File Number: **ABO-13**
Kuh-ke-nah Network (K-Net) of Smart First Nations

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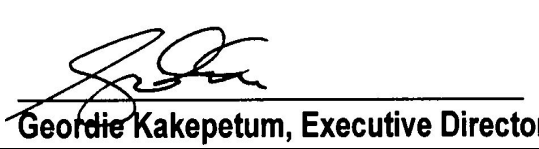
Signatures:



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SECTION B: Summary for Publication (1 Page)

1. Description of the proposed project

Five First Nations in northwestern Ontario are harnessing information and communications technologies (ICTs) to improve local access to health, education and information services and to establish new links with Canada and the world. The people of Fort Severn, Keewaywin, Deer Lake, North Spirit Lake, and Poplar Hill will share the Kuh-ke-nah network[1] to build a new SMART community.

Community consultations showed widespread interest in using ICTs to enhance the delivery of human services and to support cultural and community development goals. During the next three years, the Kuh-ke-nah network will work with its partners to develop and deliver a range of SMART services. Each First Nation will share a common interface and be tied to the network through Community Information Technology Centres (CITCs) and a high speed regional Portal.

The CITCs will provide local access to standard and enhanced network services and coordinate local skills development and technology transfer. The Kuh-ke-nah Portal will provide an electronic gateway to community-based information and local commerce, governance, training and cultural applications. Other SMART services include the introduction of regional on-line high school and distributed health information access, the design and implementation of a data warehousing strategy and the development of specialized internet router/caching technology.

2. How the project fits in to the communities' overall vision of the future

The Kuh-ke-nah demonstration project is part of a broadly-based community wellness strategy. ICTs are viewed as new tools that can be applied to old problems. Kuh-ke-nah communities will be evaluating ICTs to see if they can effectively overcome longstanding geographic, social and economic barriers, incrementally improve the level and quality of human services, and sustainably meet the long-term needs of First Nations.

3. Benefits anticipated to the communities involved

Designation as a SMART communities demonstration project places Kuh-ke-nah in a leadership role. Regional use of ICTs will mirror the conditions and concerns of Indigenous people in Canada and around the world. It is important for us to share lessons learned from this project and to distribute the benefits of our experience among developing and emergent nations.

Communities aim to reap concrete benefits. They will use ICTs to get better access to health care and education. The see the opportunities that new media present for revitalizing cultural practices and the ways that local languages are spoken and remembered. Keewaytinook First Nations also see how new skills and knowledge can help make each community sustainable. ICTs offer youth new incentives for staying in and contributing to their communities, they make working together and sharing resources easier and they will reduce isolation as a limiting factor in the growth and development of our First Nations community.

[1] Kuh-ke-nah is an Oji-Cree word that means everyone-together. Regionally, people know Kuh-ke-nah by its short form – KNET Services.

SECTION C: Project Description

1.0 Introduction to the Business Plan

1.1 Restate the vision

Keewaytinook Okimakanak communities share a collaborative vision for community wellness and development. They call their vision the Kuh-ke-nah Network of Smart Communities – an integrated scalable network resource that each community will contribute to and draw from.

1.2 Outline the goals and objectives of the projects

The goal of this project is to demonstrate how First Nations communities can collaboratively use ICTs to re-determine their relationship with Canada and the world. This goal is embedded in meeting three primary objectives. ICTs must contribute to community well-being in a tangible way; they must support community autonomy, self-determination and governance; and, ICTs must enhance community capacity for sustainable development.

1.3 What Smart services will be provided

Kuh-ke-nah is proposing a bundle of SMART baseline services. These services will address community demand for ICT-enabled solutions and establish a community platform for introducing advanced informatics applications once the demonstration project phase has been concluded. These services are:

Keewaytinook On-line Secondary School: Kuh-ke-nah is supporting the phased development of on-line access to high school for youth in the five Keewaytinook communities. The pilot phase will evaluate the experience of Grade 8 students enrolled in an on-line Native studies course. Grade Nine and Ten curriculum will be developed, applied and evaluated during years two and three.

Community Information Technology Centres: Community Information Technology Centres will provide a hub for SMART service access and training in each community. A local Coordinator will run the Centre and organize technology transfer workshops and demonstrations. The Centre will provide access to IP videoconferencing, workstations for the disabled and for multi-media production and act as a central office for the community Coordinator, Network Technician, and Content Developer.

Kuh-ke-nah Portal: The Portal is a community of communities – a high speed WAN-based gateway that reflects local character and priorities. The Portal aims to encourage an interactive and collaborative relationship with users by siting iterative web resources that draw on -- and benefit -- local people, organizations, and businesses. The Kuh-ke-nah Portal will also be a showcase for the governance projects, cultural practices, and human services that the network animates and supports. A Portal prototype is accessible on-line at: http://knportal.knet.on.ca/

Data Warehouse: The Data Warehouse Initiative will facilitate the development and agreement on data policies, procedures, standards and definitions. It will also lend technical support to the development of community and regional database projects.

Distributed Health Information Call Centre: The Kuh-ke-nah network provides an opportunity to support the development of an integrated IP environment for dynamic (data/voice) health information delivery. The Call Centre project meets immediate community needs for culturally appropriate homecare services and permits the phased integration of familiar (telephone) and new (database) technologies.

Caching/Router Project: The aim of this SMART service is to research, evaluate, and market a caching solution that will meet the needs of small schools, and community access sites that are remote and or isolated. These sites are characterized by high user demand coupled with a high latency, low bandwidth connection such as the SchoolNet MSAT/DirecPC program or those with DirecPC and dial-up access.

1.4 What does Kuh-ke-nah hope to accomplish?

Kuh-ke-nah wants to show how communities can harness ICTs to overcome longstanding barriers to geographic, social and economic isolation.

1.5 How will progress against goals be assessed?

Kuh-ke-nah will employ Results-based Management (RBM) processes to monitor results, track outcomes, assess outputs and schedule activities within regional and community network environments. Community Information Technology Committees will provide feedback to local Band Councils and directly to project managers through each CITC Coordinator. Network operations and plans will be assessed annually and community engagement workshops will revisit local plans and review progress against community benchmarks on a yearly basis.

1.6 What is the population reach of the SMART services?

Approximately, 2,800[2] people live in Keewaytinook Okimakanak communities. Deer Lake is the largest community with a total population of 850. There are 314 people living in North Spirit Lake, 316 people living in Poplar Hill, 470 people live the community of Fort Severn and 539 people reside in Keewaywin.

1.7 Do KO communities provide services in both official languages?

More than 60 percent of persons living in Fort Severn, Poplar Hill, Deer Lake, Keewaywin and North Spirit Lake speak Cree, Ojibway or Oji-Cree. Accordingly, staff will be primarily focused on responding to the needs of Aboriginal language speakers. However, KNET retains two bilingual staff who have prepared bilingual materials in the past (http://www.knet.on.ca/direcpcfrench/direcpcfrench.zip) and support francophone communities as part of the First Nations SchoolNet HelpDesk.

1.8 Describe ICT defined infrastructure now in place

The technical infrastructure in each community accommodates local wireless networking at 1.5 mbps. Outbound internet traffic is routed through dual 4,800 baud modes (combined for 9,600

[2] This figure reflects the status Indian population on reserve (2,489) and seasonal workers employed by the Band such as teachers, health workers, and contract workers (300). Data is drawn from: the Sioux Lookout Area Aboriginal Management Board's 1998 *Human Resource Study.*

baud) and inbound internet traffic is routed off satellite at up to 384 kbps. Computer access is broadly-based. All health, educational, policing, small business and Band administrative centers utilize networked computer-based systems. Two communities distribute cable television services and two communities have single toll phone access to the PSTN. Residential telephony will be available in both of the latter communities by November 2000.

1.9 Describe the proposed ICT required to successfully implement the demonstration project

Kuh-ke-nah proposes to build a broadband IP network that will terminate in local Information Technology Centres (CITCs). Each Centre will provide a suite of access services (workstations for the disabled and for multi-media production, a computer lab, and a H.323 compliant videoconferencing system). The CITC will interconnect with a local cable headend for distribution of high speed data to the home, and to the Band Office, the Nursing Station, the School, and the Nishnawbe-Aski Police Services building.

1.10 Use the activity schedule below to chart the 3 year time frame for achieving objectives:

Milestone	Description (points)	Anticipated Completion Time (in months)	Estimated Cost ($)
Effective Project Management	• Successful Implementation of Project • Project On-time • Project On-budget • Timely and accurate reporting • Board satisfaction • Results-Based Management	36 months	1,040,000
Core Network Established and operational	• Regional hubs connected and operational • Broadband to local hub • Broadband to school, Band Office, Police, Nursing Station, and cable head end • Local network technicians hired and trained Construction of local cable plant (HS internet to home) • Installation of UBR	12 months	3,752,487
Network Reliability, Testing and Burn-In	• On-going maintenance, monitoring, testing and repair • Traffic management and upgrade • Delivery of VPN services	12 months	see above
Deliver Enhanced Services	• Voice over IP to institutional customers • Extended VPN routing services	24 months	see above
Community Information Technology Centres Open	• Centres renovated, equipped with furniture and hardware • New Community Access Centres open • Multi-Media Production and Disabled Access • Videoconferencing capacity • Model CITC built/open	10 months 10 months 11 months 12 months 24 months	1,518,800
CITC Coordinators hired/trained	• Coordinators animate local interest and train new users in use of technology	18 months	256,000

Router & Caching Project Implemented	• Router in full production • Develop and test caching algorithms • Production of caching/router unit • Product marketing and licencing	6 months 10 months 12 months 15 months	121,000
Oji-Cree Health Knowledge Database	• Create on-line Oji-Cree knowledgebase • Conversion to syllabic/roman orthography data format • Pilot testing	24 months	387,000
Call Centre Operational	• Access to health information systems and rapid response • Provision of on-line training and support services	24 months	560,000
On-line High School Pilot	• 50 students enrol in pilot • 1:1 computer to learner ratio achieved in all communities • Annual evaluations completed • On-line High school fully operational	3 months 24 months 36 months 36 months	354,850
Data Warehouse	• Agreement on community-based Data Policies, Standards and Definitions • Construction of specialized databases, e.g. geographic, cultural, health, education, and employment databases	18 months 18 months	366,000
Portal	• Portal prototype on-line • Local content producers hired and trained • WAN-based Portal on-line • Local portal development and provision of multi-media training	3 months 10 months 12 months 30 months	577,000
Cycle of Improved Practice	• Implement Communications Plan • Comprehensive Evaluation Plan in place • Regional Conference YR1 • CITC Coordinators fully trained to gather data and animate local interest in use of new media • Community-based Capacity to Adapt and Direct Project • National On-line Conference (Yr2) • International On-line Conference (Yr3)	6 months 12 months 12 months 15 months 18 months 24 months 30 months	873,000
Applications Development & Marketing	• Successful implementation of the sustainability plan • Establish and maintain partnerships • Enable and market new applications and delivery of network services		543,100
		Total Estimated Costs	**10,349,237**

2.0 Community Engagement

2.1 What lessons were learned (SWOT) from the major event(s) mentioned in the Letter of Intent?

K-Net has provided integrated distributed systems services and support since 1995, a listing of all K-Net projects is available at: http://knet.on.ca/services/index.html. The following projects and services were identified in our letter of intent and speak to our organization's capacity to deliver and support technology services, coordinate and manage regional infrastructural projects and to partner with First Nations organizations, government agencies, and private businesses.

A. Lessons Learned From Delivering Computer Training and Support Services

1. The need for these services is great and users need to know that there is turnkey support whenever they encounter problems.
2. First Nations and their organizations prefer to work with other First Nation groups but there is always the long term objective to be doing it themselves.
3. Programs must accommodate a wide variety of learning styles and delivery methods
4. Organizations will pay for computer services once they are confident that there will be ongoing support, empathy with local needs and potential for local development.
5. The cost of marketing and expanding training and support services to make them sustainable on their own usually does not generate enough revenue to cover the expenses incurred. Expansion into other marketplaces requires additional resources and will take away from the delivery of these services into the First Nations which require this support.
6. The changing environments (hardware, software, services) make this service very expensive to maintain and requires some form of subsidization from other programs.

B. Lessons Learned from Provision of First Nations SchoolNet Northern Ontario Helpdesk Services (since 1996)

1. Helpdesks are important tools for regional organizations. They reinforce competence and maintain strong links between K-Net Services and First Nations as they develop the skills required to develop and operate their own networks.
2. Call Centres - support desks have plenty of excess outbound capacity. There is potential for Call Centre staff to initiate follow-up calls - to review what is happening in each community and to encourage and support developments. Ideally, this would work within regional environments - such as infrastructural developments across the Nishnawbe-Aski Nation.

C. Lessons Learned from Coordinating/Animating Community Access Site Development / Operation / Maintenance

1. Local conditions - general lack of available facilities unless funding is available - makes it difficult to adequately support staff/community and maintain a single ICT.
2. Reliable local connectivity and technical support is presently an issue for many sites.
3. Staff turnover due to low wages makes it difficult for local users who want to use and access new applications and services.
4. Accessibility in most offices is limited to 9 to 5, leaving the access site as the single point of access in some of the communities during after hours.

D. Lessons Learned from Coordinating/Organizing Regional First Nations Telecom Infrastructure Development and Improvement Initiatives

1. Sharing best practices and information (such as successful planning and resourcing strategies) is a full time job that entails answering questions and supporting other groups as they begin this journey into the world of ICTs
2. Transferring skills and ownership of some of these initiatives, as in the case of the local telecom infrastructure development initiatives, requires collaboration, ground work, support and good communication strategies to ensure that project requirements are fulfilled.

E. Lessons Learned from working on IT training projects with the Sioux Lookout Area Aboriginal Management Board (SLAAMB)

1. Employment and Training programs funded under SLAAMB and delivered at a distance require extra coordination and management to ensure all the project employees are fulfilling their job duties (daily monitoring of activities).
2. Some employees consider the job to be training instead of a career, requiring a lot of role and responsibilities clarification and documentation.
3. Self directed learning and employment opportunities support motivated and determined individuals to use their own creativity and innovation to find solutions.
4. Different employment and training funding programs are available but funding is always limited due to the local needs and because competition for these funds is intenstive.

F. Lessons Learned from Coordinating Youth Oriented Science & Technology Camps

1. Support for youth initiatives on a regional basis requires broadly-based buy-in to ensure successful implementation - e.g. from local Education Directors.
2. The camps provided new learning and recreational opportunities for local youth with planned and supervised activities that involved the use of technology with a strong local and traditional science focus.
3. High school graduates or post-secondary students were able to make the camps work best because their education and experiences supported them to take on the tasks assigned.

2.1.1 How will these lessons learned help to successfully implement SMART?

K-Net's experience coordinating regional activities and managing distributed technology projects constitutes a unique base of knowledge for successfully implementing and guiding new initiatives in First Nations communities. Project Management will share lessons learned and establish deployment guidelines in the following areas: training and support services, community access, and regional technology initiatives.

Training and Support Services

1. Training programs are required for all employment opportunities within the field of Information Communication Technologies (ICTs);
2. Distance education delivery strategies work best for self-motivated and determined individuals who have a clear understanding of their responsibilities and are supported.

3. Detailed screening criteria (job descriptions, skill asset inventories, clearly stated expectations) are key to identifying, securing, and training the right project staff.
4. Community-based staff need to be engaged in continuous training and improvement cycles to ensure they maintain high skill levels.

Community Access

1. Community access sites are open, welcoming and comfortable environments.
2. Community access site activities should be structured to use staff skills for improved technology transfer and use of applications.
3. Community Access sites should be places where new technologies and relevant techniques are demonstrated and focused training is provided.

Regional Technology Initiatives

1. Develop and maintain strong financial, management and recording keeping systems right from the start of each project. Ensure all staff involved in each project are maintaining good records of their time and activities for audit purposes.
2. Establish communication expectations for regional and local staff and implement support systems to ensure that everyone is aware of what is happening that can affect their areas of responsibility.
3. Develop and actively maintain strong partnerships and buy-in at all levels (community, organizations, management, political leadership, corporate, etc). This is critical for telecommunication projects to be successful in all phases of development from the initial needs identification phase to the implementation and operational phase.

2.2 What community needs will be addressed by SMART implementation?

This business plan draws on community-based needs assessments, stakeholder follow-up, and regional and local ICT planning workshops. The SMART consultation process began in May, 1999 and concluded in early December. In addition to community consultation and planning Project Working and Reference groups have been meeting regularly since October of 1999. These groups contributed planning expertise and input and provided an external sounding board for vetting project challenges and opportunities. Summary reports and proposed SMART plans were presented at regional Chief's meetings in June, November and December of last year.

The May consultation gathered community-wide data about the ways that ICT-based applications could benefit Keewaytinook communities. Information sessions were held in each community and formal interviews were conducted with sector representatives and local people who expressed interest in using information technologies. The final report is on-line at http://smart.knet.on.ca/documents/CONSULT.html.

Community responses indicated that education, training, and health applications were seen as ways to introduce new standards of basic service in Keewaytinook communities. The report identified community well-being as a desired result of applying ICTs in the delivery of health, training, and education services. This data also demonstrated local demand for enhanced broadband services and identified core business and institutional service providers who could use a regional network to deliver, enhance or augment community-based services.

Two focus consults were held to provide specific information about the ways that ICT's could meet education and health service needs. These consultations were organized and tabulated by Keewaytinook Okimakanak regional Education and Health Directors.

The Education consult centred on the viability of an on-line high school in Keewaytinook communities. The regional Education Director traveled to each community and met with the following groups at individual meetings: Chief and Council (5 communities), Local Education Authority (3), Director of Education (5), School Principal (5), Grade 8 Teacher (5), Grade 8 Class (5), Grade 8 parents - informally, Community Radio (1), Parent's night (1). At each meeting, the regional Education Director explained the vision and then solicited feedback about where stakeholders saw challenges and opportunities.

The health consult was organized by the regional Health Director and elicited feedback from local health directors about ways that telehealth could be most effectively applied to meet service commitments in each First Nation. Local Health Directors were sent a short survey in late November. Their responses indicated that Training for front-line staff and community workers (i.e homecare support workers) and mental health consultations were the highest priority with diabetes education next on the list. Medical checkups, treatment and diagnosis, doctor contacts and reduced visits were identified as tier two priorities.

K-Net's partnership with the University of Guelph's Don Snowden Centre provided an additional channel for understanding community use and acceptance ICTs. The PACTs research project identified issues central to sustaining a community-based networking environment and suggested strategies for engaging local stakeholders in the development process. Telecommons Development Group (see TDG, 5.5) was invited to apply this perspective - its tools and techniques - in two SMART engagement workshops.

Working with Telecommons Kuh-ke-nah integrated its community engagement processes with results-based management (see 5.1.1). This parallel process was used to re-examine the vision with stakeholders and to prepare the business plan. These community engagement processes involve stakeholders in visioning and articulating the results they wish to achieve for their communities. The processes also enable stakeholders to take part defining specific outcomes and in planning the activities that will achieve those outcomes. Stakeholder involvement in articulating agreement on performance indicators ensures that the project stays aligned with the results desired by stakeholders.

The TDG planning model was introduced at a regional planning workshop held in Red Lake in early November 1999 (see http://smart.knet.on.ca/conference.html)[8] and at a week long engagement session in Fort Severn (see http://smart.knet.on.ca/fsworkshop.html)[9]. The results of both of these sessions supported the May consultation. In Red Lake, community wellness and well-being emerged as primary goals. In Fort Severn, participants focused on using ICT's for achieving new standards in the delivery of governance, education and health services.

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8. The Red Lake workshop brought together local champions to learn the planning methodology and to discuss the use of ICTs in their communities.
9. Engagement in Fort Severn was focused on identifying community ICT uses and developing diagrammatic plans. The web link identified above provides an on-line FLASH animation of the workshop results.

The results of the engagement workshops triangulate the May consult and the follow-up sectoral work that was done with the education and health sectors. There was strong support for an on-line high school and the training/lifelong learning potential it proposed. There was also support for a health application that could meet diverse community wellness needs. In addition, there was broad-based support for improved local access facilities, for governance applications and for the development of digital content that reflected the linguistic and cultural practices of the region.

2.2.1 How will the project address these needs?

The demonstration project will introduce new health (an Oji-Cree Call Centre) and educational (an on-line high school) services in the five SMART First Nations. These leading edge applications will pave the way for comprehensive bandwidth rich applications (i.e. teleradiology, teleconsults, televisits) and establish new standards of access for developing collaborations and partnerships (Contact North, Lakehead University, Health Canada, Science North).

The introduction of primary applications will be supported by broadly-based technology transfer and digital literacy initiatives. These SMART services will introduce new public standards for local facilities (Community Information Technology Centres), connectivity (routing/caching), database development (Data Warehouse) and community content (Portal), and will be supported by community-based coordination, training, and production.

2.3 How will the Keewaytinook communities use ICTs to achieve their vision?

Information and communications technologies build new capacities into Keewaytinook communities. ICTs rely on the ingenuity, talents and curiosity of local watchers, users, and producers. These tools provide a practical means for achieving new standards of community-based health and education services. But they also provoke a range of broader possibilities. New media address age old limitations of human movement and memory - they support the development of tele-densities, and invite interactive expressions of indigenous experience.

No doubt, communities will adopt ICTs to achieve modest but important aims. ICT's will effectively mediate traditional barriers of space and time - barriers that, for decades, have excused standards of living that are far below the Canadian norm. These actions will encompass skills acquisition, service innovation, governance-on-line, and community-building and will be grounded in culturally-relevant standards and bases of data, open affordable access to new media, and effective management of networked resources.

2.3.1 What is new and innovative about the project?

This project adopts a systems view of community well-being and development. The Kuh-ke-nah network provides an aggregated model of demand to meet applications focused needs within a regional community of First Nations users. The project constitutes a distinctively different approach to telecommunications by bundling fully supported services within networks of networks. The Kuh-ke-nah network provides a reliable gateway for administering and delivering new generation services and is an integrated resource for implementing and sustaining distributed learning and health informatics strategies. Further, Kuh-ke-nah engages local First Nations to iteratively determine what the network will do and how it will be done in each

community. The shared network is structured by local animation and decision-making and is defined by each community's capacity to support learners who want to use the network for personal, commercial, and professional reasons. Kuh-ke-nah also encourages the development of local innovation by introducing and supporting technology tools within each community. Local networks are incubation sites where skills are honed, jobs are invented and community intelligence is brought to bear on local issues, economic challenges and cultural priorities. The sum of these networks expresses a diffusion of innovation — a synergy of new media — structured within open standards, organized by regional realities and managed by Indigenous community.

2.3.2 How will use of ICTs fundamentally change the community?

Access to ICTs will transform administrative, commercial and personal communication protocols in Keewaytinook communities. ICTs will enable direct communication with Band and institutional representatives, provide flexible and culturally appropriate access to learning and health care information, and encourage interaction with new commercial stakeholders and markets. Use of ICTs will, for the first time, introduce a common standard of high speed access. Currently, communities are characterized by a patchwork of telecom solutions. Consequently, each First Nation utilizes different standards of access and interoperability. Diffusion of ICT technologies, knowledge and skills will establish uniform system expectations among users and facilitate intra-network and inter-institutional collaboration on regional projects. Introduction of ICTs will also establish new knowledge brokers who will coordinate acquisition of new media skills, demonstration of interactive technologies, and implementation of community-based plans. Accordingly, ICTs will fundamentally change the infrastructural capacity of each First Nation to participate in Canada and with the world.

2.4 What are the access barriers that the project addresses?

Isolation is the primary access barrier. This project addresses the physical, socio-cultural, and economic dimensions of isolation.

2.4.1 How will the project address these barriers?

The Kuh-ke-nah project addresses isolation by supporting the interactive use of communication tools, processes, and services. The project will hire and train local people in three primary ICT competencies -- diffusion/coordination of innovation and training, technical maintenance and servicing, and multi-media production and design. These individuals will ensure that users in each community (individuals, workers, institutional representatives) will have face-to-face access to baseline support. Kuh-ke-nah also enhances community interaction with ICTs by providing universal access within each community. Small business people will have affordable access to a new media production and videoconferencing suites. Those who can not pay for high speed home-based services will gain access at the Community Information Technology Centre. These steps will eliminate physical isolation from ICT expertise and provide a platform for them to sharing local socio-cultural and economic solutions to community sustainability challenges.

2.4.2 How will we ensure services are affordable?

Affordability of services is factored in to the shared networking model and the transition of local services at the end of the project's third year. The network will aggregate demand across five

primary service domains — local high speed-to-the-home delivery, telehealth, distributed learning, justice, and band administration — within four networking environments: municipal area network, wide area network, virtual private network, and internet. This configuration stabilizes costs by consolidating network maintenance and management and reduces aggregate risk by diversifying and distributing revenue sources.

A broadly-based networking approach provides a way to manage cost/affordability and maintain equitable and fair access for specific sectors served by the network. This structural strategy is supplemented by a transitional agreement with the local cable service provider. In the final year of the demonstration project, Kuh-ke-nah will negotiate the transition of Community Information Technology Centre management to a local party. This party will maintain this access site in the community and provide on-going open and affordable access to persons who do not have high speed-to-the-home services..

2.5 What is your communication plan to involve people and keep them informed and how will this happen inside and outside of the community?

The communications plan integrates community information and feedback within six platforms. The first platform utilizes local political leadership to move information from communities to the project's Board of Directors. The second platform engages local information technology committees in an iterative planning and tracking cycle. The third platform utilizes the local IT Coordinator to demonstrate new technological capacity and broker training. The fourth platform interactively routes and archives questions and answers through the Kuh-ke-nah Portal. The fifth platform uses Aboriginal broadcast and print media to distribute project updates and transfer new media skills and knowledge. A sixth platform will use face-to-face and on-line conferences to share information and market products and services.

2.5.1 What is the plan to open training opportunities so people can learn how to use new services?

Successful ICT skills transfer in First Nations communities is triangulated by three baseline competencies: local technology animation and training coordination, technical maintenance and repair services, multi-media production. Kuh-ke-nah will hire and train personnel and support these competencies in each of the five communities. These fifteen local workers will utilize a train-the-trainer methodology. The Coordinator will conduct a local training needs assessment and will work with the Technical and Multi-Media support staff to develop training plans and skills modules to meet needs identified in each community. Skills manuals will be posted on the Portal and shared among community workers.

Local training will be supported by Kuh-ke-nah network staff and augmented by curriculum developed and delivered by Kuh-ke-nah institutional partners such as the Independent Learning Centre, Contact North, Confederation College and the Keewaytinook Secondary School.

2.5.2 How will you gather and integrate local feedback to improve level of service?

K-Net has a longstanding relationship with Keewaytinook communities and regularly solicits feedback as it relates to the quality and level of service in each First Nation. Kuh-Ke-Nah's partnership with the Telecommons Development Group will formalize the feedback and community engagement processes. The process will facilitate the development and iterative evaluation of local telecommunication service priorities. Workshops will be held prior to and

during the implementation phase and periodically throughout the project and will be the primary planning tool used by Kuh-ke-nah staff to adjust and improve provision of service on a community-by-community basis. First Nations community stakeholders and network partners will participate in the process of reviewing and refining local outcomes, outputs and indicators. This approach was piloted twice in November of 1999 and was enthusiastically received by community representatives.

2.6 What benchmarks will be used to assess the increase in the quality of SMART services?

Kuh-ke-nah will work with communities to establish specific performance benchmarks in each community, such as...

- E-mail penetration - numbers of members with active email accounts
- Creation of new businesses (including e-businesses).
- Development of new websites.
- Network traffic - increasing, where the access is going, types of access.
- Level of health & Education Access - from local and government sources.
- User surveys and telephone contact.
- Tracking within Results Based Management.

3.0 Smart Services

3.1.0 Describe the integrated and operational community networks currently in place.

The Kuh-ke-nah SMART First Nations are joint partners in an integrated network service called K-Net (http://knet.on.ca). The K-Net gateway provides turnkey access to primary applications and to local, regional and national information resources. Each Kuh-ke-nah community also has technical capacity for local intra-networking. This capacity will be improved and expanded as the K-Net inter-network migrates to a Kuh-ke-nah Portal WAN configuration.

3.1.1 Which type of network will be used in the SMART project?

The Kuh-ke-nah topology accommodates the development of collaborative virtual local networks. These networks will be embedded within the WAN and will share a common point of entry - the Portal. The community network will feature local events, information, and fora. It will provide a common point of entry to local electronic resources and reflect the cultural, socio-economic, and political priorities within each community.

3.2 Describe how SMART will add extra value to on-line services now available.

Current on-line services in Kuh-ke-nah SMART First Nations share characteristics such as slowness (transfer rates, upload times, output bottlenecks), limited interactivity - web services are generally one-way and substantially limited in their capacity to provide timely access to specialized bases of data. Similarly, most on-line content is culturally inappropriate and provides information that is dated and/or of limited relevance in remote First Nations settings. Primarily, on-line services are exogenous. They tend toward a lack of integration with the practical realities of everyday life and fail to logically associate related sectors, data, and/or services.

The exception is content aggregated within the K-Net interface. Although community-level data is often descriptive and static, network-wide projects such as the IYASH legends site (http://legends.knet.on.ca/) and the on-line Oji-Cree Dictionary (http://knet.on.ca/dictionary.html#dictionary) provide first generation interactivity and meet regional demand for culturally vital and regenerative sources of information.

The Kuh-ke-nah Portal adds value to current services by introducing community-wide standards for developing new products and regional standards for creating and enhancing web-based services. Wide area network services will guide the development of new content projects, support the creation of unique resources, and be a primary tool in the animation of digital literacies and diffusion of multi-media skills within each community.

On a technical level, the caching / router project adds tremendous local value to on-line services by designing a specialized solution to the information management needs in small and remote communities and local businesses. The Caching / router project will see the development and deployment of a system that increases the value of scarce internet resources and improves the cost effectiveness of information distribution in local area network environments.

The Community Information Technology Centres (CITC) provide a local hub for diffusing new ICT skills and knowledge. They will provide a site for demonstrating the ways that networks can be used to create, manage and store information. The CITC will enable micro business

incubation by passively supporting entrepreneurial interest and by actively engaging economic development initiatives in each community. Accordingly, the CITC adds value to the current on-line environment by providing first hand, affordable access to a range of technological choices.

The CITC's also triangulate three important values in information societies; the capacity to coordinate and facilitate skills acquisition and retention; the ability to diagnose, repair and maintain local information distribution systems; and the capacity to create and update innovative interactive new media. These jobs will constitute a core resource for individuals, businesses, and institutions who adopt ICTs and provide a personal bridge between information technologies and the human uses to which they can be applied.

The Data Warehouse Initiative addresses specific issues related to community and personal information and intellectual property. The consultative protocol that it follows will animate the development of guidelines for defining, using, storing, transferring and retrieving data. It also establishes a dialogue on behalf of traditional knowledge holders and addresses how their intellectual properties will be secured within newly digitized domains. The standards will serve to enhance the on-line value of data resources by ensuring a measure of reliability and accountability and by encouraging specific data warehousing projects and partnerships.

Kuh-ke-nah SMART services will add value to local knowledge and use of on-line resources by employing and training people in each community. Kuh-ke-nah will demonstrate that information economies not only create and support new types of work, but that these jobs and services can be distributed among otherwise remote populations. The Community Information Technology Centre will house three new community workers, the Call Centre will utilize the skills of individuals in all Keewaytinook communities and the introduction of next generation health, education, and policing applications will stimulate demand for new information workers in each First Nation.

Much of the value associated with SMART services relates to the enhancement of what most Canadians think of as standard health and educational services. During the term of the project, people living in Keewaytinook communities will have new educational and health choices. Youth will have increased access to educational chances through the creation of Keewaytinook's On-line Secondary School. These SMART services also add value by basing distributed Health Information Service delivery in Keewaytinook communities. Both the educational and health initiatives lay the groundwork for services to follow - through an electronic gateway that enables access to post-secondary offerings and lifelong learning opportunities and from an infrastructure that enables telemedicine and tele-consultative protocols.

3.3 What are the SMART services proposed?

Kuh-ke-nah has worked with its community partners to develop six SMART services. These services broadly reflect community demand for increased choices. They make on-line secondary education available for the first time and improve access to health care information. The projects aim to enhance local capacity to learn about new media tools and apply multi-media techniques. The projects also create a process for determining how information is collected, sorted, stored and retrieved and for strategically directing the development of bases of data that serve specific community interests. Finally, these projects are grounded in the development of a local

technology centre. This place is both a hub and an edge. It centralizes network services and makes a concrete contribution to community-based innovation in the use of ICTs. These services are bundled around a concomitant deployment of broadband network capacity. The six SMART services are: the Keewaytinook On-line Secondary School; the Distributed Health Information Call Centre; the Kuh-Ke-Nah Portal; the Data Warehouse; the Caching / Router project; and the Community Information Technology Centres (see 3.6.1 to 3.6.6).

3.3.1 To what degree are they innovative, interactive, and international in scope?

Service innovation lies in three domains. The Keewaytinook On-line Secondary School and the Distributed Health Information Call Centre use ICTs to introduce new levels of service (being able to go to high school without having to fly out and having access to culturally relevant health information). Both projects will introduce new standards between First Nations people and health and education professionals and both propose models for transfer to similar settings in Canada. The Secondary School and Call Centre projects address longstanding community needs for improvements in life chances and choices within a managed network environment.

The Kuh-ke-nah Portal, the Caching Project and the Data Warehouse initiative actively engage communities in determining their data environment. These services emplace communities by highlighting community ownership of their digital landscape. Each project proposes to use ICTs to develop content that has a direct administrative and creative relevance to the cultural, linguistic, and geophysical practices that constitute day-to-day life. The caching project aims to develop a highly efficient algorithm to track web-based traffic patterns and provide enhanced storage and retrieval capacities for small and isolated communities. This product has wide market application in Canada, the United States and in Latin America.

The Data Warehouse proposes a process to interactively determine data standards and definitions and brokers a new level of integration between bases of data and their local utility and value. The goals of the project are to establish common methods and formats for reporting and sharing First Nations information and to incubate regional database projects e.g. interactive traditional land use mapping, emergency preparedness, oral historical records in each Keewaytinook community. The standards and products that result from this project will likely be useful in other First Nations contexts.

The Portal provides a shared medium for these and other content products. It constructs local networks of interest activities, decisions, forms of expression that animate internal dialogue and engage external transactions. The Portal provides a shell for delivering near instantaneous local and regional web access and a common platform for distributing and gathering governance, e-commerce, and cultural information.

The Community Information Technology Centres (CITC) will be a visible and active expression of changes in the local ICT environment. The CITC will be an integrated ICT hub that houses Portal content development, provides affordable internet access, and provides regular and on-going animation and training in the use of standard and emergent technologies. The CITC will also function as a demonstration site where new technologies and/or applications can be observed and evaluated by different groups in each community. The Kuh-ke-nah partnership model with each community will provide valuable information for sustaining similar Centres in rural and remote Canada.

3.3.2 How will personal information be safeguarded?

The Data Warehouse Project (see 3.6.2) will introduce a consultative protocol among community leaders and institutional service providers that will consensually establish data standards and definitions. The Warehouse project will highlight the development of policies and standards for the storage and retrieval of personal information.

Data collected for SMART surveys, evaluations or pilot projects will not be cross-tabulated or otherwise grouped except at the regional level. Community level data will be aggregate/descriptive only. Persons involved in these projects will only be identified if they choose to waive their right to confidentiality and there is a demonstrable benefit to including this level of detail.

3.3.3 What level of accountability will be provided to the community?

The Kuh-ke-nah SMART project is governed by the Keewaytinook Okimakanak Chief's Council. These Chiefs are directly accountable to their communities (see Project Management Diagram 5.4). At the community level, the project will establish a local Information Technology Committee (ITC). These Committees will be local sounding boards during project implementation and will identify local priorities, plan activities, and dynamically assess local needs that ICTs are addressing. The ITC will be supported by a full-time paid coordinator (who will also act as facilitator for the Community Information Technology Centre). Each local ITC reports directly to the Band Council. The concerns of Council will be channeled directly to the project Board through their respective Chiefs.

The project design links community engagement with a results-based accountability structure. Kuh-ke-nah has adopted a recursive planning model that empowers local people to map their priorities and to dynamically adopt new solutions. This model will be introduced initially at community engagement workshops (this process was successfully delivered at regional and local planning workshops in Red Lake and Fort Severn in November 1999, see 2.3).

Local CITC Coordinators will be trained to facilitate local planning and to coordinate feedback from communities. The Evaluation Team will provide on-going community workshops and briefings during the evolution of the project and at key points where project processes require active stakeholder participation and endorsement of project Activities and Outputs.

3.4 Describe your plan to build a critical mass of users to pull demand for SMART services?

The project will diffuse ICT-based innovations by highlighting pragmatic expectations and baseline needs in Keewaytinook Okimakanak communities. The Project will:

- engage local champions in planning and adopting ICTs through local Information Technology Committees;
- renovate/construct a local Information Technology Centre to provide formal and informal IT and basic applications training, ensure affordable local access to the internet, and demonstrate bandwidth-rich applications;
- hire and train local people to fill critical positions in each community: Centre Coordinator and Facilitation, Multi-Media (local) Content Producer, Local Network Technician;

- work with a local business or Economic Development Corporation to deliver high speed internet access to the home via the local cable plant
- provide local coverage with VPN-ready technologies (health, policing, education, and local governance;
- collaborate with Aboriginal partners to provide value-added cultural services and open opportunities for telework;
- work with the technology sector to ensure the installation and timely deployment of reliable and effective information systems and technologies;
- develop new partnerships to meet emergent community uses of ICTs;
- demonstrate new educational and health applications in all communities; and,
- encourage the development of new information-based businesses, services, and applications.

Kuh-ke-Nah's capacity to respond to community-based interests and priorities will provide a practical context for achieving a critical mass of users particularly among key demographic segments within First Nations.

3.4.1 What market penetration do you expect locally, regionally, nationally, and globally?

SMART services such as the Kuh-ke-nah Portal, the Keewaytinook On-line Secondary School, and the Distributed Health Information Call Centre will be universally available in the local and sub-regional market. Data Warehouse activities will include national agencies, institutions, and markets. The Caching and CITC projects will have global reach and address a niche market.

3.5 What measures will you incorporate to ensure transferability to other Canadian communities?

All of the proposed SMART services are built on open standards, reflect pragmatic - close to the ground - design and are needs driven. Products developed from the caching project will be small, lightweight and easy to use. They will find application in First Nations communities, rural and remote community networks, and internationally in developing world contexts and business environments.

The Portal will provide a template for similar content initiatives in North American First Nations. Similarly, the Data Warehouse project will generate standards and definitions that will facilitate EDI-type governance and learning resource projects across Canada. The On-line High School and the Call Centre Services each propose wider application in regional and inter-provincial contexts. CITC development likely will transfer first among First Nations in the Nishnawbe-Aski Nation. Data products will be delivered on international platforms. All web interface will use current generation HTML/Java scripting.

3.6 SMART Services

The Kuh-ke-nah SMART demonstration project is built on the delivery of services and the development of products that reflect the needs of Keewaytinook communities. These SMART services are designed to achieve Results identified by local stakeholders; are bundled within a broadband network development framework; and are animated, maintained and reinforced through trained local staff and public access facilities.

3.6.1 Kuh-ke-nah Portal

Portals organize worlds of information. They provide customized access to specific data and they are very fast for people who are on the intra-network (internal network environment) that the portal operates in. The Kuh-Ke-Nah portal will provide high speed access to community information and services. The portal will allow communities to control access to information based on community standards of acceptable and appropriate use. It will provide a place to observe and participate in the ICT developments that Kuh-ke-nah introduces.

The Portal will be coordinated by a Regional Animator. The Animator will implement a quality assurance protocol that, in part, will ensure that all applications are based on open and international standards and will coordinate collaborative Web-projects such as the Saskatchewan E-Commerce Pilot. The Animator will also identify and hire local multi-media producers and facilitate local training activities.

Producers will learn how to design community-based content projects using integrated software suites such as MacroMedia and PhotoShop/Illustrator. They will also learn how to work with local people at the Community Information Technology Centre to transfer and support multi-media skills development and to develop web pages, e-commerce sites, and focused search facilities for individuals, businesses, and organizations.

Project Outputs include:

- **Web Interface** - personalized web access and e-mail, Networked Community Radio streamed, multi-cast audio of what's on the radio in each community, a Youth Recreation Website with information about youth sports and cultural activities, a Digital Art and Crafts Gallery, a Community Announcements Board, and Dynamic Digital Literacy Support.
- **Community Development Tools** - data interchange demonstrations and user support for small businesses, and local government administrators (data transfer, inventory control) and web presence for use of e-commerce (marketing, e-mail, and on-line bidding) services.
- **Government On-line** - support for use of on-line communication tools to guide community and regional plans, land use planning and emergency preparedness planning, and development of single window services for Band members; to facilitate access to provincial and national government sites and services and to disseminate local and regional records of decision such as hyperlinked Band Council Minutes and audio streaming for Regional Chief's meetings.

3.6.2 Data Warehouse Initiative

The introduction of SMART resources anticipates important changes in the volume and accessibility of personal, social, economic and cultural information. The storage and retrieval of this data supposes measures for safeguarding personal privacy and suggests significant opportunities for using this data to track the development and delivery of services and improve system-wide accountability. This scenario was highlighted by the Royal Commission on Aboriginal Peoples. In their *Final Report* Commissioners advocated for the development of electronic clearinghouses that would address issues identified above and build First Nations capacity to construct bases of data that reliably reflected Aboriginal experience.

The Data Warehouse project proceeds in two stages. The first stage is concerned with developing and agreeing on policy and standards and the second stage is the facilitation of local and regional database projects. Each First Nation will have its own warehouse for interrogation and trend analysis. Local data warehouses will be fed from the First Nations' own operating systems and will be under control of each First Nation. Periodic extracts of the local warehouses will be sent to a central network warehouse to enable system-wide summaries and reporting. Benefits of this project include:

- Better decision support within First Nations since Management Information from diverse local operational systems are stored in a central and uniform warehouse.
- Improved accountability for First Nations and the Keewaytinook Council, because the warehouses could integrate and produce key community-based indicators.
- An ability for cooperative groups of First Nations sectors to pursue a common research interest and perform specific analytical work.
- Development and on-line delivery of thematic database resources.
- Decreased effort required to comply with internal/external reporting requirements.
- Comparable, reliable and timely information for First Nations.

Stage 1 Outputs
- The creation of a standard data warehouse to meet accountability and information mandates.
- Agreement on data standards and definitions.
- Development of policies on the sharing, use, and storage of personal and aggregate information by First Nations and its government partners.

Stage II Outputs
- Identification and incubation of local database projects.
- Development to prototype of one online database in each community
- Agreement on and joint development of one regional database project (Land Use and Resources, Emergency Preparedness, Traditional Knowledge)
- Cooperative development and resource sharing with the Oji-Cree Health Knowledge Database (see 3.6.3)

3.6.3 Distributed Health Call Centre

The Kuh-ke-nah network provides an opportunity to support the development of an integrated IP environment for dynamic (data/voice) health information delivery. The purpose of this SMART service is to improve the level and quality of home care services in Keewaytinook Okimakanak communities by introducing new health information and referral services.

The Call Centre project meets immediate community needs for homecare services and permits the phased integration of familiar (telephone) and new (database) technologies. On-going operational costs will be structured by Health Canada's Medical Services Branch and provincial health services agreements.

This project provides an important first step for health consumers and health professionals by raising local awareness about the ways that practices and protocols will relate to knowledge intensive health applications, such as telemedicine, and increasingly sophisticated tele-diagnostic procedures such as cardiology and radiology.

This project will also address longstanding cultural barriers to health information by supporting the development of an on-line health knowledge base that will be translated in to Cree and Ojibway. This database will be introduced on the Kuh-ke-nah Portal and likely will find acceptance in other First Nations who share Ojibway and Cree languages.[10]

Project Partner

Kenora-Rainy River Community Care Access Centre (see Letter of Commitment)

Result

- Meet the immediate need for improved access to homecare services in First Nations and delivery of culturally appropriate and timely health promotion information

Outcome

- Successfully introduce distributed access to health information
- Provide community-based employment for First Nations people
- Demonstrate the viability of distributed health applications

Outputs

- Case Management/home care services, and information and referral services (end of year 1)
- Shared development of a community-based First Nations Call Centre (beginning of year 2)
- Development and distribution of an on-line health information knowledge base in Ojibway and Cree languages -- syllabics and roman orthography (end of year 3).

[10] Statistics Canada's 1991, Aboriginal People's Survey, identifies Cree and Ojibway as the two predominant indigenous languages in Canada.

3.6.4 Keewaytinook On-line High School

As education under local authorities has stabilized, a larger percentage of local children are graduating from grade 8 at a younger age. More students now wish to enter a secondary school program which is not currently available to them in their home communities. At this time, they must leave home to acquire secondary school training. Kuh-ke-nah will address this community need by supporting the development of an on-line high school. On-going operational costs will be provided by Indian Affairs nominal roll funding.

Students and parents alike indicate the desire for choices on how and where they will acquire their secondary school education. Teens should have the same option that is available to their southern counterparts. They should be able to continue their education at home if they so choose, and attend school in an urban setting when they and their families agree that they are ready.

Secondary school is being offered via the Internet in other parts of Ontario and in other Canadian provinces. Programs tend to cater to the learner needs of the specific geographical area being served. It is therefore known and acknowledged that programs offered via CMC are successful and can provide an educational foundation equivalent to that of a face-to-face classroom for adolescent learners. The purpose of the pilot project is to:

- develop a meaningful, cost effective program delivery process;
- monitor processes and usage of technology to ensure an effective delivery system for learners and teachers including:
  - developing appropriate curriculum for distributed delivery
  - installing and testing computer and equipment needs;
  - monitoring effectiveness of technological enhancements
  - confirming required K-Net Services and community technician needs;
  - strengthening computer access skills for learners;
  - identifying and addressing teacher training needs for effective program delivery;
- evaluate the success of the program and identify required changes.

Major Implementation Activities[11]

PHASE	TIME FRAME	ACTIVITY
Start Up Phase	Oct. 99 - March 2000	Pre-implementation, Planning & Promotion
Pilot Project	April. - June, 2000	Gr. 8 Native Studies Unit
Year 1	Sept. 2000 - June 2001	Grade 9
Year 2	Sept. 2001 - June 2002	Grade 9 & 10 dependent upon Evaluation and community desire

[11] Project implementation uses academic calendar years.

3.6.5 Community Information Technology Centres

The Kuh-Ke-Nah Network will connect with each community at a new Information Technology Centre. The centre will be a hub that will provide direct access services on the Kuh-Ke-Nah high speed network. It will house a seven station community computer access and training site, a videoconference suite, workstations for disabled users and for multi-media production, a network equipment room, and office space for three Kuh-ke-nah staff. CITC facilities will be renovated and leased by the communities. In Year two a model CITC will be constructed in one of the communities. Transfer of the CITC at the end of year three will be negotiated with a local business or economic development corporation.

Community Engagement and Marketing

The Information Technology Centre is a point-of-presence. A full range of network services will be demonstrated and marketed in the Centre. Individuals, Committees, and businesses will be invited to participate in technology application sessions. Here, they will see how the service works and provide feedback.

The Coordinator will organize all training (introductory, multi-media, technical) and deliver hands-on introductory sessions. Introductory workshops will focus on use of internet technologies - basic applications like e-mail - and computer applications. These public sessions will be augmented by focused technology transfer workshops with community partners - teachers, health professionals, police, and Band employees.

The Centre Coordinator will also lead, organize and animate a local Information Technology Committee and make regular reports to local Chiefs and Councils. The engagement function is a key factor in the development, evaluation and evolution of SMART services during and following the term of the demonstration project.

Technical Services

The CITC is the distribution point for network access in each First Nation. The Network equipment room will double as the office for the network technician. Local network technicians will maintain the router / hub / UBRs and will provide technical training, assist local clients with computer needs, office LANS, and help consumers install cable modems and network cards in to their home computers.

E-Business Incubation

The CITC supports the development of local businesses primarily as an incubation site for products and services that will be marketed and sold using electronic commerce. The CITC will also provide business people with access to lifelong learning activities, and support people exploring telework options in the community.

3.6.6 Caching Project

The aim of this SMART service is to research, evaluate, and market a caching solution that will meet the needs of small schools and community access sites that are remote and or isolated. These sites are characterized by high user demand coupled with a high latency, low bandwidth connection such as the SchoolNet MSAT/DirecPC program or those with DirecPC and dial-up access. In Canada, there are approximately 400 sites that would immediately benefit from this technology. Hughes also licences the DirecPC protocol world wide. Accordingly, this solution will find broader global application as internet accessibility is diffused in the developing world.

Opportunities for Development

The current technologies present several opportunities for new product development in this area:

- the caching method is not remotely programmable or dynamically updated from a central caching server.
- caching logs cannot be sent to a shared location for evaluation by a system administrator.
- there is heavy disk fragmentation due to the Windows Operating environment.
- administrators can not remotely log in and work on the caching software.
- Proprietary standards (Windows/Wingate) do not permit modification or improvement without significant time and money investments.

A Kuh-ke-nah Solution

Kuh-ke-nah is addressing these challenges with the aim of developing an affordable caching/router solution for satellite-based internet access sites. The major steps are:

1. Adopting an open code software environment. Preliminary analysis with Linux demonstrates its capacity to address cost, disk fragmentation and source code issues.
2. Integration with K-Net router technology - a rugged, field tested router that has no moving parts and runs entirely in RAM. The router boots from CDs or FlashDrives. Eleven routers were ordered in December for installation in remote sites in Ontario and British Columbia.

Project Objectives

The proposed solution requires benchmark testing under field conditions. The final product will reliably demonstrate:

- open standards; interoperability with high latency, low bandwidth links that use hybrid gateways such as the Express-vu DirecPC product;. utilize live and policy based caching techniques; is a form of intelligent caching.

Product testing will occur in Keewaytinook communities during year one of the demonstration project. The Education Network of Ontario has made a partnership commitment to the project. Product marketing will highlight development conditions and its potential for SMART application in national and international contexts. Follow-up research and testing will determine if the router/caching product can effectively accommodate primary and secondary caching.

4.0 SMART Infrastructure

4.1 Describe current local access to interactive media at home, at work, and at PACs.

At Home:

Home-based access includes off-air distribution of satellite-delivered broadcast radio and television services. Community Aboriginal services include Wawatay network television and radio, Wahsa Distance Education High School broadcasts, and local community radio. TVOntario also distributes its service locally with some special interactive call in programming.

Currently, residential phone service is available in Fort Severn, Poplar Hill, and Deer Lake. Infrastructural improvements to the Bell Canada backbone were completed in September 1999. This digital upgrade permits extension of POTS to North Spirit Lake and Keewaywin. Residential service will be introduced in North Spirit Lake by April 2000. Keewaywin dial-up is scheduled for completion in November 2000.

Officially, there is no home-based internet access in Keewaytinook Okimakanak communities. Unofficially, Keewaywin began to wire its community this summer when Stan McKay, the local Community Access technician, connected his computer at home to the server hub at the Band office. It worked! Now there are ten homes in the community who have network lines running to and from the server room the longest connection is about 130 metres.

People such as Chief Maggie Chisel who are connected at home use e-mail and internet messaging to exchange information with each other, with people using the Access Centre in the Band Office and with the school computer classes. The Keewaywin network of home-based users is a temporary local infrastructure that provides an innovative networked solution for a community without phones.

In Deer Lake and Fort Severn, the local economic development corporations have wired communities for cable service. Both communities manage viable cable distribution systems. Deer Lake also provides a community-based information access service (Community Messages and Tele-visiting).

At Work

Each community routes in-bound network traffic through a DirecPC downlink and routes outbound traffic through two 4.8 kbps MSAT modems (for a maximum output of 9.6kbps). This traffic is aggregated within a 1.5Mbps wireless local area network. The major institutions are connected to the LAN-clinic, band office, policing, and school. Each workplace has between one and twenty five network workstations. Other departments such as Public Works, Economic Development, Northern Store and small businesses are not networked. Email is used extensively for communications and for transferring of files. The ICQ network is used by North Spirit Lake and Keewaywin as a temporary means of communications due to lack of telephones.

At the Public Access Centre

Each community maintains a public access centre. These centres are located in a variety of locations in each First Nation. The Band office and Nursing Station each have at least one computer available for public use and the schools provide a computer lab for public access during out-of-school time.

4.1.1 How will you integrate this on-line access into the project?

The project sees local on-line access integrating at three levels.

1. Home-based users will have the option to buy high speed service from their local cable company.
2. Small businesses, agencies and departments will have the same purchase option and will be able purchase occasional use of videoconferencing services from the Community Information Technology Centre.
3. Persons who can't afford home-based access will be able to use internet and computing resources at the CITC. These environments will be open on a regular basis, be staffed by trained personnel (Coordinator, technician, multi-media producer), will have the capacity to produce multi-media on-line content for local groups and businesses and will accommodate unique physical needs of users. Accordingly, the CITC will integrate ITCs and provide focused training for users.

Currently, e-mail is the most popular application among people living in northern communities. As of January 12th, 800 active e-mail accounts were registered by people living in Poplar Hill, Fort Severn, Keewaywin, Deer Lake, and North Spirit Lake[12] or 32% of the total population. This compares to a total registered population of 2,489 in these communities [13]

Community	Population	Active E-mail Accounts
Deer Lake	850	233
Fort Severn	470	165
Keewaywin	539	154
North Spirit Lake	314	164
Poplar Hill	316	88

4.2 What is Kuh-ke-nah's plan to ensure collaborative extension of enhanced infrastructure with carriers?

Keewaytinook Okimakanak staff are working with the Communication Research Centre, Bell Canada, Cisco, Adcom, Lakehead University and Telesat Canada as a partners in the planning and development of the network. Decisions on design and growth are made in consensus among the parties. Cisco is providing a system engineer for all parties to use as the network is developed.

The Communications Research Centre reviewed the network from a technical and needs perspective and its endorsed its viability. Further, Bell Canada has indicated that the Kuh-ke-nah

[12] K-Net has 4,023 registered e-mail accounts and logs an average of over 11,200 hits per day on its website.
[13] The most recent statistics are from Indian Affairs and Northern Development website, December, 1998.

network's secure design and VPN architecture might provide an alternative data service corridor in marginal service areas.

Bell Canada and Telesat Canada are the only carriers who provide switched telecom services to Keewaytinook Okimakanak First Nations. Kuh-ke-nah managers will work with these carriers to ensure timely delivery of broadband network capacities by month six of the project. Broadband presence will interconnect from the Community Information Technology Centre to the Band Office, the Constabulary, the Elementary school, and the Clinic.

Kuh-ke-nah will also work intensively with local development corporations and the regional private-sector cable supplier to plan the installation of cable-based internet to the home services, to upgrade existing cable systems for internet delivery, and to interconnect local cable distribution systems to universal broadband routing hardware in each community. New data systems over broadband coaxial cable will be installed in Poplar Hill, North Spirit Lake and Keewaywin First Nations. Data capabilities will be added to video-based systems in Deer Lake and Fort Severn.

Delivery of high speed internet access to the home is scheduled for the final quarter of year one. In years two and three, Kuh-ke-nah will work with local cable companies and routing technology providers to introduce enhancements within the cable environment, such as voice over IP, and virtual private networking capacities.

Kuh-ke-nah's infrastructural goal is to install the broadband network and enable network services in the project's first year. Enhancements to network services will likely occur as new carriers and service providers enter this market. Kuh-ke-nah will monitor development plans of other common carriers and regional networks, such as BC-Telus, AT&T, LUNet and the 807-Northwest Network, and assess how enhanced bandwidth, discounted pricing structures, and/or advanced service solutions could extend community network value.

Kuh-ke-nah will assess network demand and traffic throughout the project. This data will be shared with Bell Canada and other carriers to identify service improvement options over the recently upgraded digital plant. Extension of network services will also be evaluated throughout the project. Marketing and partnership negotiations with adjacent First Nations will allow for network expansion and service enhancement.

4.3 How will the project significantly increase the percentage of classrooms, businesses, government agencies (in the community), libraries, and other organizations connected to the Internet, and/or increase their level of Internet use, and/or the quality of connections?

Due to the low bandwidth and high latency of the present system it is difficult to do much in the way of sending out information in volume from the community. The addition of high bandwidth and low latency access to all the buildings in the community will increase the data transfer rates out of the communities by a factor of 100. The availability of a wider range of services including Data, Video and Audio will make the broadband access an integral part of the communications process as opposed to an occasional one that is fraught with delays and lost packets.

The Kuh-ke-nah network will establish a pubic point of broadband access - the Community Information Technology Centre - and distribute bandwidth from this hub. Network services will be extended to the four primary institutional presences in each community. The Cisco 3662 will manage traffic between the external CSU/DSU and the internal CSU/DSU and corresponding Cisco 2621 edge router. Other businesses and departments will be able to interconnect through the cable distribution system.

The network will deliver dedicated T-1 bandwidth to each community. Kuh-ke-nah intra-networking/caching will guarantee near T-1 to the desktop. Accordingly, network implementation will provide broadly-based access and increase the efficiency and effectiveness for users on the network.

4.4 How does the broadband implementation plan ensure that the enhanced technology infrastructure builds on current infrastructure and will be in-place for successful operation of SMART services?

The proposed design was selected from options identified in the 1999 FedNor funded Broadband Study. Suggestions by engineering staff at Bell Canada and Telesat Canada have been incorporated to ensure reliable integration with each carrier's physical plant. Additionally, Kuk-ke-nuh's network plan has been favourably reviewed by the Communication Research Centre's Director of Business Development. Dr. Tsang concludes that the:

"Proposed network would help to realise a wide range of synergies... We feel that this aggregation of users will enable the planned network to be economically sustainable."

Some of the existing data networking infrastructure will be redeployed. MSAT data throughput units will be returned to FedNor for use in other remote communities. Wireless networking technologies will be redeployed to facilities such as airports or public works facilities that lay beyond the reach of the local cable distribution system.

4.4.1 Provide a three year timeline for network implementation.[14]

Action	Yr1	Yr2	Yr3
Network Implementation			
Review/Update Technology Plan	1stQ	1stQ	1stQ
Identify local candidates for technical positions	1stQ		
Order capacity from carrier	1stQ		
Order wire for community cable installation	1stQ		
Begin local network technician training	2ndQ		
Deploy construction crew to being wireline installation	2ndQ		
Order routers, CSUs/DSUs, UBRs	1stQ		
Order videoconferencing equipment	1stQ		
Core Technician Training (Routers/H.323 conferencing)	1stQ		
Setup routing and network management systems and pretest	2ndQ		
Bandwidth segment testing	2ndQ		
Deploy regional hub routers in Sioux Lookout and Red Lake	2ndQ		
Coordinated router/local loop installation with Bell Canada	2ndQ		

[14] See attached Network Diagram (Appendix D)

Installation of local ICTs	2ndQ		
Community-based segment (T1) testing	2ndQ		
Hook-up local LANs and test	2ndQ		
Light up network and system by system troubleshoot	2ndQ		
Coordinate installation/upgrade/testing of data cable with 3rd party	4thQ		
Technician training period ends		2ndQ	
Work with network clients to set up VPNs and enhanced services	4thQ		
Review network traffic patterns/identify need for increased capacity		4thQ	
Maintenance and Upgrade Review			2ndQ

5.0 Organization

5.1 Provide a brief and concise organizational history

K-Net has provided integrated distributed systems services and support since 1995. A listing of all K-Net projects is available at: http://knet.on.ca/services/index.html. Major projects areas include: delivering computer/IT training and support services, provision of First Nations SchoolNet Northern Ontario Helpdesk Services, coordinating/animating community access site development, operation and maintenance, coordinating/organizing regional First Nation telecom infrastructure development and improvement initiatives, coordinating youth science and technology camps.

K-Net began in the Spring of 1994 when the Keewaytinook Okimakanak First Nation Chiefs and Education Coordinators directed their staff to develop a computer bulletin board service (BBS). The K-Net BBS was designed as a "Stay-in-school" project that would connect students from Keewaytinook Okimakanak First Nations via computer mediated communication (CMC). The BBS supported student networking; encouraged peer support; introduced new computer literacies, and; gave parents a way to keep in touch with their children while they attended school away from home. Interest and support from regional First Nation groups made K-Net a truly regional service in 1995.

Partnerships with Indian and Northern Affairs, Industry Canada's First Nations SchoolNet, and the Sioux Lookout Aboriginal Area Management Board supported the horizontal integration of K-Net network planning, community support, and technical training services. By 1996 K-Net was providing on-line and phone support to First Nations schools across Northern Ontario (60+ sites); coordinating regional negotiations with Bell Canada and Telesat Canada for improved infrastructure, and training community-based First Nations computer technicians.

In 1997 K-Net moved to a web-based NT platform. The web-based environment added a graphical dimension that permitted syllabics, local images, improved chat functionality and turnkey e-mail services.[15] The success of the K-Net portal http://knet.on.ca and positive results[16] from educational/information technology projects had begun to attract new partners.

The 1997 publication of the *Final Report* of the Royal Commission on Aboriginal People (RCAP) and the subsequent creation of an Aboriginal Healing Foundation provided a context for the development of a broadly-based wellness strategy for Keewaytinook Okimakanak First Nations. The Chiefs highlighted the use of information and communication technologies (ICTs) as a major component of this strategy and reinforced the use of technology in "maintaining and protecting the Native Language in their First Nations".

During the past three years K-Net worked with Bell Canada and FedNor to initiate and coordinate regional telecommunications improvement projects such as the North of Red Lake Digital Radio Upgrade, the Satellite Served First Nations Upgrade, the Deer Lake and Poplar Hill Telecommunication Digital Data Service Upgrade, the North Spirit Lake Telecom Service Development, and the Keewaywin Telecom Service Development. K-Net has also worked with

[15] There were virtually no e-mail accounts within the Nishnawbe-Aski Nation in 1995. Today, slightly more than 32 percent of the population in Keewaytinook Okimakanak communities maintain an active e-mail account through the K-Net domain.

[16] Results documentation is available at http://knet.on.ca/new.html.

the Government Telecommunications and Information Service, First Nations SchoolNet, and the Community Access Program to develop wireless connectivity infrastructure for 24 remote First Nations. This connectivity system is now being emulated in British Columbia and Quebec.

Projects using K-Net's computer communications and services are funded in partnership with various federal and provincial agencies *Industry Canada* -- First Nations' SchoolNet Program, Youth Employment Program, FedNor, CAP -- *INAC* (Indian Studies Support Program, Science and Technology Camp, Special Projects, Electronic Data Interchange, *HRDC* -- Local Labour Market Partnerships, *Health Canada* -- Telepsychiatry pilot, Summer Employment, *SLAAMB* -- District-wide Initiatives, General Projects, Employment Insurance projects, Youth employment projects, *Ministry of Education and Training* -- Aboriginal Education Program, *Ministry of Health* (Aboriginal Healing and Wellness Program and the *Ontario Arts Council.*

These initiatives are also supported by partnerships with First Nations tribal organizations (IFNA, Matawa, Mushkegowuk, Shibogama, Wabun and Windigo), service delivery agencies such as Wawatay Native Communiations Society, Northern Nishnawbe Education Council, and the Nishnawbe-Aski Nation, and private and public sector entitities -- Bell Canada, Telesat, Cisco, Adcom, Lakehead University, Confederation College and the Education Network of Ontario.

5.1.1 Describe how Kuh-ke-nah will successfully implement the project (see activity matrix).

K-Net's work is predicated on sustainable partnerships for community development. These partnerships enable key technical and institutional infastructural changes and have produced a critical mass of individuals in communities who are driving system-wide transformations. These initiatives have been community-driven and guided by results-based management.

Results Based Management guides project managers in making adjustments to continuously revise and adapt project activities in order to stay focused on achieving results. A project will thus take an iterative approach and respond appropriately in order to adapt to the context and achieve results, rather than working with a fixed plan of action that may be "off target" as the project progresses.

An RBM approach means using feedback mechanisms to guide the process of project development. Feedback mechanisms must attend to the complex dynamics of project implementation, including human elements, political aspects, technical requirements, and time dependent variables. Community engagement processes enable community members to involve themselves in project activities. When combined with RBM, these community engagement processes enable community members to actively partake in monitoring project outputs and outcomes, and providing feedback, so that the project is able to achieve the project results that they have helped to define. Results based management planning involves the use of a "Results Chain":

Project Activities ---> Output ---> Outcome ---> Result...

where:

- A Result is a lasting and beneficial change desired by the project stakeholders
- An Outcome is a short-term effect of the project where the stakeholders take ownership of the project and external funding comes to an end
- An Output is the immediate, visible, concrete and tangible consequence of project activities.

5.2 How will the Kuh-ke-nah's track record in private/public partnerships ensure successful project implementation?

Keewaytinook Okimakanak staff are working in partnership with a number of native organizations, businesses and government programs to construct and operate the Kuh-ke-nah network. The variety of proposed applications that will ensure the network's successful implementation and sustainability are highlighted in the wealth of support received for this project from across the country. Financially, the letter from FedNor clearly documents this agency's commitment to the network having "invested $2.2 million over the past 2 years through Keewaytinook Okimakanak in telecommunications improvements .... [and] give these initiatives serious consideration". The provincial Northern Ontario Heritage Fund provided support funding to Keewaytinook Okimakanak to move to Stage 2 of their funding process to access their telecommunication infrastructure program. Bell Canada is investing over $7 million dollars to deliver broadband services into Keewaytinook Okimakanak First Nations and estimates they will have to make "ongoing investments relating to maintenance and sustainability of the Kuh-ke-nah Network of approximately $2.26 million annually" (see Bell Canada's letter of commitment). The commitments and needs as highlighted in the Band Council resolutions from each First Nation ensures local success as the project is implemented.

Effective partnerships require strong communication links to ensure healthy relationships and continued involvement and commitment to the project. A continuous feedback loop using on-line resources (e-mail, listserves, meetings, etc) and involving all the different sectors will support and encourage everyone's input to ensuring project success. The number of letters documenting staff in-kind commitment to the implementation of this project from all sectors will ensure a wide cross-section of direct involvement in the development of successful applications.

The present Keewaytinook Okimakanak wide area network is a result of partnerships with FedNor, INAC, HRDC, GTIS, Schoolnet, ENO and the First Nations (see http://knet.on.ca/manley/story1.html). The research and development information has been shared with FedNor and other First Nation Councils. Two other councils have emulated the K-Net WAN as part of their infrastructure.

5.3 Describe the Kuh-Ke-Nah management team (one page CV's attached Appendix B).

The Project Management Team will consist of Brian Beaton (Project Leader), Penny Carpenter (Project Finance), Darlene Rae (Community Liaison and Special Projects), Dan Pellerin (Network Coordination and Management) and Dawn Carpenter (Marketing and Sustainability).

The Kuh-ke-Nah Network will be governed by the Keewaytinook Chiefs' Council. The K-Net Project Management Team will direct day-to-day operations. A volunteer Project Advisory Group comprised of sector representatives will provide strategic advice to the Project Management Team.

5.3.1 Describe the role of each leader/champion on the management team. (See Appendix C for more detail)

Brian Beaton is the Manager of K-Net Services and will oversee all aspects of the project. Penny Carpenter is Keewaytinook Okimakanak's Financial Advisor who will work closely with the Project Leader to develop and maintain financial and accountability controls for the project. Darlene Rae is the Manager of K-Net Programs; Darlene will ensure that community-based workers are engaged, trained, and supported and she will coordinate community awareness and assessment. Dan Pellerin is K-Net's Network Administrator. Dan will work with technology partners and network technicians to coordinate technology deployment, maintenance, and repair. Dawn Carpenter is K-Net's Office Manager and will be responsible for marketing and ensuring the project's sustainability throughout its implementation and operation.

5.3.2 Identify local champions actively involved in the project.

Kuh-ke-nah will be championed by local chiefs and councils who have made significant partnership contributions to the projects. All chiefs and councils have experience negotiating and coordinating major telecommunications infrastructure projects in their communities. These projects include: satellite-based upgrades, digital trunking extensions, installation and operation of local cable systems, introducing and maintaining community access sites. Chiefs and councils will be supported by the formation of Community Information Technology Committees who will actively plan and provide feedback to council and engage users in the community.

5.3.3 Briefly describe the expertise/experience of local champions (one paragraph each) and affiliation.

The Board of Directors of Keewaytinook Okimakanak is comprised of the Chiefs of each of its member First Nations. The Chief of each First Nation is elected according to the rules set out in the Indian Act. Thus every two years there is an election by community members for the position of Chief. Chiefs can be and are elected for consecutive terms. A Chief is traditionally considered to be the ultimate authority within the First Nation with all community matters and decisions resting with them. As the complexity of managing growing communities and infrastructure projects become the norm, this model of governance has moved towards a distribution of decision-making responsibilities among the other elected Council members and program management staff.

Royal Meekis, Chief of Deer Lake First Nation (1994 to the present)

Chief Meekis brings a wealth of administrative experience to the operation and management of Keewaytinook Okimakanak. As the former Band Administrator, Royal understands the importance of tight financial controls and good management. One major local initiative completed under Royal's leadership in 1999 is the multi-million dollar development of the local power generation plant in partnership with Ontario Hydro. He supported the development of K-Net in its infancy and continues to monitor its growth and work in his community.

George Kakekaspan, Chief of Fort Severn First Nation (1999 to the present)

Chief Kakekaspan is the most recent member to join the Board of Keewaytinook Okimakanak. As the former manager of the local Wahsaho Economic Development Corporation, George is very familiar with government programs and reporting requirements. George managed the development of multi-million dollar infrastructure development projects (water and sewer, housing, road construction and maintenance, etc)

as Executive Director of the development corporation. He supports the introduction and use of communication technologies as demonstrated in the recent partnership with Bell Canada / Telesat to complete the local broadband telecom demonstration project.

Maggie Chisel, Chief of Keewaywin First Nation (1998 to the present)

Chief Chisel worked for Nishnawbe-Aski Nation for a number of years as their social services program manager before returning to Keewaywin where the elders asked that she run for chief. She shares the knowledge and wisdom taught to her by her elders and works hard to bring the resources required by Keewaywin to the community. Her latest achievement was brokering a multi-million partnership between various government agencies and Bell Canada to get broadband telecommunication infrastructure and services into Keewaywin by the fall 2000.

Cameron Rae, Chief of North Spirit Lake First Nation (1996 to the present)

Chief Rae leads a rapidly growing and changing community. Phone service is being introduced this spring, a new nursing station is now operational, the local power authority turned on the power throughout the community two years ago, and this is just the beginning. Cameron bridges the gap between the elders and the youth within his community in a unique way. His efforts to ensure the language is protected and maintained is a strong driving force behind these developments within K-Net. His support for strong communication services is demonstrated in the direction he provides both within his community and in the Keewaytinook Okimakanak organization.

Patrick Owen, Chief of Poplar Hill First Nation (1997 to the present)

Chief Owen is involved in a variety of local multi-million dollar developments that is seeing Poplar Hill rapidly take a lead role in innovative economic and infrastructure initiatives. The new water service and plans for improving their local hydro generation facilities recognizes the need for local energy to support these projects. His support and efforts to relocate many of Keewaytinook Okimakanak's programs and services to Red Lake is resulting in improved health care and educational opportunities for his community.

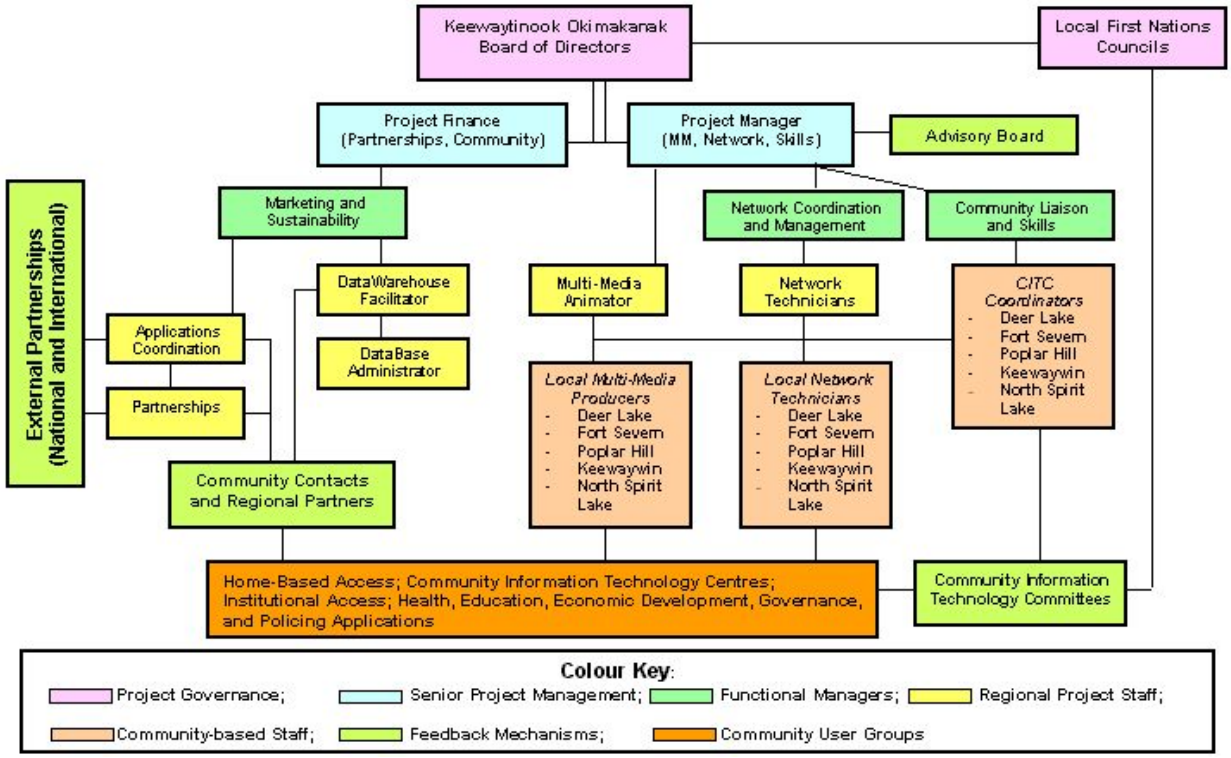
Geordie Kakepetum, Executive Director of Keewaytinook Okimakanak (1991 to the present)

As the former Chief of Keewaywin First Nation and a founding member of Keewaytinook Okimakanak, Geordie has a special relationship and commitment to both the organization and the First Nations it serves. He brings a wealth of experience in the management and leadership requirements of this organization. His unique management style combining flexibility and respect encourages creativity and innovation among employees. His mutual respect and empathy for the Chiefs and the people living in the First Nations ensures a harmonious and productive relationship that challenges everyone to build strong healthy communities.

5.3.4 Describe the level of involvement each had with the project up to submission of the Business Plan.

The Chiefs of Keewaytinook Okimakanak have directed the development of K-Net and this Business Plan from its inception. Progress reports are provided during the regular Chiefs meetings and direction and priorities are determined. Resolutions are drafted during these meetings. The Chiefs worked directly with their councils and community members as they prepared for the introduction of these services and this project (see individual Band Council Resolutions in Appendix A)

5.4 A diagram of the Kuh-Ke-Nah Management structure.



5.4.1 Identify individuals and/or sectors that will be represented on the Board.

The Kuh-ke-Nah Board will consist of the Executive Director of the Keewaytinook Okimakanak Council and Chiefs from Fort Severn, Poplar Hill, Deer Lake, North Spirit Lake and Keewaywin First Nations.

5.4.2 What is management's plan to ensure the successful implementation and governance of the project?

As noted in 5.1.1, and illustrated in 5.4 Kuh-ke-nah will adopt a results-based team management structure. Formal community, industry, and partnership/marketing feedback and advisory bodies reflect a broadly based reference group for management. They also constitute a grounded communication channel to ensure rapid identification and response to critical project implementation issues and accountability to communities and other project partners.

Management has also integrated SMART realities in to its implementation process. For example, travel associated with governance, project management, service delivery and local staff training is replaced with virtual interaction and distributed learning. Board meetings will take place via videoconferencing, training and professional development in the communities -- technical and multi-media production, health and education workers -- will engage CMC methodologies and the Project Management Advisory Board will interact through a project listserve.

Similarly, the project anticipates the transition of local staff and services into community-based businesses and providers. This approach will provide a concrete connection to the sustainability of SMART initiatives as the demonstration phase of the project winds down in year three.

5.5 Who are your project partners?

Kuh-ke-nah has engaged a cadre of broadly-based partners who know this demonstration project will deliver sustainable benefits and opportunities for people in Keewaytinook Okimakanak communities. Although the January 14th SMART deadline posed a process problem for many partners, they have all affirmed their long-term commitment to the use of ICTs in the delivery of services and the development of new products across the Kuh-ke-nah Network. A number of spin-off projects are already being planned as a result of the development of this SMART demonstration project. These partners are listed here by sector (their letters of commitment are indexed alphabetically in Appendix A):

Health Sector: The First Nation Health Directors are working with Orpah McKenzie, Keewaytinook Okimakanak's Health Director to build strong and healthy communities using these communication technologies. The Health Call Centre in partnership with CCAC is the deliverable being planned for this SMART project. As well, a comprehensive telehealth proposal is being distributed to various funding programs to provide a variety of health services utilizing the network. Program partners and funding partners include Community Care Access Centre, Kenora-Rainy River; the Focus group; Health Canada (MSB, HIS, Minister's office); Health Sciences Centre, Winnipeg; Health Sciences North, Thunder Bay; Sioux Lookout District Health Centre; doctors at the Sioux Lookout Zone Hospital; Sioux Lookout First Nations Health Authority and Virtual Professionals Inc (VPI).

Education/Training Sector: The First Nation Education Directors are working with Margaret Fiddler, KO's Education Advisor to develop the virtual high school as part of the SMART project. Additional education and training programs / services will be addressed and funded by a number of other partners including the Ministry of Education (ILC), EDEN Project; SLAAMB; Contact North; Confederation College; Lakehead University; and Nishnawbe-Aski Nation's Post-secondary institute (Oshki-pimache-o-win).

Network Sector: As the only LOI from across Northern Ontario to reach Stage 2 of this initiative, there is much interest from the different groups and vendors providing hardware and network support to demonstrate the potential of their systems. Support has been committed from Bell Canada, Adcom Videoconferencing, Cisco Systems, Telesat, 807-Net and LU-Net.

Keewaytinook Okimakanak First Nations Sector Partners: The Chiefs of Keewaytinook Okimakanak, in Resolution 99/12/14 #1 - "commit the required financial, human and physical resources needed to successfully operate and support the network". This resolution encouraged and supported each Keewaytinook Okimakanak First Nation to make the commitment to identify matching funds from a variety of sources available to them to make this project a reality. Together the Keewaytinook Okimakanak First Nations are committed to assigning more than $5 million dollars of their funds over the next three years of this project to build, operate and sustain the Kuh-ke-nah Network.

First Nation Organizations Partnerships: The projects and services already being delivered by K-Net Services across the region ensured that other First Nation groups would work with Keewaytinook Okimakanak to build and operate this demonstration project. The Nishnawbe-Aski Police Services is working with the provincial and federal governments to finance a remote

bail and remand hearings service. Other partners providing letters for this submission include Assembly of First Nations, Chiefs of Ontario, Nishnawbe-Aski Nation, Wawatay Native Communications Society, Sioux Lookout Aboriginal Area Management Board, Nishnawbe-Aski Legal Services, Nishnawbe-Aski Development Fund and Windigo First Nations Council. As the project develops, existing and new First Nation partnerships are anticipated to develop regionally, provincially and nationally to explore even more applications.

Business Applications Sector: A number of interesting proposals were received from the private sector to partner in the development of new telecom services and products. Working with the Telecommons Development Group (TDG) is proving to be a worthwhile venture as staff members are now being invited to travel abroad on contract with other international development projects. The Education Network of Ontario and CANAIRE are willing to invest in the research and development of the Kuh-ke-nah caching / router initiative. Other SMART consortiums are interested in our on-line cultural and language work (for example the Headwaters Project in Northern Saskatchewan is interested in partnering in a Circumpolar E-Commerce initiative). Other groups include Autodesk for GIS applications, Bearskin Airlines for on-line training and booking services.

Evaluation/Research Sector: The work already begun under the PACTS initiative is being continued at the University of Guelph. Once again we will be working with the university staff and members of TDG to identify best practices and effective ways to share this information internationally.

Government and Corporate Endorsement and Other Expression of Interest in Partnerships: A number of provincial and federal government programs are working with Keewaytinook Okimakanak to assist in the development of the Kuh-ke-nah Network. The provincial Northern Ontario Heritage Fund moved this network to Stage 2 and is now awaiting the completion of a business plan to determine their contribution to the construction of the infrastructure. FedNor has already committed over $2 million dollars in developing broadband telecom services to the Keewaytinook Okimakanak First Nations. The Solicitor General, Canada is exploring ways to deliver better police services in remote First Nations. Corporate sector groups such as Bowater Forest Products Division (Thunder Bay), Ontario Hydro Services Company (Thunder Bay); Placer Dome North America (Red Lake); and Weyerhaeuser Canada expressed an interest in finding ways to work together using the Kuh-ke-nah network.

6.0 SMART Results

6.1 What economic returns, social and cultural benefits and technological advancements are expected from implementation of the project?

The Kuh-ke-nah network will enable new businesses and economic development opportunities and – over time – reduce service delivery costs for communities and institutional delivery agencies. Interconnection with the broadband network will enable local delivery of high speed data to the home. Community cable operations will offer a new service that will provide high quality internet accessibility. The introduction of this service will create a local need for network services and computer repair and stimulate local demand for new computer sales.

Transfer of technology skills and knowledge and community-based multi-media capacity will stimulate the development of passive and interactive e-commerce sites and micro-businesses. Although the local market is too small to sustain most local businesses, tele-densities will generate new revenue for indigenous products and services.

Over the the long-term, SMART connectivity will also result in economic savings for local First Nations and for justice, health and education services. Sale of virtual private networks will permit a range of applications – remand hearings, post-secondary and lifelong learning, and telemedicine/telediagnostics. Each application will create savings by eliminating travel and accommodation from the equation.

Kuh-ke-nah will introduce substantial social and cultural benefits in Keewaytinook communities. The project will have an immediate impact on access to education and local employment opportunities. As the project progresses, communities will see improvements in the accessiblity and relevance of health information and increased lifelong learning and skills training choices.

The development of an on-line high school will give young people the choice to learn in their own communities. Currently, students attend high schools that are hundreds of kilometres away, and are out of the community for months at a time. The on-line high school will give students the option of growing up in their community and reinforce ICT skills acquisition. Similarly, the development of Community Information Technology Centres will create three new jobs in each community. These jobs will be directly tied to community-wide diffusion of ICT skills and knowledge and are expected to be absorbed within small business, institutional provision, and regional services contexts.

Most Keewaytinook communities rarely see doctors. In November, 1999, for instance, Poplar Hill celebrated its first physician visit in more than two years. Local nurses are the primary local health resource. Kuh-ke-nah's partnership with the Kenora Rainy River Community Care Access Centre will relieve some of the homecare load on local health professionals and improve the level and quality of community health services. This partnership provides an opportunity to better meet the cultural needs of health information access through the Oji-Cree Health Knowlegebase project and it creates new health jobs through the Distributed Health Information Call Centre. These initiatives also establish a transitional framework for health professionals and community people to comfortably migrate to advanced applications and services.

The Kuh-ke-nah network will benefit communities by reinforcing and enhancing local cultures and practices. The network will support human dimensions of culture - the capacity to interact, share information, and support one another. The Portal will facilitate inter-community communication – through chat lines, discussion groups and shared community radio streams. The CITC will provide IP videoconferencing that will be used for tele-visits when children are attending post-secondary school or when relatives are at hospital in Winnipeg or Thunder Bay.

The network creates a bridge between traditional knowledge and knowledge workers – it highlights the cultural gifts that people hold and it provides an avenue for making them accessible to others. The Data Warehouse Initiative will provide an incubation structure for building new bases of cultural data – such as land use mapping, interactive elder archives, and on-line language learning games – and the Portal will provide a platform for its distribution. The success of KNET's prototype products – the Iyash Legends Site [flash animation, native language and english text and audio] and the interactive Oji-Cree Dictionary project demonstrate the range of cultural values that a SMART environment will support.

Finally, Aboriginal culture will be sustained through the development of indigenous businesses that market traditional products and services. A web directory of regional native craftspersons will generate revenue and reinforce the viability of cultural practice. Networking also proposes ways to generate new types of tourism. Trappers can be videoconferenced in to major trade shows to market cultural experiences such as immersion camps and Eco-tours.

6.1.1 Describe how you imagine these results will have a transformative effect on the community and the way that citizens interact with one another, institutions, and the world.

The Keewaytinook Okimakanak communities are remote by all measures. Canada its institutions, economic opportunities, political debates, and social policies is a distant land. People in Fort Severn, Keewaywin, North Spirit Lake, Poplar Hill, and Deer Lake have watched Canada move further in to their territories – to enjoy the land as tourists, to take trees and minerals, and to build dams and schools. But there is a perception that Canada does not stay – it comes and goes, looks and takes – all the while keeping its distance.

People who live in the Keewaytinook Okimakanak First Nations see how ICTs can help them transform their relationship with Canada. They understand how information and communications technologies will help them negotiate new standards of living, and they see how early adoption of these technologies will build new capacities and open new opportunities for them. They also understand how ICTs will take them in to new national and international territories how they will help them to find new resources that will sustain the viability of their communities.

The Kuh-ke-nah network will broaden the scope of life in each of the five First Nations. None of these communities has local library access. This often means that dated textbooks are the authoritative text when studying a distant – or their own – culture. The network will provide a general resource for learning – and the Portal will distribute custom resources. The network will transform distance by engaging the world in fresh, intimate and interactive ways – more than anything else the Kuh-ke-nah network will provide a viable alternative to television news.

The Kuh-ke-nah network will touch every life in each community. It will employ some people and train others. It will demonstrate technologies and invite people to plan how these tools could

best be used. For others, Kuh-ke-nah will change the ways that they interact with their friends, neighbours and elected officials. For most people Kuh-ke-nah will change their expectations. It will establish new standards for care in human services. Kuh-ke-nah will also provoke questions about what territory people will visit next and which tools they should take on their journey.

6.1.2 How does the project increase educational opportunities, increase local content, increase local employment and skills development, open new markets through e-commerce, support businesses, increase internet access, reduce the cost of delivering government services?

Children will be able to pursue high-school diplomas without leaving their community; they will be on par with children in Southern Ontario in terms of access to electronic information and data sources. Adults will be able to access distance education programmes over the internet from their home or at the local technology centre; and increasingly, they will be able to develop training opportunities using their language of preference.

For professionals who work in the communities – health professionals and administrators, social workers, teachers, educational administrators, community planners, interactive networking will be an important tool for career advancement and professional development. Distributed learning will augment personal knowledge and satisfy professional accredition requirements.

The siting of Community Information Technology Centres in each community provides a wide base of short- medium- and long-term employment opportunities. In the project's first three years the Coordinator, Technician, and Multi-Media Producer will animate interest, solve problems, provide training, and produce local content. They will also be creating a skills and applications environment to migrate to as the demonstration phase ends. By year three they will have honed marketable community technology planning skills, acquired network LAN/WAN administration experience, and content development, database design and marketing skills.

And others will follow their lead – fixing computers, maintaining websites, planning community development. Telecommons Development Group has indicated that it is interested in using some of the CITC Coordinators for their international communications development workshops. The local cable system will need technicians, each institutional provider will need someone to provide professional development and informatics skills training. Most importantly, the demonstration project will encourage cadres of young professionals who will cut their teeth in the Kuh-keh-nah environment and who will move forward to tele-work for other First Nation, rural and remote communities.

First Nations will see changes in the ways that they do business. Data standards and warehousing will enable EDI with funding agencies and institutional service providers and they will engage a single window approach to Band services. Data policies will also enhance system accountabilty and improve local capacity to track trends within communities. Interactive media will reduce the cost of iterative and consensus based governance. IP videoconferencing will reduce travel costs and let political and administrative personnel spend more time in their communities.

6.2 Describe the quantifiable improvements in economic, social and/or cultural development in communities that are directly tied to the current use of ICTs.

Kuh-ke-nah is a direct result of ICT adoption by communities. KNET's initial technology push in 1995 has been met with a technology pull by the communities. Caching and routing

innovations stem from community-based dissatisfaction with available bandwidth. Keewaywin's recent blueline network is another example of local pull guiding network development. KNET chat has become one of the most used tools on the main website – adding a whole new social region to community experiences. Finally, KNET has produced high quality interactive cultural products – the Legends and Dictionary sites – that emphasize the thirst among First Nations for information about themselves.

6.3 Describe a strategy to market Cdn developed SMART technologies/services including methods of facilitating learning and community development.

Kuh-ke-nah has identified three key elements for raising awareness of SMART Canadian products and services and for encouraging transfer of SMART skills and knowledge. These elements are marketing, conferencing, and engagement. The marketing element will stimulate partnerships among institutional service providers and identify potential in similar First Nations contexts. This process will highlight the potential for telehealth, and telemedicine applications and use Keewaytinook's lead position to aggregate interest in distributed health informatics applications, services and technologies.

The conference element will bring practitioners together with SMART audiences and commercial product and service providers. These conferences will provide a way to share best and emerging practices, to showcase success stories and network with community and organizational representatives. The first conference will provide a F2F regional forum for diffusing the innovations that Kuh-ke-nah's SMART initiative will introduce. Subsequent national and international conferences in the second and third year of the project will host on-line displays, presentations, fora, and demonstrations. In addition to staging these conferences, key Kuh-ke-nah managers will attend other symposia and seminars to continue to share information and market Canadian products and services.

The engagement element harnesses the experiences and decisions made by people using SMART services in communities. The participatory methodology that it is built on and the work of local Coordinator's adapting and animating this approach will be an important tool for identifying emergent needs and for adjusting local activities, outcomes and results. Each community will develop a local process using a common participatory methodology that has been piloted and evaluated in Red Lake and Fort Severn by Telecommons Development Group.

The engagement process highlights two important functions. It establishes desired results within each community and it regularly tracks and reviews these benchmarks to assess progress. In this way, the process decentralizes ICTs and encourages local learning and project ownership. This process also ensures that the project Board and Management receive formal community feed back – directly through the CITC Coordinator and from the CITC Committees through the local Chief and Council.

KNET's unique approach to community-based ICT development will be profiled as a case study in the University of Guelph's PACTS study. The report entitled "Lessons learned and accomplishments of Community Networks in Ontario" will be published in March, 2000 and will constitute an independent review of what lessons from K-Net are transferable elsewhere, what principles and steps are critical, and what elements are unique to the setting.

The Kuh-Ke-Nah Business Plan is committed to putting communities in control so that ICTs are harnessed to work towards communities' cultural and economic development visions. Transferring this experience elsewhere starts by learning from K-Net's experience. The strategy to market the Kuh-Ke-Nah-developed technologies, methods and services is SMART in that it is reflective of the components that make it work, each can be understood and packaged separately, but as a whole they offer a World-class achievement.

6.4 What are the expected results against which your community's demonstration project will be assessed?

Engagement workshops identified a range of desired results for SMART and other ICT-based projects. Primarily, communities want to achieve broadly based results Community well-being, Self-determination and Governance, and Enhanced Community Capacity. These results are listed below. Nested within each Result is a series of outcomes and outputs that would indicate progress towards results.

Community Well-Being

- Improved quality of life in communities
- Higher retention rates for students registered in the on-line high school
- Post-secondary partnership for distributed certification of local technicians and multi-media producers
- 65% of elementary school students create their first works in digital format
- Expansion of Distributed Health Information Call Centre to other provincial jurisdictions Net in-migration of youth (ages 15 to 25) to communities
- Improved quality of life in communities
- Implementation of a comprehensive telehealth solution in K.O. communities
- Local Information Technology Committees continue after year three
- Two IT Coordinators are contracted to lead ITC engagement workshops in developing countries
- An archival database of local elders features photos, video- and audio-clips
- CITC employees migrate to other IT jobs in the community
- 50% of the population self-identifies as digitally literate
- Local youth create and regularly update a comprehensive web resources site

Self-Determination and Governance

- Development of on-line data resources that are relevant to each community (GIS/Traditional Knowledge mapping; Emergency preparedness; Northern Resources Inventory)
- Chiefs use IP videoconferencing to replace monthly regional meetings
- Agreement on data standards and definitions for health, education, and social services
- Creation and integration of community and regional data warehouses
- All Portal Main pages are available in English/Syllabics and include 'sound bite' summaries in Cree and Ojibway
- One micro-business in each community is generating 100% of its sales through electronic commerce.
- All local Businesses using the Web to market their services
- EDI used for all economic transactions by Band administration

- First Nation administration adopts a single window approach

Enhanced Community Capacity

- Signed agreements for Virtual Private Networks across all community sectors
- Economic justification for expansion of broadband network to other First Nations
- 30,000 daily hits on the Kuh-ke-nah Portal
- Kuh-ke-nah Portal awarded "Best of the Web" award once in three years
- 75% or more of the total population actively using e-mail
- 90 percent of households purchase high speed internet cable service
- Successful transfer of CITC to community cable operator
- Local Cable operator is viable after three years
- Kuh-ke-nah product is the predominant caching/routing solution for remote/small community applications in the global marketplace.