federal and provincial governments and private industry. The seven recommendations identified below, create a framework for building a sustainable shared ICT environment for Nishnawbe-Aski communities.

RECOMMENDATION #1

Aboriginal communities, relative to their financial capabilities, should collaborate with governments and major telecommunications providers and vendors to ensure that the telecommunications infrastructure in the Nishnawbe-Aski Nation (NAN) will deliver scalable high speed, two-way interactive video digital services at affordable prices to all homes and businesses by 2004.

RECOMMENDATION #2

Government should make new funds available to ensure that a critical mass of digitally literate First Nations people are trained in the operation, maintenance and repair of community-based ICTs by 2004. Training investments should encourage and support lifelong learning, address local ICT challenges and priorities and coincide with the extension of digital networks in NAN communities.

RECOMMENDATION #3

All government departments and agencies and public sector institutions should buy telecommunication services from community-based networks where they exist as their primary point of service delivery. The sustainability of these networks depends on the continued use, operation and maintenance of a shared First Nations interface by local, regional and national partners and programs.

RECOMMENDATION #4

NAN First Nations and government will use high speed networks to improve access to services for their members. Investments in ICT by government and other application providers should improve the level and quality of services available in each community and support the capital and operational needs of individual First Nations.

- Telehealth services will have an immediate impact on community well-being. Implementation of telehealth services should be a network priority and be sufficiently resourced to address the technical and human challenges that will accompany the introduction of a new approach to health care delivery.

RECOMMENDATION #5

NAN First Nations, their organizations, government and the private sector should jointly invest in the development of innovative ICT products and services. Resources should be made available for First Nations networks to assess community needs, engage research partners, incubate and deploy new ICT products and services.

RECOMMENDATION #6

K-Net should continue to support the development of telecommunications capacity in NAN. A NAN-wide Information and Communications Technology Working Group (ICTWG) should be formed and resourced to oversee the planning, integration and administration of NAN-wide networking projects.

RECOMMENDATION #7

The NAN Executive should identify ICT development as a priority area for economic and social renewal and engage federal and provincial partners to support the NAN-wide ICT agenda. Specifically, NAN should be resourced to advocate for ICT development opportunities in the Nishnawbe-Aski Nation.

H. Recommendations

Result: Standards for Community Access to Broadband Services

1. Aboriginal communities, relative to their financial capabilities, should collaborate with governments and major telecommunications providers and vendors to ensure that the telecommunications infrastructure in the Nishnawbe-Aski Nation (NAN) will deliver scalable high speed two-way interactive video (> 1.5Mbps) digital services at affordable prices to all homes and businesses by 2004.

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> The National Broadband Task Force (NBTF) should recommend that remote and isolated First Nations communities be the first connectivity priority for the roll-out of national broadband services. 	Industry Canada	On or before 31 May 2001
<ul style="list-style-type: none"> The National Broadband Task Force should recommend a funding mechanism for supporting community-based regional networking solutions. 	Industry Canada	On or before 31 May 2001
<ul style="list-style-type: none"> The provincial government should match all federal investments in the development of on-reserve telecommunications and ICT infrastructure. 	SuperBuild	1 April 2001 to 31 March 2004
<ul style="list-style-type: none"> Local area and community-wide networks should be standard features of all NAN First Nations. 	FedNor/Industry Canada, NOHF, INAC	31 October 2003
<ul style="list-style-type: none"> Community-based ICT champions will identify NAN-wide infrastructure priorities. 	First Nations, K-Net, NAN	On or before 30 October 2001
<ul style="list-style-type: none"> A construction plan should be established to achieve interoperable broadband delivery throughout NAN territories. 	K-Net, FedNor, Vendors & Carriers	On or before 31 January 2002

<ul style="list-style-type: none"> An action plan for achieving minimum connectivity requirements should be developed parallel to the NAN-wide connectivity policy. 	K-Net, FedNor	On or before 31 March 2002
<ul style="list-style-type: none"> K-Net should continue to promote the use and adoption of ICTs, oversee the implementation of telecommunications infrastructure and support the development of network systems and applications for NAN communities. 	K-Net, FedNor	1 April 2001 to 31 March 2004

Result: Enabling Information Communication Technologies (ICTs) Skills Development & Acquisition

2. Government should make new funds available to ensure that a critical mass of digitally literate First Nations people are trained in the operation, maintenance and repair of community-based ICTs by 2004. Training investments should encourage and support lifelong learning, address local ICT challenges and priorities and coincide with the extension of digital networks in NAN communities.

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> The computer literacy level in First Nation communities will be a key factor in determining the success and final degree of penetration and usefulness of broadband and in the success of major initiatives such as government online. In parallel with the roll-out of the results of the National Broadband Task Force it is recommended that a process be put in place to extend introductory computer training and support in First Nations with a particular emphasis on rural and remote regions of the country. 	Industry Canada	1 June 2001
<ul style="list-style-type: none"> The ICT learning needs within all NAN First Nations should be documented in a standardized format. 	HRDC, INAC, First Nations, K-Net	On or before 31 August 2001
<ul style="list-style-type: none"> ICT learning priorities and practical strategies for addressing ICT learning needs should be identified and supported 	SLAAMB & Other NAN AAMBs, Oshki, K-Net, NNEC, KiHS	1 January 2001 to 31 March 2004
<ul style="list-style-type: none"> The federal government should renew its commitment to the Community Access program and support local internet access for all First Nations communities. 	Industry Canada	1 April 2001 to 31 March 2004

<ul style="list-style-type: none"> On-line and face-to-face learning materials should be developed to meet local and regional ICT learning needs. 	Oshki, NNEC, KiHS	On or before 1 September 2002
<ul style="list-style-type: none"> Regional skills development funding should be identified and secured to ensure that ICT skills are appropriately transferred to NAN-wide learners. 	HRDC, First Nations, SLAAMB, other AAMBs	On or before 1 April 2002
<ul style="list-style-type: none"> E-commerce skills development should be targeted as an area of interest and supported by regional, provincial and federal agencies. 	NADF, ABC, ONAS, INAC	On or before 1 April 2002
<ul style="list-style-type: none"> A First Nations ICT skills advisory group should be convened to bring governmental departments and agencies, professional associations and First Nations together to jointly develop and deliver job-specific ICT skills enhancement programs for community-based staff (teachers & assistants, band managers, homecare workers, CHRs/CHNs, etc). 	Federal/provincial institutions & agencies, First Nations organizations, K-Net	1 September 2001 to 31 March 2003
<ul style="list-style-type: none"> Regional secondary and post-secondary institutions should develop and deliver community-based ICT credit courses and programs that address the needs of First Nations. 	Oshki, NNEC, Contact North, Lakehead U, Confederation College	On or before 1 September 2002

Result: Network Sustainability and Shared Access

3. All government departments and agencies and public sector institutions should buy telecommunication services from community-based networks where they exist as their primary point of service delivery. The sustainability of these networks depends on the continued use, operation and maintenance of a shared First Nations interface by local, regional and national partners and programs.

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> NAN should work with provincial and federal departments and agencies, such as INAC, Health Canada, MOH, Attorney and Solicitor-General, to ensure that they contribute to a sustainable ICT environment in NAN communities 	NAN, Health Canada, Solicitor-General, MOH, Attorney-General, MNR, MOT, INAC, ONAS, ABC	1 August 2001 and on-going
<ul style="list-style-type: none"> Wide-area and regional network services should be integrated to achieve the maximum value for each community at the most affordable price. 	K-Net, FedNor, Bell Canada, ONTel,	1 April 2001 and on-going
<ul style="list-style-type: none"> The administration and governance of the network should reflect First Nations control and collaboration between the network and its public and private sector partners. 	First Nations, Application providers	1 June 2001 and on-going
<ul style="list-style-type: none"> Pricing structure - Regional networks should receive access on the same basis and at the same price as schools, health care centres or telcos. Present national pricing of broadband exhibits huge regional price differentials. Programs resulting from the work of the National Broadband Taskforce must provide similar pricing levels regardless of location or distance from provincial centres and be available to all First Nations. 	Industry Canada	1 September 2001

Result: Facilitating Development & Deployment of ICT Services

- 4. NAN First Nations and government will use high speed networks to improve access to services for their members. Investments in ICT by government and other application providers should enhance the level and quality of services available in each community and support the capital and operational needs of individual First Nations.**
- Telehealth services will have an immediate impact on community well-being. Implementation of telehealth services should be a network priority and be sufficiently resourced to address the technical and human challenges that will accompany the introduction of a new approach to health care delivery.**

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> • Network application providers should work directly with First Nations to design and introduce ICT-based applications. Emphasis needs to be placed on identifying how their ICT-based services will improve the lives of the local population as well as the economic and social well-being of the community. 	First Nations, K-Net and NORTH, SLKT Zone Hospital, Solicitor-General, Attorney-General, INAC, Health Canada, Lakehead U, Con College...	On or before 1 September 2001
<ul style="list-style-type: none"> • A network clearinghouse should be established where service providers can combine their resources and collaborate on IT solutions and infrastructure projects. 	Application providers, K-Net	On or before 1 December 2001
<ul style="list-style-type: none"> • Network applications should be aggregated horizontally and vertically. Network access should mean that a broad range of services are available across a wide range of users. 	Application providers, K-Net	On or before 1 March 2002
<ul style="list-style-type: none"> • Government and application providers should ensure management and decision making processes integrate ICTs in all aspects of doing business. 	Government, Application providers	immediately

Result: Investment in First Nations ICT Innovation

5. NAN First Nations, their organizations, government and the private sector should jointly invest in the development of innovative ICT products and services. Resources should be made available for First Nations networks to assess community needs, engage research partners, incubate and deploy new ICT products and services.

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> A First Nations ICT Innovations Network should be supported with the aim of making NAN communities a net exporter of successful ICT processes and solutions to other First Nations in Canada and to Indigenous communities around the world by 2004. 	K-Net, CANARIE, CRC, TVO ntario, Telesat, AFN, NAN	1 June 2001
<ul style="list-style-type: none"> Government should invest in local ICT development circles to support ICT innovation and to ensure that ICTs meet community-based needs and objectives. 	Industry Canada, First Nations, Tribal Councils	1 September 2001
<ul style="list-style-type: none"> Pilot projects should be used to develop, implement and assess successful ICT solutions and strategies in NAN. 	Industry Canada, First Nations, Tribal Councils	1 December 2001
<ul style="list-style-type: none"> Projects should be carefully documented and be guided by learned best practices. 	Industry Canada, First Nations, Tribal Councils	immediately

Result: Regional Participation and Cooperation

6. K-Net should continue to support the development of telecommunications capacity in NAN. A NAN-wide Information and Communications Technology Working Group (ICTWG) should be formed and resourced to oversee the planning, integration and administration of NAN-wide networking projects.

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> A NAN-wide <i>ICT Working Group</i> (ICTWG) should be formed and funded to guide the planning, development and implementation of ICT services. 	K-Net, Tribal Councils, FedNor, NAN	1 June 2001
<ul style="list-style-type: none"> The ICTWG should monitor network development and lobby for improved telecommunication services across the region. 	K-Net, Tribal Councils, FedNor, NAN	1 June 2001
<ul style="list-style-type: none"> The ICTWG should establish and maintain strong communications links with all NAN stakeholders 	K-Net, Tribal Councils, FedNor, NAN	1 June 2001
<ul style="list-style-type: none"> The ICTWG should use the expertise and resources of existing bodies, organizations and partners to support the implementation of the next phases of ICT development in NAN. 	K-Net, Tribal Councils, FedNor, NAN	1 June 2001
<ul style="list-style-type: none"> The ICTWG should work with community and regional networks, First Nations and telecommunications providers to ensure that telecommunications infrastructure, services and pricing meet the long-term goals of NAN First Nations 	K-Net, Tribal Councils, FedNor, NAN	1 June 2001

Result: Encouraging Broad-based ICT Access and Use

7. The NAN Executive should identify ICT development as a priority area for economic and social renewal and engage federal and provincial partners to support the NAN-wide ICT agenda. Specifically, NAN should be resourced to advocate for ICT development opportunities in the Nishnawbe-Aski Nation.

Actions	Lead Agency /ies	Timeline
<ul style="list-style-type: none"> An ICT Liaison should be engaged to work directly with NAN First Nations and the Tribal Councils to document local barriers, communicate community-based solutions and animate engagement in ICT developments. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 April 2001
<ul style="list-style-type: none"> Funding should be secured to support a full-time NAN telecom advisor and a part-time web designer/administrator 	ICTW G, Tribal Council First Nations, NAN	on or before 1 April 2001
<ul style="list-style-type: none"> All NAN First Nations will have the opportunity to participate in the planning, development and implementation of advanced ICT services for their communities. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 June 2001
<ul style="list-style-type: none"> An ICT vision document should be developed to guide the design and implementation of NAN-wide ICTWG policies and initiatives. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 April 2002
<ul style="list-style-type: none"> NAN should work with the ICTWG to identify key telecommunication development strategies. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 June 2001
<ul style="list-style-type: none"> NAN should work closely with municipal, provincial and federal bodies to ensure that ICT initiatives are complementary. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 April 2001
<ul style="list-style-type: none"> All NAN First Nations should send two representatives to a regional SMART First Nations conference. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 November 2001

<ul style="list-style-type: none"> The NAN Executive should identify ICT development as a priority area for economic and social renewal and engage federal and provincial partners to support the NAN-wide ICTWG agenda. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 April 2001
<ul style="list-style-type: none"> The high-cost service area decision is being implemented at a very slow pace for the many communities who currently face a delay of several years before receiving any benefit. It is recommended that the telecommunications companies agree to accelerate their plans to bring dial-tone and Internet to all Canadians within one year. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 April 2002
<ul style="list-style-type: none"> An ICT development roundtable should meet yearly to guide the use of ICTs to achieve the economic and social aims of NAN First Nations. 	ICTW G, Tribal Council First Nations, NAN	on or before 1 September 2001