The Fred-eChronicles

e-Novations
A City of Fredericton Municipal Corporation

No. 1 - The Chronicle of e-Novations & Fred-*e*Zone

FRED eZone free WiFi

THE CHALLENGE

World Class Organizations Need World Class Tools…

Prior to the early 1990's, Internet connectivity requirements were primarily limited to large institutions, but with the development of more robust distribution systems and tools, access to, and demand for connectivity began to rise in an unprecedented manner. In practice and in fact individual, corporate and regional success came to be very much influenced by the ability to adopt and participate in this new communication channel. It was at this time that the concept of the knowledge, worker, knowledge company and knowledge industry became popularized. As suppliers of connectivity struggled to keep up with insatiable demand, the concept of the Digital Divide became the common way to describe the connected "haves" and "have-nots".

At this time, Fredericton was one of the "have-not" communities. Broadband access was only available in very few areas, and even then for prices that were many times the costs of similar services in larger urban centers. For a community dependant on the ability of its professionals to export to markets outside of our area, we recognized this disadvantage had the potential not only to constrain economic growth, but it could initiate an economic decline. We also understood that this new form of connectivity was going to be a differentiator of communities in the future, and without some type of resolution we could see our best assets – our people – begin to relocate.

The impact of this situation was one that we also faced daily in our own city operations. The inability to connect 15 diverse municipal locations, and as a result the inability to adopt best of breed enterprise tools not only frustrated our staff but resulted in a higher cost base than would be the case if we could efficiently manage a distributed workforce and distributed work procedures. At the same time, other Fredericton organizations were describing to us similar frustrations. These were frustrations that were being fuelled by observing and competing against associates and competitors located in larger urban centres, who were benefiting from lower costs bases and more efficient processes.

This quickly became an economic and community development issue. In examining the successful economic development stories from around North America, we became aware that the most successful stories shared one thing in common. They were examples of communities that recognized a threat or an opportunity and took ownership of the issue themselves. Our City Council realized that waiting for existing suppliers to "save" us from the Digital Divide was not an option. Something had to be done, done quickly and done by the community itself.

This decision did leave two questions. The first was whether the City of Fredericton had the technological ability to deliver Broadband to the entire city, and the second was the political question of how a municipal government could justify entering what had been until then the domain of the private sector.

THE STRATEGY

In developing our strategy, we needed to address the two unanswered questions, that of technological ability and the political issue being whether or not this was something that the City itself could, or should be involved in. We quickly added a third question dealing with size: "Can a municipality the size of Fredericton significantly participate in or influence the development of broadband infrastructure and related services?"

As a municipal government it was clear to us that we needed to answer the political question first. While there were commercial providers of broadband in Fredericton, they were struggling to meet unprecedented demand and quite correctly they were focusing on much higher density areas to maximize their revenues so that they could continue to invest in adding capacity. It was clear to us that their plans for Fredericton were far out in the future, so any entry by the municipality into this commercial market would not threaten or damage any existing commercial operation.

Aside from a desire to not compete with existing businesses, we examined the appropriateness of trying to enter this business at all. While we would not be damaging, or competing with any existing providers at the present time, there was the question of how we justify our participation in this market when the commercial providers were ready to pursue it more aggressively. Upon reflection we decided that this was no different than the existing cases where municipalities "co-exist" with commercial providers. For example, many municipalities own and operate golf courses. All municipalities offer sports, recreation, and life style programs that are also offered by the private sector. Many municipalities own and operate electric utilities. It seemed clear to us that there was a precedent for cities delivering services that were also offered on a commercial basis by private sector participants. For us, this answered the political question.

The question of our technological ability and the scale of our operations were linked. After all we had adopted the vision of making broadband available in every part of the City and at costs equal to the best North American jurisdictions.

Clearly we needed to be certain of our ability to deliver. To address these questions we engaged the services of experts in the field. To learn more about how telecommunication organizations operated, we hired a consultant with a proven track record in the industry.

In Canada, broadband is considered to be a form of telecommunications, and as such is subject to regulation by the Canadian Radio and Telecommunications Commission (CRTC). So in addition to the normal business drivers, there is the additional regulatory dimension of the public approval process. Broadband providers are deemed to be public carriers, and as such only those firms who are licensed with may do this type of business. Municipalities in their own right do not

qualify as telecommunications companies so we needed to find a way to accommodate the existing regulatory environment. The decision was made to federally incorporate a wholly owned company, **e-Novations ComNet Inc**. This company applied for and subsequently received accreditation with the CRTC as a non-dominant telecommunications carrier. The regulatory requirement had been addressed which meant that the City of Fredericton now owned and operated a Utelco, a utility focused on building and offering business broadband services.

As previously mentioned, the City of Fredericton had its own requirement for reliable, high-speed connections to 15 sites throughout the municipality. But we found the existing product offerings from commercial providers were awkward and expensive. We knew some others had similar needs, and we suspected there were many more organizations who shared our frustration.

Public meetings and presentations confirmed that we were on the right track. Based on this new validation, we developed what we knew was a sustainable business model. We would build a fiber optic network designed to offer ultra-high speed connectivity throughout the community, passing from site to site and in effect forming a ring. Access would be granted on an annual membership basis. Thus we created the Fredericton Community Network. The City also agreed to be the first member of this Community Network.

We approached the community in order to help fund this venture. From the start this strategy was successful. The City provided e-Novations with a $65,000 loan to be repaid over a three-year period. Smartforce, an e-Learning company provided e-Novations with a $50,000 forgivable loan and BrunNet, at the time the largest independent ISP in the province, and the University of New Brunswick each agreed to prepay three years of membership fees to assist the company with its cash flow challenges. With these operating funds in place e-Novations set out to make its vision a reality.

We now needed a fiber network. We issued an RFP requesting bids to build or sell us existing network infrastructure. Group Telecom's offer was interesting. They would "rent" us a network. For a fixed amount per year, we could use an existing fiber network on our own terms, and offer members access at reasonable price points. Better yet, we could get started right away. Cautiously we proceeded and by the end of our first year, the Fredericton Community Network had 12 commercial members, many with multiple locations. But Group Telecom's network did not reach all of our potential members; in fact it did not reach all locations the City of Fredericton wanted to connect. It became increasingly obvious to us that while the "rent" option accelerated our entry, long-term sustainability could only be achieved if we owned our own fiber network.

We proceeded with our first build of fiber in 2001. Again we went to the community at large with a description of our project. We were able to leverage our intention to build this fiber extension. One other Community Network member described its requirement for dedicated fiber between two of their major sites. High-end applications required dedicated fiber to be lit at gigabit speeds. This company offered to partner in the build. Together we were able to build an initial eight kilometers of fiber to extend the Community Network.

As we suspected, the great majority of our members had one other need in common: dedicated Internet access. We were able to leverage this requirement by pooling the bandwidth need and purchasing in "bulk". In effect, in 2002 e-Novations became a commercial Internet Service Provider (ISP).

The decision was made to operate in the style of a Co-op. e-Novations purchases guaranteed dedicated access to Internet and allots it to members on that basis. What is innovative is that while members pay for guaranteed minimum bandwidth, they are welcome to access the Internet at even higher speeds, if other members are not using their entire allotment at the same time. While our Co-op strategy resulted in an immediate reduction of commercial Internet rates for members, it also established a new price point for other providers to meet. This illustrated to power of a Community Network and addressed one of our key goals – lower costs to the community.

As new members joined the network and demand for connectivity increased, it quickly became apparent that the community was better served when e-Novations owned the fiber segments used by the membership. Revenues from the member's annual subscriptions were used to pay for development of our own fiber ring. Each year e-Novations has built out fiber, and we are now at a point when we "rent" only a small portion of the network. What's more, each time we have built fiber, we have been able to leverage to build with partners needing their own dedicated dark fiber, thus reducing costs dramatically.

By mid 2002, most of the easy wins with our large institutions had been made, we had a stable fiber ring, positive cash flows, and had influenced the price point for broadband connectivity and Internet access in Fredericton. However, we were still a long way away from our vision of broadband everywhere. Like the commercial providers we were challenged by the "last mile" costs.

While access to a fiber network is desirable to larger organizations with substantial connectivity requirements, installation of fiber is still relatively expensive, especially in areas with fewer potential members. We needed a way to broaden the network with complementary communication technology. In partnership with our airport, located some 15 miles from our city: outside existing broadband coverage areas, we explored a number of alternatives.

Point to point wireless technology proved to be the answer. After some research we settled on a solution by Motorola. Canopy is Motorola's innovative wireless broadband solution. It proved to be an ideal technology for extending our advanced broadband network and services. What's more it permitted us to deploy broadband capabilities much more quickly and much less expensively throughout the community. It also seamlessly integrates with existing network systems and management tools to make extending and augmenting existing service simple and affordable.

At this point we became a victim of our own success. While e-Novations was able to build and operate the Community Network and offer Internet services to commercial customers, we were hard pressed to respond to the demand for these same services to small home offices or

residential customers. We needed a way to allow the community at large to reap the benefits of our initiatives. With this in mind, we issued an RFI looking for innovative solutions to this problem. Two organizations came forward with an offer to provide services to these markets. They would become Community Network members and offer their customers portions of their own bandwidth and Internet allotment. This ensured our goal of affordable broadband for all in Fredericton was in fact achieved.

At this time we had delivered on our vision, e-Novations had repaid its start-up loan to Fredericton's Council and satisfied the other funding requirements of its initial partners. We had essentially "created" a new business in our community and we had demonstrated to our citizens and businesses that we took our role of providers of world-class tools seriously.

This activity on the part of the municipality and its partners also produced a collateral benefit in that the existing broadband providers accelerated their deployment plans and the community has not only market placed supply, but choice as well.

The second collateral development was the recognition by the City Council that there was a new category of infrastructure that required funding in today's world – Intellectual Infrastructure. As an exporting knowledge community our professionals require the ability to compete with firms from around the world. The establishment of this infrastructure class ensures sustained funding for this initiative and those like it. The first example of the impact of this visionary position can be seen in the municipality's next Intellectual infrastructure project – the establishment of the **Fred-eZone**.

In the fall of 2003 we realized that our network formed a robust backbone we could use to further increase the connectivity and hence the productivity of our firms and citizens. They could now be connected at work and at home at broadband speeds, but what about in transit between these two points. Why couldn't we use our network to respond to the increasing need or desire to be connected all the time?

The IT and Economic Development staff presented Council with a new vision. Always connected, at high speeds, anywhere in the city and what's more – for free. Council adopted this proposition and directed staff to make it happen. Over the next two years we deployed close to 300 Wi-Fi access points throughout our downtown and business corridors. We lit our public facilities and retail malls. In short, we inventoried our high traffic areas and delivered free Wi-Fi to these areas. Rather than approach this market in a conventional way by establishing "hot spots", we overlayed hot spots to create a Wi-Fi zone.

Leveraging municipal infrastructure such as such as libraries, rinks, parking structures, water towers, traffic signals and streetlights to host Wi-Fi access points, and the City's 22-kilometer fiber optic ring as a host network, along with Motorola long distance wireless technology Fredericton now boasts omnipresent broadband service, a truly connected business community and an extensive Wi-Fi zone, which allows individuals to connect to the world free of charge.

Bandwidth at broadband speeds is provided to the Fred-eZone by e-Novations. As the ISP managing the Community Network, e-Novations makes available unused network capacity to the Wi-Fi zone. In this way the City incurs no incremental costs and consistent with our philosophy of treating this as infrastructure we do not charge users.

At the present time approximately 65% of the city has Fred-eZone coverage. From the moment a visitor arrives at our airport until they check into a hotel or on their way to a meeting, they are "in the Zone". This progressive highly visible commitment to innovation has served to ratify Fredericton's businesses decision to locate here and has identified Fredericton in general as a leading knowledge community. It has assisted the development of our not-for-profit and cultural sectors, who often are challenged by funding constraints. It has helped focus the community's understanding of the need for intellectual infrastructure and built a sense of optimism and pride in our future and our accomplishments.

THE RESULTS

In economic terms, Fredericton's delivery of ubiquitous broadband has helped to fuel the most significant growth period in its history. Over the past five years Fredericton has experienced unprecedented development activity with consecutive records for building permits issued:

2000 - $65 million
2001 - $64 million
2002 - $65 million
2003 - $80 million
2004 - $100 million

And we are on track in 2005 to match or perhaps exceed the 2004 levels. Prior to 1999 a good year was considered to be in excess of $40 million.

Similar observations can be made relative to employment growth. According to Canada Housing and Mortgage Corporation, employment is up 18% since 1999. And this growth represents an increasing share of the Provincial labour market. Fredericton has approximately 10% of the population of New Brunswick and last year according to Human Resources Development Canada, New Brunswick gained 11,000 new jobs. Fully half of those new jobs, 5,500, were in the Fredericton area. What's equally important is the fact that they are high quality jobs. Over the last 2 years, according to Statistics Canada, Average Household Income increased by 8%, well in excess of the inflation rate.

Our strategy to be active in the deployment of broadband connectivity and access to high speed Internet has resulted in significant new traditional data and telecommunication infrastructure. This is now a valuable asset that our community can leverage to enhance quality of life in Fredericton and make Fredericton based businesses and institutions more competitive.

While not the only factor in determining price, our efforts have indeed played their part. A comparison of "before and after" pricing is warranted:

	Before	**After**
Per Meg Commercial	$1,200	$300
T1 Commercial	$2,400	$450
Point to Point 100 Meg	$2,800	$250
Wi-Fi	N/A	Free

What's perhaps more important is that we have developed a new kind of infrastructure being "intellectual infrastructure". These new tools in Fredericton's tool-kit have been significant building blocks in making Fredericton an even better place to work, live and play.

Residents and businesses based in Fredericton now enjoy the availability of broadband everywhere and that at price points rivaling Canadian and American urban centers. Our universities enjoy access to fiber infrastructure, which links them to our hospital research center and our Emergency Measures Organization headquarters.

Business has been energized and made more competitive ensuring that they will continue to make Fredericton home for their business. Our efforts have sparked the development of new businesses thus contributing to our employment growth.

Fred-eZone, Fredericton's free Wi-Fi hot-zone has quickly become the envy of many other Cities in Canada, the US and, in fact throughout the world. We receive weekly calls from other Cities wanting to emulate the project.

While Fredericton enjoy the use of such an innovative infrastructure, the infrastructure contributes to our Economic Development strategy in many ways. Of course entrepreneurs are even more inclined to establish businesses here and residents are more encouraged to move here, live here and study here because of the tools available to them. Equally important is the fact that this project has reinforced Fredericton's reputation as an innovative community of leaders.