In this chapter we describe the Kuh-ke-nah Network (K-Net), an example of broadband deployment in telecom high-cost serving areas (HCSAs) that emerged to address the telecommunications and computer service needs of remote First Nations in Northwestern Ontario. Our account is based on four years of work with Keewaytinook Okimakanak (KO) Tribal Council, the not-for-profit organization responsible for K-Net’s overall management and development. KO was an original research partner of the Canadian Research Alliance for Community Innovation and Networking (CRACIN), and has supported field visits to Northwestern Ontario First Nations by CRACIN researchers in 2003, 2004, 2005, and 2006. Our research has been participatory, pairing CRACIN researchers with First Nations community representatives to pursue an inquiry into how K-Net developed up to its first phase of broadband deployment, between 1994 and 2006. In the process we have also examined how K-Net’s organization operated as a technical, economic, and socio-political network during this time period. There is much to yet learn and discover as K-Net and its environment continue to transform. As of 2011, several CRACIN-associated researchers continue to collaborate with K-Net members on applications and research (Beaton et al. 2010; Caidi, Fiser, and Lam 2009; Fiser 2010; O’Donnell, Walmark, and Hancock 2010).
In this chapter we focus on K-Net’s early historical development as a reflection of Northwestern Ontario’s economic and socio-political context. With its inception in 1994, as a 14.4 baud bulletin board system, K-Net served as one of the oldest examples of community networking that CRACIN studied. In terms of its technical size, K-Net comprises over a hundred community broadband points of presence (POPs). This includes Aboriginal communities and related organizations across Ontario. K-Net Services, KO’s network management organization, also provides support to northern satellite-served communities in Manitoba and Québec.

As a distinguishing feature, K-Net POPs enable small remote First Nations to develop and control local Internet services, while participating in a regional network of broadband applications that includes video conferencing, the voice-over Internet protocol (VoIP), and IP-cellular telephony, as well as services such as KO Telemedicine, and the Keewaytinook Internet High School (Fiser, Clement, and Walmark 2006). In this chapter, we seek economic and socio-political explanations for K-Net’s rapid growth and technical achievements as a community network. We identify a historical series of economic and socio-political partnerships that paralleled K-Net’s technological evolution and advanced its development. In short, K-Net’s evolution was greatly accelerated by KO Tribal Council’s active participation in the national Connecting Canadians agenda, and related Industry Canada initiatives, circa 1994 to 2004.

As an object of policy, K-Net has been a vehicle for nearly all of Industry Canada’s major community connectivity programs, including First Nations SchoolNet and the Community Access Program (CAP), as well as broadband- and spectrum-related projects under the Smart program, C-Band Public Benefits initiative, and National Satellite Initiative. It is our thesis that KO Tribal Council leveraged socio-political relationships, particularly under Connecting Canadians, to reinforce local community networks and demonstrate the efficacy of K-Net’s decentralized approach. Nevertheless K-Net’s interplay of efficacy and socio-politics is dynamic and part of a dense constellation of interests that are outside KO’s locus of control. Our account of K-Net’s past achievements does not therefore predict its future state in an uncertain policy environment.

**Early Telecommunications in Remote Regions: Costs Versus Needs**

Large-scale telecommunications development in the remote regions of Canada is encumbered by higher-than-average costs owing to the low population density of these regions with respect to the vast distances that separate their respective settlements. In Northwestern Ontario, the average distance between
the twenty-four resident First Nations communities and their nearest town service centre is approximately 300 kilometres by air. The region is around 385,000 square kilometres, with a total population of less than 30,000, including the populations of the two nearest towns, Red Lake/Balmertown and Sioux Lookout (see figure 14.1). These conditions severely hamper the growth of a competitively viable broadband telecommunications industry for the region.

**Figure 14.1** Map of Keewaytinook Okimakanak First Nations in Northwestern Ontario. Courtesy of the Keewaytinook Okimakanak Tribal Council.

As demand in high-density markets feeds competition and innovation in telecom, companies in remote regions do not readily have a critical mass of subscribers to help them recover the costs of physical infrastructure development. Risk on investment is high, and partnerships between industry, government, and consumer interest groups are particularly important for providing incentives to business and to develop supply. In the remote environment, public
procurement may be the most profitable contractual arrangement for ISPs. The disposable incomes of residents in small remote communities is typically less than the national average, while the public organizations that serve residents, such as schools and hospitals, have a regional and federal tax base that can support large capital projects for communications infrastructure.

Public organizations can play an important role in shaping the economies of remote regions. This is especially the case in Northwestern Ontario's remote First Nations, where federal government departments, such as Indian and Northern Affairs Canada (INAC) and Health Canada, provide core funding for community infrastructure and social services as part of the federal government’s treaty-based fiduciary obligations to First Nations’ members. In this context of federal-Aboriginal jurisdiction, the provincial government of Ontario plays a secondary supportive role, while also being implicated to varying degrees in the delivery of essential services such as medical care, transportation systems, employment training, and even education.

As for the role of private sector entities, whereas market discipline can be a valuable driver of telecom innovation in high-density urban sectors, high-cost, low-density markets are usually on the fringes of a monopoly incumbent local exchange carrier’s (ILEC) territory. Here the ILEC has little to no threat of entry by companies of comparable size. In Northwestern Ontario (north of the 51st parallel), Bell Canada (now Bell Aliant) has been the monopoly ILEC since the mid-1970s, and its only terrestrial threats have been local municipally focused independent operators, such as the Thunder Bay Telephone Company. Bell’s competitors have so far had little impact on its monopoly over the First Nations’ terrestrial telecommunications option, one of the reasons being that these independent operators have a substantial cost disadvantage compared to Bell’s already established infrastructure.

Public subsidy has dominated telecommunications development in Northwestern Ontario. Bell’s entry in the 1970s was stimulated by strategic investments on the part of Ontario’s Ministry of Transportation and Communication. At the time, the incumbent’s strongest customer base in the Northwestern Ontario First Nations consisted of Health Canada-funded nursing stations. In need of a communications network between community nursing stations and the Sioux Lookout District Zone hospital, the department first bulk-purchased high frequency (HF) radios and later acquired telephone links for nursing stations in the most populous communities (Dunn et al. 1980; Conrath, Dunn, and Higgings 1983). These stations have traditionally served as community health centres and hubs for the local populations and smaller surrounding neighbours. Notwithstanding the clinical context, residents perceived their emerging communications network as part of a First Nations community communications infrastructure (see Fiser and Luke 2008).
Conrath, Dunn, and Higgings (1983) report that nursing stations did not consider HF radio—or “trail radio,” as it was called—to be a reliable communications device and opted for access to the public switched telephone network (PSTN) where it was available. Local residents, however, formed the Wawatay Native Communications Society, which helped First Nations members produce local media and actively promoted their use of trail radio for interpersonal communications. With Wawatay’s support, trail radio became a channel to maintain ad hoc community networks between settlements and outlying family camps, traplines, and hunting lodges “on the land.”

As technical options for community media improved throughout the 1970s and 1980s, local residential demand expanded and Wawatay became a champion and resource centre for the local uptake of First Nations communications technology. Among its achievements, Wawatay successfully established a bilingual newspaper featuring northern Ontario news in Oji-Cree and English, as well as a northern Ontario Aboriginal radio station, in partnership with the Canadian Broadcasting Corporation (Hudson 1977; Mohr 2001). Wawatay also introduced video production in the mid-1980s, and later joined the Aboriginal Peoples Television Network (APTN) in 1999. These facets of its regional communications strategy continue to enrich northern Ontario (see http://wawatay.on.ca).

As an immediate historical predecessor to K-Net, Wawatay represents the important strategy of community relationship building to aggregate local consumer demand and build local capacities for technology deployment and management. Wawatay successfully diffused new communication technologies to First Nations community members, and it developed local awareness and technical capabilities to support community media that reflected First Nations needs and desires (Mohr 2001). As a community network, K-Net would later build upon the same strategy and tactics. However, Wawatay’s historical milieu lacked federal and provincial partnership opportunities to help it make deeper connections to telecom service provision. Indeed, by the early 1990s, Wawatay and Canada’s other forty or so Native Communications Societies suffered drastic cutbacks in federal support (Mohr 2001), just as the federal government started to seek out new partnerships for the emerging information highway initiatives that would become Connecting Canadians.

In this period of Northwestern Ontario’s history, leading up to K-Net’s emergence and first experiments with computer-mediated communications (1970s to mid-1990s), Health Canada and Indian and Northern Affairs Canada (INAC) were the largest consumers of available bandwidth. As such, it was the public sector and its administrative needs that primarily shaped pathways for innovation in Northwestern Ontario’s telecom infrastructure. Without public sector interest and financial backing, the comparatively resource-poor, mainly
residential consumers in the First Nations were left to adapt what technologies they could salvage (such as HF radios). Moreover, the absence of more than one or two telephone access points in the remote communities severely restricted bandwidth and impeded opportunities to experiment locally.

**FIGURE 14.2** Two K-Net Services staff members playfully demonstrate the inadequacy of public telephone infrastructure in KO First Nations, circa 2000. Photograph courtesy of the Keewaytinook Okimakanak Tribal Council.

**IN PURSUIT OF A BROADBAND DEPLOYMENT OPTION**

In Northwestern Ontario, the First Nations’ telecom infrastructure has been based around two Bell-owned/controlled microwave backhaul systems, one north of Red Lake and the second north of Pickle Lake. These were the systems that Bell had developed in partnership with Ontario’s Ministry of Transportation and Communications between 1975 and 1979 under an initiative known as the Rhodes agreement. Total capital expenditure on the original analog systems was approximately CAD$15 million (circa 1979), largely paid for by the ministry under a mandate to invest in Northern Ontario Remote Area Communications and Transportation (NORACT).

Change crept slowly after this. Twenty years later, the digital upgrades to Bell’s analog infrastructure cost over CAD$20 million (circa 2000). The upgrades created a broadband deployment option and were undertaken between 1998 and 2000, this time by Bell, participating First Nations, federal partners (Industry Canada, INAC, and Human Resources Development Canada), and the province’s Northern Ontario Heritage Fund Corporation. By
itself, the First Nations’ regional leadership could not afford to entice Bell to pursue a broadband deployment option. Bell had no internal incentive to make digital upgrades, nor were the First Nations’ largest public sector organizations, Health Canada and INAC, prepared to be sole or majority investors in an eventual broadband solution. How the digital upgrades came about, and how they came to be partially community based under K-Net, can best be explained by an examination of the historical emergence of new public sector investors, particularly Industry Canada, under the federal Connecting Canadians agenda.

1994 to 1999: A New Internal Coalition and a New External Investor

In the mid-1990s, Health Canada conducted experiments with broadband satellite on a limited trial period to support clinical video conferencing between two community nursing stations (Kitchenuhmaykoosib Inninuwug and Webequie), the Sioux Lookout District Zone hospital, and the Indian Health Services Regional Office in Ottawa. It concluded that the experiments (dubbed Merlin) were too costly to extend as services. The other major public sector player, Indian and Northern Affairs Canada (INAC), had no specific mandate for broadband, and in some small, very remote communities it had no mandate to support plain old telephony. Since the 1970s, INAC had become heavily invested in other costly forms of community infrastructure, such as sewage, water treatment, electrification, and improvements to community buildings and housing (Fiser 2004). Yet, in the 1990s, its regional managers were willing to support special projects and follow the lead of seed investors.

For their part, the Northwestern Ontario First Nations, and their respective regional service organizations from the hub towns of Sioux Lookout and Red Lake/Balmertown, were exploring options to work around Bell’s analog telecommunications system. Their coalition reached out to external players such as Industry Canada and the Province of Ontario. They also lobbied Canada’s national regulator, the Canadian Radio-television and Telecommunications Commission (CRTC), as it was undertaking a national review of the rules of telecom business in Canada’s high-cost serving areas. In both cases, they researched local consumer needs and challenges, and tapped industry contacts to study the technical and economic feasibility of alternate communications technologies such as MSAT satellite phones (K-Net Services 2001).

Calling itself the Northern Ontario Telecommunications Working Group, the coalition originally followed the lead of Wawanay Native Communications Society, and consisted of important regional service organizations such as the Sioux Lookout Aboriginal Area Management Board (SLAAMB), Nishnawbe Aski Development Fund (NADF), Nishnawbe Native Education Council (NNEC), the Sioux Lookout First Nations Health Authority, the Sioux
Lookout District Zone hospital, Nishnawbe Aski Police Services, Nishnawbe Aski Legal Services, Nishnawbe Aski Nation, and tribal councils such as Kee-waytinook Okimakanak (KO), Shibogama, Windigo, Matawa, Wabun, the Independent First Nations Alliance (IFNA), and Mushkegowuk (in the eastern part of the region) (K-Net Services 2001).

Most of the regional service organizations joined the coalition to fulfill particular institutional mandates, such as to improve the delivery of healthcare, education, or policing. Their representatives hoped that together, their aggregate regional demand would help drive a common community access solution for improved telecom infrastructure. Some regional entities, such as SLAAMB and the NADF, had broader mandates to invest in First Nations community economic development, and were less restricted by an expectation of what broadband should do in terms of public service delivery. The coalition hoped that their respective focus on development would help stimulate job growth and new industries by way of local capital projects, as well as employment training for First Nations computer technicians, network administrators, and applications developers.

As for the organizations that directly represented interested First Nations, Nishnawbe Aski Nation, the tribal councils, and First Nations leaders had an immediate interest in improving communications and services for community constituents. The coalition decided that it was in its members’ best interest to develop a shared telecom system that was reliable, affordable, and scalable. In terms of its overall direction, the coalition was fairly consistent in its mission throughout the 1990s, although Wawatay suffered an organizational upheaval brought on by diminished resources (from federal cutbacks to Native Communications Societies) and in 1998 transferred its leadership role to KO Tribal Council’s K-Net Services branch.

KO Tribal Council, K-Net’s founding partner and management organization, had a special interest in changing the analog telecommunication system as it existed since the 1970s’ Rhodes agreement. KO represented six First Nations communities: Deer Lake, Fort Severn, Keewaywin, McDowell Lake, North Spirit Lake, and Poplar Hill (see figure 14.1). Two of these communities had no direct telephone access. Another (Fort Severn) was Ontario’s most northern community, with limited telephone access and little hope for terrestrial broadband access. Another depended almost entirely on access to the town of Red Lake/Balmertown for services.

The elected chiefs of these First Nations thus felt the pressure of concerned constituents and made telecom a policy priority. KO also had two education program staff members, Margaret Fiddler and Brian Beaton, who had initiated and implemented Wahsa, one of northern Ontario’s success stories in distance education (McMullen and Rohrbach 2003). Beginning in 1991, Wahsa
combined radio broadcasts, paper-based course packs, periodic community visits, telephone follow-ups, and even faxes where available. With their backgrounds in education, their strategic use of multimedia, and a mandate from the KO chiefs to improve learning opportunities for First Nations youth, Fiddler and Beaton set out to explore computer-mediated communications over the analog telephone system (see Beaton and Fiddler 1999). K-Net Services appeared in 1995 after a year of planning and small-scale pilots. (For a closer look at these formative projects, see chapter 13.)

In its historical milieu, KO was a relatively young tribal council, having been incorporated in 1992. Other Sioux Lookout District councils, such as Windigo and Shibogama, had already made significant changes for member First Nations. They had paved the way for winter roads, electrification, and air transport in the 1970s and 80s, and though not every small First Nation shared in such amenities, these councils helped to modernize development and were already legacy keepers by the time KO appeared. In terms of positioning the KO communities in this regional economic landscape, KO’s chiefs had found a relatively unoccupied operating niche to cultivate, as well as an important source of symbolic capital in the emerging computer services and telecommunications fields of the 1990s. Through the work of its K-Net Services branch, KO rapidly became a recognized leader in northern Ontario, legitimated by the endorsements of area First Nations and councils within the regional socio-political forum of the Nishnawbe Aski Nation (Kakekaspan and Beck 2003).

KO built its reputation early by coupling technology development with local employment training initiatives. From 1995 to 1999 KO’s K-Net Services worked with the Sioux Lookout Aboriginal Area Management Board (SLAAMB) on a series of human resource development initiatives to deliver computers and computer skills training to the twenty-four Sioux Lookout District First Nations. With initial support from SLAAMB and INAC’s regional office they developed a K-Net bulletin board system (BBS) with modems over the existing analog telephone infrastructure. The BBS was originally conceived to allow email between the First Nations and the local boarding school Pelican Falls, where their youth attended high school. From that application it evolved to become a platform for delivery of training courses and to host virtual conferences on behalf of the First Nations and regional service organizations (particularly in education). As the K-Net BBS expanded across the region in 1996, four of the twenty-four First Nations still had no access to the analog telephone system, and KO couriered floppy disks back and forth to enable their participation “online.” None of the member First Nations could access the Internet through the K-Net BBS, but owing to parallel developments by a group at Thunder Bay’s Lakehead University, an ISP, LU-Net, was established in the town of Sioux Lookout and several neighbouring communities.
First Nations with access to K-Net BBS and/or dial-up Internet via LU-Net experienced frequent data transmission failures and paid long distance charges as high as CAD$25 per hour. There was little to no residential access outside the towns, and users in the remote First Nations frequented community access sites, usually a computer terminal within an INAC-funded school or band office (administrative centre). However, in 1996, K-Net Services received a substantial boost after it won a contract to become a helpdesk for Ontario’s 144 First Nations schools under Industry Canada’s newly created First Nations SchoolNet program. This was the beginning of a radically new technology partnership for the Northwestern Ontario First Nations.

SchoolNet had emerged in 1993 as part of the first federal information highway mandate, and it grew to prominence under Industry Canada’s Connecting Canadians agenda (circa 1998). Industry Canada, largely an outsider to the First Nations’ public sector economy, had a mandate to subsidize community Internet access points, to deliver computers for schools, and to build up Canada’s connectivity profile on the world stage. Although SchoolNet was its national showcase, Industry Canada also instituted the Community Access Program (CAP), a refurbished computer delivery program called Computers for Schools, as well as a web content creation initiative called Canada’s Digital Collections, to promote wider public uptake of computers and the Internet. KO’s K-Net Services coordinated grant submissions with all of the Sioux Lookout District’s tribal councils to lever each of these funding programs, and through their joint initiative with Industry Canada, by 2000 they had built an Internet-accessible community computing infrastructure in at least seventeen of the twenty-four First Nations, with thirty-five Ontario First Nations in total having public Internet access through a K-Net Services-supported SchoolNet connection.

Although dependent on short-term grants for capital and operating funds, this infrastructure became community owned through the care of local (K-Net Services and SLAAMB trained) band technicians, school staff, and volunteers, who together with KO and its government partners, offered K-Net to individual consumers and civil society as their First Nations version of the information highway.

Riding a wave of federal program investments that the Connecting Canadians agenda had stimulated, K-Net Services helped the national First Nations SchoolNet program equip First Nations schools with DirecPC satellite connections, from 1996 to 1998, which Bell Canada and the now-defunct Stentor Alliance of telecommunications companies (including Telesat) had donated, in part, to compensate for their poor terrestrial services in high-cost serving areas. In 1998, Industry Canada’s mandate expanded in scope under the federal Connecting Canadians agenda, which enlarged the purse of its Information...
Highway Applications Branch and redirected its focus toward more ambitious projects, such as overall community connectivity for broadband deployment, at a target inbound bit rate of 1.544 Mbps following the recommendations of Industry Canada’s Communications Research Centre and the National Broadband Taskforce.

Yet it appeared that so long as the First Nations had no control over the points of presence (POPs) and local loop infrastructure that distributed the ILEC Bell’s terrestrial bandwidth, they and their allies would have little chance to create affordable shared broadband connections for individual consumers and civil society. This diagnosis pertains to the coalitions’ observation that Bell would not (and given a per-community capital expenditure of between $400,000 and $1.5 million probably could not) make a business case for residential connectivity without bold public sector support.4

At times, the Northwestern Ontario public sector’s regional service organizations had difficulty following KO’s tribal council lead. Their important service mandates for health, education, and policing meant that they had to answer to the federal and provincial government departments that funded them, such as INAC and Health Canada. K-Net was becoming the region’s showcase technology, a simultaneous revelation of the analog telecom system’s inadequacies and a demonstration of the possibilities that could be harnessed if broadband Internet infrastructure was in place throughout the Sioux Lookout District and greater territory of Nishnawbe Aski Nation (K-Net Services 2001). K-Net also represented the public sector organizations’ likely future orientation, particularly in terms of their evolving data-communications needs and the partial transformation of their services into broadband e-services.

The disjuncture between partial visions and realities thus created uncertainty within K-Net’s coalition of regional allies, particularly around the question of how to steer K-Net’s development beyond the millennium. Members had to find a balance between KO’s leadership role and its emphasis on the decentralized community ownership of POPs and community networks, with their more centralizing policy pressures to maintain regional, as well as federal and provincial, standards for service delivery in healthcare, education, and policing.

In the 1990s, some members of the public sector, particularly staff at the Nishnawbe Native Education Council (NNEC), which disbursed INAC education funds, openly wondered whether K-Net should remain a KO Tribal Council initiative and not become absorbed into a regional service organization such as NNEC. The rationale was that KO officially represented only six of the twenty-four Sioux Lookout District First Nations that the NNEC represented, notwithstanding the more than twenty other First Nations in the larger Nishnawbe Aski Nation of northern Ontario. KO’s chiefs were directly
answerable to their community constituents (who elected them) and were not specifically responsible for any of the other communities or services that K-Net involved. However, setting aside those perceptions, KO’s leadership role ran deeper than the politics of representation, for it was KO’s chiefs who had identified the opportunity to develop a competitive advantage in the field of telecommunications, and now its staff had the capabilities and robust federal program ties to make broadband deployment a regional economic reality. No other organization in the region had the capability during the specific period when the Connecting Canadians agenda was prepared to take off into further rounds of investment in telecom high-cost serving areas. Given the momentum that was behind KO/K-Net Service’s capabilities at the time (circa 1998–2000), it is difficult to envision feasible alternatives for rallying partnerships and organizing a broadband solution for Northwestern Ontario’s First Nations.

By contrast, the public sector’s regional service organizations, such as the NNEC, the Sioux Lookout First Nations Health Authority, or Nishnawbe Aski Police Services, were in no position to fund the capital costs of infrastructure development out of their own budgets, let alone support the ongoing operating expenditures of K-Net, without additional assistance from federal and provincial programs. At this time, their core mandates were not aligned with any concrete connectivity policy, and thus, they, alongside the local First Nations bands and councils, followed KO’s appeals to Industry Canada in support of K-Net’s community computing infrastructure strategy, simply to enable Internet access for their staff operating in the First Nations. The health organizations for example, were severely restricted by Health Canada, which would not commit to K-Net until 2002, after KO and several health service organizations undertook a series of pilot projects and delivered an extensively researched regional proposal for community-based telemedicine (Rowlandson 2005). Similarly, in education, and despite some of the NNEC staff’s reservations about K-Net’s tribal council leadership, the NNEC had few funds in its education mandate to commit to connectivity, and its managers were dependent on KO’s ability to draw connectivity funding from First Nations SchoolNet and similar Industry Canada initiatives. Administrative differences had to be set aside if K-Net’s transformation was to continue in a positive direction for Northwestern Ontario.

1997 to 1999: An Opportunity to Change the Course of Development

Industry Canada’s partnership with KO and K-Net’s coalition of regional allies was a major force for regional change, but the catalyst for systemic change was a national regulatory review of the state of telecommunications high-cost serving areas by the Canadian Radio-television and Telecommunications Commission, begun in 1997 (see CRTC 1997). In itself, the regulatory review
accomplished little to compel incumbent service providers such as Bell to deploy broadband; but it established a policy arena for consumer groups to find common ground, voice their concerns nationally, and confront service providers with their concerns. For Northwestern Ontario, the CRTC review was fortuitous, as it coincided with the K-Net coalition’s gathering strength under Industry Canada’s Connecting Canadians agenda. Through Wawatay, the coalition had earlier appealed to Industry Canada FedNor, the federal economic development initiative for northern Ontario, which gave members a grant to study local telecom access conditions and survey market demand before appearing at the CRTC proceedings. KO’s K-Net Services levered this research process into a regional networking strategy.

In 1995, FedNor had funded an Aboriginal Working Group to advise on regional telecom policy, as well as a study of forty-eight First Nations across Northern Ontario, in order to assess their telecommunications and computing needs against the prevailing realities of the telecommunications systems in place. It concluded that extensive investment in infrastructure would be required if broadband was to become feasible in the remote regions. By 1998 FedNor was prepared to become a seed investor for the digital upgrades to Bell’s analog systems. In the 1990s, FedNor was investing approximately CAD$50 million annually in diverse northern Ontario municipal, Aboriginal, not-for-profit, and private-sector economic initiatives. The development of telecommunications and information technology had been one of its specific mandates (as part of Industry Canada). FedNor’s interests dovetailed well with the interests of Wawatay, KO’s K-Net Services, and coalition allies. It also had no interest in managing infrastructure (or some layer of service within) but was open to supporting a First Nations-controlled broadband deployment model, provided that the K-Net model could work with the incumbent telephone companies to promote the industrial sector and fulfill public sector requirements for service delivery and quality of service.

WHAT K-NET ACHIEVED

At the heart of the CRTC hearings was the question of what incumbent local exchange carriers such as Bell owed to their customers in high-cost serving areas. Although Wawatay and KO’s K-Net Services lobbied valiantly for the CRTC to include a broadband-service option in its bundle of essential services to high-cost serving areas, their proposals were overwhelmed by the reluctance of the incumbent local exchange carriers. The CRTC concluded that broadband was not an essential service, at least not one it would support through the national system of subsidy it managed to help ILECs defray telecom costs in high-cost serving areas.
Nevertheless, the coalition from Northwestern Ontario and allied consumer groups from high-cost serving areas across Canada did gain ground on a number of important service issues, including the elimination of long-distance charges for dial-up Internet (CAD$25/hour in some Northwestern Ontario communities), and the implementation of single-line touchtone service, operator and directory assistance services, and 911 emergency call services. Moreover, the CRTC’s commissioners called for a broadband service debate to continue and acknowledged the value of innovation in telecom and a need for new public-private partnerships, such as those that Industry Canada FedNor was prepared to make. In response, KO’s K-Net Services and the coalition continued their mission, hopeful that FedNor and other public sector programs were ready to support broadband deployment as part of a shared services model.

From 1998 to 1999, KO worked on a grant proposal to establish a wide area network (WAN) between its six member First Nations and offices in Sioux Lookout and Red Lake/Balmertown. FedNor was a seed investor, as was its provincial counterpart, the Northern Ontario Heritage Fund Corporation (NOHFC), a crown corporation with a similar economic development mandate. The vision that was to be realized in this next iteration of K-Net was of a First Nations-controlled IP network that would ride atop leased terrestrial and satellite carrier infrastructure from Bell, and Telesat Canada, which Bell owned at the time. This vision acquired further legitimacy after KO successfully bid to become one of Industry Canada’s Smart Community demonstration projects and acquired a purse of CAD$5 million in 2000, after two years of proposal work, based on its designs for a community-based WAN to augment the community computing infrastructure it had developed through First Nations SchoolNet and CAP (Ramírez et al. 2003).

Yet, during the period between 1999 and 2000, two major economic and technological obstacles stood in K-Net’s way: (1) carrier backhauls had to be upgraded or, in the case of satellite, be established, and (2) community local loops had to be upgraded and/or built to accommodate shared Internet connections in participating First Nations.

Between 1999 and 2000, the ILEC Bell spent approximately CAD$20 million in capital expenditures to upgrade its northern Ontario systems to digital service infrastructure. Bell had made this decision to invest based on its reading of the climate for public-private partnerships and the joint federal-provincial commitment to growing broadband services, particularly in public sectors of the high-cost serving areas. In Northwestern Ontario, Bell invested approximately CAD$8 million in upgrades to its Central Offices, with about CAD$1 million of additional support from FedNor. In addition, FedNor, the NOHFC, and public sector partners such as INAC and Human Resources Development...
Canada, invested in the First Nations’ local loops, for a combined investment of approximately CAD$3.2 million (K-Net Services 2001). This series of concentrated public-private partnerships substantially reconfigured the ailing analog telecom system, which resulted in the availability of shared terrestrial broadband POPS in thirteen of the area First Nations and spurred the development of a special not-for-profit satellite arrangement for the remaining eleven First Nations (and allied communities in Québec and Manitoba), also with substantial support from Industry Canada FedNor.

**Backhauls and Points of Presence**

Since 2000, terrestrial broadband POPS in Northwestern Ontario have entailed T1 connections, at 1.544 Mbps, leased from the ILEC Bell (now Bell Aliant). Our research with K-Net has found that the price of a T1 connection (1.544 Mbps) to remote communities of Northwestern Ontario has been as high as eight times the price offered to communities in large metropolitan areas such as Toronto (e.g., CAD$8,000:1000/month). In this case the prices are set by Bell’s rate band system, largely on the basis of population density. With ongoing technological change and government subsidy, particularly from FedNor and its Ontario counterpart, the NOHFC, the T1 price gap has narrowed to approximately four times the high-density urban price (CAD $1,270:350/month). However, other significant differences remain between the quality of service offered to remote communities and their high-density urban counterparts. Connections to remote regions come with minimal service guarantees largely owing to the distance of the communities from the nearest telephone company’s service depot. This means that remote customers may wait longer for repairs, and have to devise local technical capabilities and human resource strategies to enable effective monitoring and repair of local telecom equipment, particularly in terms of local loop infrastructure and customer premises equipment (CPE) owned by the communities’ vested authority and customers.

In K-Net’s historical milieu, Wawatay had experienced similar human resource challenges during its early HF radio days in the 1970s and with the maintenance of its community-based radio network (Mohr 2001). KO’s K-Net Services had also experienced this human resource challenge in the 1990s as its two-person staff worked with over fifty First Nations to establish DirectPC satellite connections under First Nations SchoolNet and earlier, during K-Net’s BBS days. From the beginning of its career in computer-mediated communications, KO had worked with the regional Sioux Lookout Aboriginal Area Management Board (SLAAMB) to establish the knowledge that local First Nations technicians would require to maintain computers, modems, and later Internet access points, Ethernet local area networks (LANs), and wireless area networks.
Pushing necessary knowledge and skills to the edges of K-Net’s emerging network, out of the need for survival, also led to local innovations. KO and several of K-Net’s most remote partners worked with Industry Canada FedNor, for example, to devise an alternate MSAT phone solution that made DirecPC feasible in remote communities that lacked the infrastructure for a dial-up uplink (as required by the technology). Such learning experiences (over a span of five years) prepared KO and its coalition of allies to negotiate the feasibility of community-owned broadband local loops (access networks) with the ILEC Bell and government partners.

The technical prowess of KO and its allies convinced FedNor and other public sector partners that local First Nations ownership and co-operative network management, rather than centralized public or private sector ownership, were the proper pathways for broadband deployment in remote Northwestern Ontario.

With FedNor onside, as a complementary regional/federal advocate based in the “metropolitan” area of Thunder Bay, in Northwestern Ontario, it was easier for KO and K-Net’s coalition of allies to communicate their interests before other government players and the incumbent Bell (now Bell Aliant). Thus KO’s WAN project was implemented and became a prototype for broadband infrastructure development across the twenty-four Northwestern Ontario First Nations (gradually and with multiple investors between 2000 and 2005). Yet between 2000 and 2002, the missing link in Northwestern Ontario was a broadband option for eleven of the First Nations, which were not slated to benefit from the upgrades to Bell’s infrastructure and/or had no direct access to the telephone system due to their extreme remoteness and small size.

The provision of satellite infrastructure was critical in bringing these First Nations online, and it depended on the viability of a not-for-profit service contract. The solution emerged through an opportune moment that KO capitalized on while working in 2000 on a satellite solution for its member First Nation of Fort Severn, Ontario’s northernmost community. K-Net had just been awarded demonstration project status with Industry Canada’s Smart Communities and KO now had a relatively substantial purse to invest in telecommunications and computer infrastructure for its six member communities (Ramírez et al. 2003). Bell and Telesat (which Bell owned at the time) were working with KO on a series of satellite trials for Fort Severn. However, the devised solution proved to be unaffordable if undertaken through Bell’s commercial line (Fiser and Clement 2007). Although KO had no hope for a commercial satellite solution, Telesat’s R&D department, impressed by how K-Net Services’ technicians managed Fort Severn’s satellite solution, intervened and allowed the network to continue to experiment with a portion of the R&D transponder on a trial basis.
Then in 2001, Telesat made a game-changing deal with Industry Canada. In exchange for orbital space, it would reserve 30 Mhz, or one transponder, on its Anik E satellite for public benefits, to be determined by Industry Canada. Noticing that Industry Canada had no immediate plans for the public benefits transponder, Telesat’s vice-president Paul Bush, knowing of K-Net’s reputation, contacted KO’s Brian Beaton, now K-Net Services Coordinator, to inform him of a possible not-for-profit solution for remote First Nations to gain improved satellite access. With federal support from FedNor, SchoolNet, and the management team at the Smart Communities program, as well as private support from Telesat R&D, KO then lobbied Industry Canada’s Spectrum division to dedicate a portion of the public benefits resource to K-Net’s underserved First Nations partners (Fiser and Clement 2007). What apparently secured the deal was an audience (at the deputy minister’s level of Industry Canada) that appreciated K-Net’s achievements and approach to local infrastructure ownership and control, largely informed by KO’s direct participation in the family of mid-to-late 1990s’ Industry Canada programs.

Though it worked in collaboration with Industry Canada and Telesat, the organizations responsible for Anik E’s Public Benefits, KO proved that it could manage its portion of the satellite resource. K-Net Services became the satellite network manager and implemented a protocol to dynamically allocate about 15 Mhz of public benefits bandwidth for broadband e-services in eleven First Nations communities. That translated to approximately 780 kbps for each POP, but under the protocol this could be augmented to bursts of up to 2 Mbps concentrated in any one POP to support video conferencing and telemedicine.

K-Net’s acquisition of the satellite resource had broader socio-political and economic linkages, as it augmented the organization’s goal to extend and share the public benefits of broadband (that is, bandwidth) with Aboriginal groups throughout and beyond northern Ontario, thus creating a stronger interregional network of communities upon which to establish further public sector innovation and investment. Other groups became interested by the public benefits project and lobbied Industry Canada for a portion of the transponder. The Northwest Territories and Nunavut took their portions in 2002, leaving KO with 15 Mhz, and chose not to work with K-Net and pool their resources under its co-operative scheme.

In 2004, an additional transponder was allocated to the public benefits project and KO convinced the Kativik Regional Government of northern Québec and Keewatin Tribal Council of northern Manitoba to pool their allocated resources with K-Net Services, thus creating 30 Mhz of shared bandwidth. Then in 2007, K-Net and its Québec and Manitoba partners received additional transponder space through the federal National Satellite Initiative, thus...
creating a shared resource of 90 Mhz, which dramatically expanded the range of broadband applications that these satellite communities can develop. Presently, their not-for-profit partnership has configured the shared resource into voice, video, and data applications that each of the partner networks manages independently to serve their respective regions and communities (Fiser 2010).

Throughout K-Net’s historical evolution, what appears consistent is the role of local technical knowledge and endogenous capability as empowerments of community level interests and bridges to the interests and standards of external partners. From a project investment standpoint, local knowledge and endogenous technical capability, both within K-Net Services and in First Nations partners, help to convince external investors that decentralized community ownership of systems is feasible, reliable, and cost effective compared to more centralized technology solutions. From a community development standpoint, these empowerments represent critical investments in local human resources that enable individual community members to take up and apply the tools of their local networks and the Internet. K-Net Services staff has called their strategy to seed these empowerments “walking the talk.” In building the network, they demonstrate that First Nations partners can participate in local ownership and control. It is a recurring perspective among several CRACIN case study partners. As Gurstein explains in chapter 2 of this volume, the focus on matters of local knowledge and endogenous technical capability strategically shifts the problem of community networking from issues of simple access across digital divides to more complicated (yet substantial) issues of effective ICT use. Gurstein succinctly pinpoints the overarching goal of this perspective as “how to manage and control the tools and opportunities presented by ICTs to realize meaningful benefits for individuals and communities both distant geographically and culturally from the central, dominant drivers of the primary networks of which the information society in Canada is constituted” (38).

Moreover, as with the satellite network management case, K-Net’s endogenous technical capability persuaded investors and the dominant commercial carriers to relinquish partial control over their regional and national systems to support not-for-profit community organizations such as Ko’s K-Net Services and its partners in Quebec and Manitoba. Without this endogenous technical capability to demonstrate K-Net’s viability in places such as Fort Severn or Cat Lake, K-Net Services would only be left with advocacy tactics. As we have seen earlier, the Northern Ontario Telecommunications Working Group had undertaken to lobby for ICTs with mixed results in the telecom domain, having made few inroads with industry at the CRTC hearings on high-cost serving areas, but gaining local ground in terms of rallying service organizations and Aboriginal groups together. Frank Winter’s study
of the Keewatin Career Development Corporation’s struggles to survive (see chapter 16) echoes similar tensions between the community networks’ needs to develop local capabilities, their ongoing needs to secure uncertain project funding, and the pressures to maintain working ties with industry and telecom incumbents. As these forces are not necessarily aligned to benefit all parties, their resulting tension can threaten a community network’s survival.

As Wawatay had discovered in K-Net’s prehistory, technology is part of a constellation of strategic focal points. If, among those focal points, the socio-political and economic arrangements between public and private sector partners establish undesirable parameters for capital investment, the communities’ endogenous technical capabilities will be insufficient to guide technological change. Thus KO’s multi-faceted and parallel partnerships with Industry Canada enabled it to achieve a level of community network access that had seemed impossible before Connecting Canadians.

Compared to the other CRACIN case study sites of comparable age and scope, KO’s career as an Industry Canada partner appears to be an outlier. As Winter’s analysis in chapter 16 of the Keewatin Career Development Corporation suggests, community-based organizations such as KO are rarely so well positioned to ride successive waves of government funding. Similarly, as Katrina Peddle indicates in her discussion of community networking in Atlantic Canada (see chapter 15), there can be many onerous obligations attached to government funding, while stovepipe public agendas and limited program funds for community networks can seed intersectoral rivalries between potential allies. As Peddle explains, such forces may simultaneously hamper and divide community partners despite their communities’ demonstrable capacity to benefit local learning, capacity building, connectivity, and human resources development.

While K-Net’s community partners were able to work through their substantive differences and successfully navigate the federal and provincial funding landscape that was Connecting Canadians, many other community networks have succumbed to the vicissitudes of regional socio-politics and a downgraded federal ICT policy (see chapter 19 and the appendixes in this volume).

**Community Ownership and Local Loops**

The efforts of K-Net’s coalition partners led to substantial gains in local communications access, ownership, and control. For K-Net communities, ownership and control over the decentralized community network depends on access network conditions at the local loop. While local loop options from the incumbent telephone company have traditionally been copper wire, remote First Nations in Northwestern Ontario have been fortunate to have had FedNor, the NOHFC,
and other partners co-invest in local community cable and/or wireless infrastructure, which can be used to internetwork and/or distribute broadband POPs to serve multiple locations within a single community, independently of the telecom service provider that provisions backhaul. In terms of services, this arrangement can lead to structural separation. At the local loop each participating First Nations’ government or an appointed SME (small or medium-sized enterprise), such as a community cable company, can retain some measure of control over local bandwidth, and consumers (institutional, residential, etc.) do not have to individually subscribe to the ILEC, but rather may share the costs and bandwidth of a single or multiple POPs. K-Net coalition members call this their Indigenous Broadband Community Network Model.

Shared broadband becomes technically and economically feasible because, by pooling resources, consumers can support the employment and training of a community technician with additional support from KO’s K-Net Services and its public sector partners. (This funding base supports what Gurstein calls “effective use,” through the cultivation of local knowledge and endogenous technical capability: see Gurstein 2004, as well as chapter 2 in this volume.) Community support for human resources is also further augmented by investments from economic development projects such as those KO and SLAAMB undertook with First Nations throughout the 1990s. By working under a coalition structure such as K-Net’s, the communities may also take advantage of bulk rates for commodity bandwidth that KO can procure from the ILEC and other internetworked telecom service providers, on account of K-Net’s procurement of multiple POPs versus a single-buyer or single-purpose public-sector buyer (such as Health Canada). Moreover, because K-Net is an IP overlay network, which is logically separated from satellite and terrestrial carrier systems, the communities take part in community-driven IP applications that KO and K-Net First Nations support by virtue of their local knowledge, endogenous technical capabilities, and community-driven policies (Fiser and Clement 2008).

These community-driven applications include residential Internet, public video conferencing, and residential voice-over IP and IP cellular telephony, among others. These are community services managed by the First Nations government or an appointed SME, and are funded by individual consumers in each First Nation.

CONCLUSION: THE POWER OF K-NET’S COALITION

To build and maintain telecom infrastructure in the remote regions that K-Net represents, particularly in the form of backhauls and regional backbones, an ILEC such as Bell Aliant insists on subsidy from the national regulator and
public-sector interests. Yet even after public-private partnerships cover capital expenditures, the ILEC’s monopoly may still lack a viable consumer base from which to recover the ongoing costs of operation and maintenance, let alone to make a profit that will attract shareholders to a remote market. Residential subscribers, a major source of revenue for service providers in high-density markets, are not enough of a force to break the economic constraints of high-cost serving areas, whose low density is equally matched by the paucity of remote business subscribers that would normally feed innovation in higher-bandwidth applications such as video conferencing or enterprise resource planning. Remote businesses are typically SMEs, and their voice, video, and data-switching needs are significantly smaller in scale than what the sales offices of ILECs recognize or cater to in their focal urban environments. The pockets of residential and business consumers in remote regions represent diminutive sources of revenue compared to the ILEC’s urban business lines, and, as in the case of Northwestern Ontario, these consumers usually have little to no influence over how the ILEC and other large telecom service providers allocate internal resources to innovate new applications for consumers. We would advise any readers who harbour significant doubts of this fact to review the Canadian Radio-television and Telecommunications Commission’s proceedings on High-Cost Serving Areas (CRTC 1997).

As the histories of K-Net and its forebearer Wawatay have equally shown, a regional coalition of consumers that involves residents (including local SMEs), and relevant public sector organizations, can mobilize constituents to influence the monopoly ILEC’s prevailing business strategy. However, even a coalition of remote regions and local players, acting on its own, may not be enough to pay down the capital development costs that fundamental improvements to carrier infrastructure require. Regional policies and local campaigns may have to intersect with the higher-level funding circuits of federal and provincial public policy.

Consumers in remote regions (i.e., high-cost serving areas) cannot appeal to the ILEC’s profit motive. They depend on a public goods justification for telecom service. For Canada’s First Nations, such a justification requires federal support and buy-in from industry. Without acknowledgement by the various players involved in remote telecom that shared-access networks for Internet and broadband deployment can address community needs without jeopardizing industry, there is very little that can be done to include the residents of those communities. Moreover, without a strategy for infrastructure development that exceeds a profit motive for service delivery, the ongoing capital and operational costs of remote telecom will be difficult to address for the long term. In that respect, the decentralized, coalition-based approach to community networking that K-Net represents may be better
suited to operationalize service, given the unique business constraints of remote regions and the needs of their communities and regional service organizations. Such an approach does not preclude the ILEC and other private sector operators from delivering services (and recovering costs), but it places a community-oriented, not-for-profit organization such as KO at the head of an interdependent coalition of public and private partners. The private corporate sector is not necessarily diminished by the not-for-profit orientation. Indeed, our CRACIN research found that the ILEC Bell Aliant absorbed approximately 75 percent of the annual revenue generated by K-Net’s terrestrial POPS (circa 2007), notwithstanding K-Net’s arrangement of local First Nations ownership and control. This annual revenue may not impress Bell Aliant shareholders, but it does provide a dimension of social responsibility that establishes K-Net’s core sustainability of services.

From studying K-Net we have learned that a not-for-profit driver such as KO can take some of the risk away from the private sector, can improve local monitoring, operations, and maintenance, and build effective consumer demand by responsively aggregating the purchasing power of remote businesses, residential subscribers, and public sector organizations. It co-operates with large public and private sector partners without alienating more vulnerable, resource-poor residents, and nurtures individual appropriations of technology as it supports the particular service mandates of regional and federal institutions. This ability to balance multiple interests and responsibilities within a complex technical system complements a complicated socio-political environment that Dutton and other scholars have described as “ecology of games.” As Dutton, Schneider, and Vedel (2008, 21) explain, the concept of an ecology of games “emphasizes the complexity of social and political conflict within nested (public and private) decision-making processes that relate to social and technical interdependencies. Governance of the Internet can then be understood as the outcome of a variety of choices made by many different players involved in many separate but interdependent policy games or areas of activity.” We would add that “K-Net” could be substituted for “Internet” here.

In chapter 16, Frank Winter reflects on the challenge that community networking organizations face in maintaining a diverse repertoire of tactics and alliances to manage socio-political conflicts and weather extreme policy changes. Unlike community networking organizations that learn to concentrate on a narrow application area or survive off of a single source of program funding, K-Net’s coalition established a holistic, multi-faceted strategy that harnessed lessons from past campaigns and multiplied the strengths of local, regional, and federal players in education, healthcare, justice, information technology, and telecommunications, to build and sustain a network infrastructure that could serve their communities’ separate but interdependent needs.
EPILOGUE: ONLY A BEGINNING

In this chapter, we set out to explain the origins of K-Net by situating its emergence against a historical context of communications development in and around Northwestern Ontario. The similarities and differences between Wawatay in the 1970s and K-Net in the 1990s should inform practitioners and policy makers to look beyond the current hype of broadband and heed the lessons of earlier eras, such as the now out-of-vogue information highway policy and its legacy, Connecting Canadians. We believe that the new digital economy of 2010 and beyond is very much predicated on the legacies of the old economy. In terms of similarities, K-Net and Wawatay both demonstrated that geographically isolated and economically marginalized communities can unite over great distances to effectively mobilize regional policy for investment in community media. KO Tribal Council’s support of early broadband and First Nations Internet echoes Wawatay’s support of early ad hoc trail radio networks and community media in the 1970s. Both organizations trained local First Nations technicians for new professions, and enabled a regional First Nations economy around the regular management and repair of their respective communications systems. Both Wawatay and K-Net also provided alternatives to the narrowly administrative government approaches to communications that dominated the remote First Nations economies and had left residents with inadequate telecommunications options.

In different ways, Wawatay and K-Net also clearly demonstrated that regional policy by itself may not be sufficient to mobilize the capital required to move voice and/or data traffic beyond local ad hoc community networks. In Wawatay’s historical milieu, the mission to interconnect the Sioux Lookout District First Nation with facilities beyond the scope of trail radio required a public switched telephone network (PSTN). A PSTN is a substantial undertaking for any region. In remote high-cost serving areas (HCSAs), a PSTN depends upon the resources of heteronomous entities outside the purview of locally autonomous communities: in this chapter, we juxtapose community relationship building with Bell’s regional monopoly, federal public programming, and the CRTC’s national regulatory oversight.

As we see in K-Net’s historical milieu, to transform the Sioux Lookout District’s analog PSTN into a digital infrastructure capable of supporting Internet and 1.544 Mbps traffic required significant capital and partnerships. Since 1994 to 1996, when K-Net was a text-based bulletin board system connecting to First Nations communities at 14.4 baud, KO’s mission has been to establish connectivity within the parameters of local community ownership and co-operative community control because that is what the First Nations have historically wanted. Such an ethos traces back at least as far as HF trail
radio in the early 1970s, when the Wawatay Native Communications Society began to ask regional Aboriginal policy questions about locally relevant community media and communications technology. The PSTN of Wawatay’s trail radio era became the legacy analog infrastructure of K-Net’s 1990s emergence and eventual broadband deployment beyond 2000.

Throughout its historical mission, KO has always had to work with the monopoly ILEC Bell to develop its services, while striving to secure infrastructure that the First Nations could recognize as something they too owned. KO’s mission achieved a good measure of success in the 1990s, through successive iterations of development, only after the regional coalition of consumers that K-Net represents met the federal investment capability of Industry Canada, particularly through the offices of FedNor and First Nations SchoolNet. Without the co-operation of these regional and federal forces, to keep the ILEC onside there would likely have been no K-Net to speak of. In this way, K-Net and its regional and federal allies enabled the first phase of broadband deployment for remote Northwestern Ontario First Nations. But their fate has been subject to a constellation of socio-political and economic forces outside their locus of control.

The historical and institutional profile we have captured only marks the beginning of a possible broadband-enabled First Nations information society in Northwestern Ontario. In 2010, the situation was equally full of promise and uncertainty. On its technical side, K-Net’s broadband capabilities continue to develop unevenly across the network. While some terrestrially served First Nations communities and peri-urban hubs have access to 10 or even 100 Mbps POPS, many of K-Net’s remote First Nations community networks still make the most of shared bandwidth equivalent to 1.544 Mbps or less.

In 2009, advertised rates for K-Net community ISPs averaged CAD$40 per month, at 384 kbps (inbound), which is significantly above reported provincial averages for ISP offerings to Canadian First Nations residents (Fiser 2010). Moreover, without further upgrades to Bell Aliant’s PSTN, pooled and dynamically allocated bandwidth resources translate to less than 256 kbps (inbound) for residential applications, particularly during peak operations, for K-Net community services such as telemedicine or video conferencing.

Since 2009, the KO Tribal Council has been in negotiations with Bell Aliant to upgrade member POPS in the Sioux Lookout District to 10-plus Mbps. These negotiations involve prospective partnerships with FedNor, the Government of Ontario’s Northern Ontario Heritage Fund Corporation, and contributions from Bell Aliant and the First Nations. Based largely on fibre deployment, the proposed upgrades could cost as much as CAD$105 million. If such a proposal were to pass, it would significantly change access conditions for Northwestern Ontario’s First Nations, increasing shared 1.544 Mbps
or less to 10-plus Mbps. Presently, there is no clear indication that the negotiations will conclude. A decision very much depends on the fate of K-Net’s evolving public sector partnerships.

Since 2006, critical players from the 1990s and early 2000s, particularly programs within Industry Canada, have significantly declined in influence as K-Net passed its first phase of broadband deployment. What were once guiding forces in K-Net’s development, such as Industry Canada’s Community Access Program, no longer provide catalysis for next-generation innovation. The services and applications that will shape K-Net over the next ten years, beyond 2010, fall under the purview of more traditional First Nation-Federal government programming. As they were before Connecting Canadians and the 1990s’ information highway, Indian and Northern Affairs Canada (INAC) and Health Canada are the First Nations’ focal public partners for next-generation network development and core sustainability.

The broadband services that core INAC programs require are currently in a fledgling state and subject to a policy environment that is more conservative about ICT investments than was Industry Canada under Connecting Canadians (Fiser 2004). In 2006, First Nations SchoolNet became a part of INAC’s Education Branch. Since then it has received approximately one fifth of the budget it had in 2002. In 2011, First Nations SchoolNet’s mandate is up for renewal, and there is no clear indication that the program will continue to support community networks such as K-Net. Nevertheless, INAC programs are turning toward more intensive uses for data networks, resource planning, and information management services. New standards and possible partnerships are on the horizon for electronically managed fiscal transfers, First Nations identities (e.g., Indian status cards), administrative records, program performance outcomes, and more, across a spectrum of services in education, public works, and financial administration. INAC’s counterparts in Health Canada and at the Ontario Ministry of Health and Long-Term Care are similarly redefining their information communications technology (ICT) mandates, and consulting with coalition groups such as K-Net, to define standards for electronic public health records, the adequacy of telemedicine, and the secure transfer of medical information, among other critical issues in the domains of public health, medicine, and pharmacy.

The future for K-Net is therefore pregnant with possibility, and the community networking practices that the KO Tribal Council and allies inherited from Wawatay, and deepened under Connecting Canadians, will be tested anew. Though difficult to predict, there will be new pathways for Northwestern Ontario’s First Nations to navigate, with new lessons from history in store. Nevertheless, what must remain constant for the K-Net model to continue to thrive in this changing landscape of technology, policy, and investment is...
the First Nations’ participation in ownership and control of their local and regional networks. With that, the vow of determination made by Matthew Coon Come, then national chief of the Assembly of First Nations, in 2001 will continue to ring out in regions such as remote Northwestern Ontario:

We can use technology. With access to new Internet infrastructure that can be applied with the best networking capacities that are there, we can connect our communities, our hospitals, and our schools. . . . We missed the Industrial Revolution; we will not miss the information technology revolution.

(-Coon Come 2001)

NOTES
1 Readers interested in the network’s technical arrangements may refer to Fiser and Clement (2008). Readers interested in the evolution of K-Net’s organizational arrangements may refer to Fiser (2004), Fiser, Clement, and Walmark (2006), and Fiser and Clement (2007), as well as the case studies of Ramirez (2000) and Ramirez et al. (2003), which examine K-Net in terms of information communications technology for development. Finally, KO and partners have issued a number of important documents discussing the First Nations’ local goals and regional strategies for K-Net’s development. In particular, we refer readers to K-Net’s online information portal at http://knet.ca and KO’s research branch, http://research.knet.ca, and recommend the work of Beaton et al. (1999) and Rowlandson (2005).
2 This information is derived from CRACIN research interviews with former SchoolNet and INAC managers undertaken in 2004.
3 Following Bourdieu (1989), we use symbolic capital to evoke the intangible benefits (and sources of power) that accrue from a position of respect, recognized authority, leadership, and so forth.
4 The dollar amounts are based on Bell’s estimates from 1998, in response to questions from the Northern Ontario Telecommunications Working Group before the CRTC’s hearings on high-cost serving areas.
5 The first two iterations were 1994–1996, K-Net BBS, modem over Plain Old Telephone Service (POTS), and 1996–2000, K-Net BBS, DirecPC/MSAT and modem over POTS.

REFERENCES


A Historical Account of the Kuh-ke-nah Network


