

REPORT TO MINISTRY OF  
RESEARCH SCIENCE AND  
TECHNOLOGY

Technology Participation Program

Attendance at the Global Congress on  
Community Networking in the Digital Era and  
associated visits in Canada - October 2002

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## **Purpose of the Report**

New Zealand has embarked on an ambitious program to deploy broadband technology throughout the country, especially to schools and their associated communities and has recently released a strategy document on Connected Communities. This report will assess these programs in the light of overseas best practice.

The author attended the Global Congress on Community Networking in the Digital Era, which dedicated the majority of the agenda to broadband and community networking. It also featured some of the world's best practice and latest policy and debate on these topics.

The author also visited several Canadian broadband and community networking projects after the conference and reports on these experiences.

This report will be based on the best practice examples presented at the Congress and those projects visited in Canada and will evaluate and present the relevant issues and examples and make recommendations for New Zealand's policy development on broadband and community networking.

## ***Scope and Relevance***

The Prime Minister, in the Growing an Innovative New Zealand framework, identified Information and Communications Technology (ICT) as a special focus area to maximise impact on innovation.

High-speed (Broadband) access to the technology is widely acknowledged as a key issue in unlocking innovation, as is the use of ICT in economic and social development.

Many countries have introduced aggressive Information Society and Knowledge Economy initiatives and New Zealand needs to keep abreast with our major trading partners to maintain its competitive position. In particular, the USA, Canada, the UK and Australia have launched heavily funded programs to have broadband available to every community by 2005 (and in Canada's case, Gigabit available to every Canadian by 2010).

New Zealand's Probe approach is addressing this situation, however the bandwidth goals are low in comparison to initiatives in other countries.

New Zealand is also lagging in community use of ICT. A few communities are very advanced in their thinking, but in comparison with overseas practice, the deployment is not as wide spread.

This report will look at policy initiatives that would deliver higher bandwidth and accelerate community use of ICT.

## ***Structure of the Report***

The report will be presented in four sections.

The first section will address the proceedings of the Global Congress and make recommendations on issues effecting New Zealand.

The second section will report on broadband network initiatives, policies and issues and make recommendations for the development of policy initiatives for New Zealand.

The third section will report on best practice community networking initiatives presented at the Congress and those visited in Canada and draw on those experiences to recommend policy development for New Zealand.

The fourth section will contain recommendations for the development of policy.

## **Executive Summary**

The author attended the Global Congress on Community Networking in the Digital Era in Montreal in October 2002. Representatives attended the Congress from Europe, North and South America, Australia, Asia and Africa. The agenda covered four main themes. These were: -

- The future of Community Networking, Community Empowerment through broadband initiatives, wireless, mixed media etc.
- Community Networks, Digital Cities and Territories: Towards Democratic Renewal.
- Internet Rights and the Regulation of Communication. Building Citizenship in the Information Society.
- Cultural Diversity.

The discussion regarding access to ICT focussed on the broadband issue with all representatives agreeing the widespread deployment of broadband enhanced economic, social and educational development. Note that the Congress did not directly address the enterprise/SME benefits of broadband, although these benefits were a key element of any initiative. Nor did it address community access to ICT centres as many of the presenting countries have run successful Community Technology Centre programs for several years.

There was a lot of discussion on the role of broadband as an innovation catalyst and growing anecdotal evidence suggests that a surplus of bandwidth encourages innovation.

The main reasons for deploying broadband are the typical public service delivery requirements of education, health, government services and community development.

The business cases revolve around cost savings in: -

- Existing Telco and data budgets.
- Centralised Administration.
- Travel and accommodation.
- Skills development and retention.

Economic benefit comes from: -

- Competitive businesses.
- New knowledge economy business.
- Retention of local business transactions.
- Community led Economic and Social development.

Key applications are: -

- Remote Education and virtual classrooms (with Video Conferencing).
- Telehealth (for training, record handling and remote diagnostics).
- One stop shop for government and community services, community portals.

Some of the more novel applications include: -

- Local Exchange Trading Schemes (LETS).
- GIS resource databases and decision support systems.
- Thin Client and Application Server models.
- Centralised administration for schools, hospitals and widespread local government.

The broadband infrastructure issues were well addressed and reinforced that the situation in New Zealand is typical as that in most developed countries. Incumbent providers cannot rollout broadband to all communities due to investment constraints and the charging is too high for non-commercial use.

Discussion was centred around the growing use of Community Owned broadband networks and examples of national, regional and local projects were presented. In these examples, community owned means that the community and not the incumbent operators own some on the network infrastructure.

The overall consensus was that “enough bandwidth” = “too much” and that with today’s technology, it is quite within the reach of local bodies to deploy broadband networks delivering 10Mbits to the home, 100Mbits to schools and SME’s, and Gbits to all others. All agreed that incumbent operators were unable to justify such rollouts, but they could benefit from them by utilising the cheap bandwidth they provide instead of building their own dedicated networks. The following principles were agreed as critical for such networks.

- A stand-alone organisation (usually a NFP) to manage the asset, with key players and community representation at the board level.
- The community owns some infrastructure (Ducts/rights of way, cables, electronic equipment, co-location facilities etc).
- The organisation out sources the construction and operation of the network to private industry.
- The network is open to all on equal terms.

Many parallels were made to the provision of good roads. Everyone agrees that good roads are essential to promote economic and social development and although roads are publicly funded, they are built and maintained by private industry. The Canadian Broadband Task Force states that broadband access is just as important to communities in today’s Information Society. They suggest the same governance model be used for the infrastructure and that it be open for all to use at minimal costs.

They argue that building new railway businesses (a vertically integrated business model like Telcos) is not appropriate for today's rapidly changing needs.

A typical comment was that competition should occur on the network, not for the network.

Many examples were presented from the US, Canada and Europe and the author feels such approaches would benefit New Zealand. The model is very similar to the CityLink business and in fact, many delegates were well aware of this initiative and congratulated New Zealand on being a leader in this approach.

The most discussed technology was Dark Fibre, meaning that the owner is responsible only for delivering the bandwidth. The customer is responsible to "light up" the cable with whatever technology they want, eg Gigabit Ethernet, ATM, PABX, Video Conferencing, Cellular base station feeds, ADSL DSLAM equipment etc. Fibre has the advantage that there is no practical limit to the bandwidth available. The cost of providing additional fibre at installation time is minimal, allowing for massive over-provisioning during the planning stage.

The most recent projects use a "Condominium Fibre" approach with the cable having up to 800 individual strands. The customer is allocated reserved rights for 20 years to an individual fibre (which is capable of handling all the busy hour telephone calls of the USA simultaneously), thus avoiding security and overloading issues.

Some innovative partnership examples and outcomes were presented. In one remote community of 6,000 people in South Western Canada, the Telco has just removed the last party line, there is no cell phone coverage and the local computer technology centre has two dial-up lines that deliver 9.6K and often drop out.

The Community is sponsoring a dark fibre connection, the Cable TV operator will then build the local cable network, using the cheap fibre feed, the cell phone company will install a tower giving full coverage, also using the cheap fibre feed, the community will get high speed internet access at 10 Mbit, free calls within the region using Voice Over Internet Protocol (VOIP) and video conferencing at the Technology Centre. The locals are calling this a win-win-win.

Typical install costs are quoted as NZ \$25-30,000 per building with the user owning the terminal equipment that "lights" the fibre. On going costs for customers are also reduced as all local traffic (within the network) is carried "free", e.g. interschool traffic will be free, community calls will be free (over VOIP), video conferencing between connected communities will be free.

It is estimated that there are several hundred community owned Dark Fibre projects in the world today, with several times that number under consideration. E.g. in Ontario, central Canada, over 150 schools are now connected to dark fibre, providing 10-100 Mbits service. This seems to be becoming a way to break the broadband impasse.

It should be noted that the Canadian government has recently announced a CAD \$35M per year, 3 year Broadband for Rural Communities program. To qualify, the community must not have a DSL or cable modem service.

Several Smart Community or Info City initiatives were presented and the author also visited many of these projects in Canada.

The Canadian Government has a policy that Canada will be the most connected country in the world by 2005 and has many programs in place to promote the deployment of broadband and demonstration projects to show the uses of the technology. It has funded 12 community led Smart Community projects in city, urban, rural and remote regions and First Nations communities. Each project addresses local community needs, but they do have several common elements.

- The whole community is involved through consultation and partnerships (including government, business and NFP's).
- A clear vision and plan for development of the community is in place.
- The community must raise half the funds.
- ICT (and broadband) must be used to solve community problems, but should not be the reason for the project.

A wide range of issues has been addressed by these projects, including: -

- Social development and capacity building.
- Economic development.
- Education and health service delivery.
- Improvement of remote community services.
- Combinations of all of the above.

The projects ranged from \$5M to \$13M and were designed to make a significant impact. A high priority in the projects has been to develop capacity in the community to use ICT to address local issues. Details of some of these projects are in the third section of this report.

In comparison, the European InfoCity initiative is more directed from the top down, rather than built by the community from the bottom up. Its aim is to develop applications and programs to apply to cities throughout Europe. Seven cities are involved in this program, with The Hague taking the lead role and Manchester representing the UK. The InfoCity project is funded by the EC to NZ \$12M with each city receiving an initial allocation of \$1.5M to develop local projects with schools, colleges, universities, museums, community groups and businesses.

The interesting aspect of these programs is that they have generated quite a lot of international and local interest and many communities have been inspired to commence their own projects. This is similar to the New Zealand broadband experience with the lead communities supporting those not so advanced.

This report makes several recommendations to the New Zealand Government as a result of the material presented at the Global Congress and the following visits to community networking projects. They are designed to advance policies to encourage the deployment and uptake of broadband and ICT.

## **Recommendations**

Based on the examples described above and the stated policies of the government in Innovation, Economic Development and in particular, ICT, the following recommendations are made to develop the appropriate policy to facilitate the rapid rollout and use of broadband.

- That the government investigate the seed funding of a small number of Smart Community projects as demonstration projects. This program should encourage communities to plan for major breakthroughs in economic and social development using ICT. It is recommended that a fund of \$5M be established for 5 demonstration projects with the requirement that the community must raise matching funds. Funding should be for a three year period.  
*This program would add an ICT component to community renewal programs with demonstrated benefits of cost savings, economic opportunities, better service delivery and increased innovation in communities. It would also demonstrate the benefits of communities using ICT and ensure the rapid take up of the broadband provided through project Probe*
- That the government support trials of community owned broadband networks as a follow on to the Probe Initiative to evaluate this as a viable model to deliver higher bandwidth. It is recommended that \$5M be reserved for 2 or 3 such networks, demonstrating the viability in urban, rural and remote communities. These networks should be open and deliver service to government institutions, large and small businesses and community/NFP organizations and individual homes.  
*This approach will introduce a higher level of competition for wholesale broadband services and deliver much higher bandwidth than Probe.*
- That the government support the establishment of an independent Community Networking Centre of excellence to give advice to communities on best practice use of ICT.  
*The goals of this centre could be to promote best practice, network existing projects, provide technical and business planning advice, co-ordinate research in community networks and advise government on policy issues.*
- That the government consider hosting a mini community networking conference in conjunction with the Global Community Networking Congress to be held in Melbourne in October 2003.  
*Such a conference will inspire many local community groups grappling with the scope and possibilities of ICT and give them confidence to proceed.*
- That the government, the IT sector and civil society representatives plan to attend the World Summit on the Information Society to be held by the United Nations (ITU) in Geneva in November 2003.  
*The importance of the Information Society and the Knowledge economy to New Zealand suggests that attendance at this summit is desirable.*

- That the government support partnering proposals between similar communities in New Zealand and Canada by funding travel and other expenses to establish good working relationships.  
*It is obvious that some Canadian communities are more advanced than many New Zealand initiatives, but our common Commonwealth heritage and similar cultures and legal schemes makes the transfer of knowledge and experiences easier.*
- That the government support the Next Generation Internet Initiative as a possible back haul carrier for community broadband networks.  
*Interconnect for backhaul of broadband is a critical issue for Community Networks. Many countries have regulated this service, however given the absence of such regulation in New Zealand, NGI offers an alternative backhaul, thus removing possible difficult interconnect issues.*

# **Section 1- Report on Global Congress on Community Networking in the Digital Era - Montreal, October 7-12, 2002**

## ***1.1 Report on Conference Proceedings***

The conference was conducted on four themes and this report will present the main issues and outcomes of those themes. It will also present implications for the New Zealand Government, industry and communities.

### **Theme 1: - The Future of Community Networking, Community Empowerment through Broadband Initiatives, Wireless, Mixed Media etc.**

Most presentations focussed on the need for broadband (the debate has moved on from providing access to ICT, it is now about the quality/value of the connection) and the benefits to be derived from the increased bandwidth.

The main applications discussed were public services like health and education and community development.

It was stated that for full pedagogical learning, 5MB of bandwidth is required. Similar figures were quoted for Telehealth remote diagnostic or outpatient consultation applications. Business cases for these applications are mainly based on cost savings, e.g. saving on long distance telephony with VOIP, saving on travel and accommodation costs, saving on many small data connections, savings on centralised administration and support.

Economic development was cited as a key issue, but the Congress did not focus on this aspect. (Some examples of Economic Development drivers will be discussed in the best practice examples in the third section).

Community Development Applications include: -

- Community Learning Networks (Capacity Building).
- Community Decision Information Systems (GIS resource data bases and decision support systems).
- Community Collaborative Working Systems (e.g. Video conferencing, file sharing, meta data storage and retrieval etc, all with freeware).
- Community Culture Networks (Native language support, heritage data storage, verbal/video archives etc).

There was a general consensus that broadband is a valuable tool to reinvigorate democracy from the grass roots, empowering communities with information and knowledge to take a more active role in the decisions affecting them.

It was agreed by all presenters that the combination of Economic, Social and Community Development made powerful reasons to rollout broadband quickly.

The aspect of the barriers to providing broadband was discussed at length. The discussion focussed mainly on fringe urban, rural and remote communities. (Third World country's requirements are not covered in this report as not being relevant to New Zealand broadband policy development).

The main points were: -

- Poor definitions and understanding of broadband.
- Lack of applications and support for SME's and communities/NFP's.
- Fragmented (and suppressed) demand in regional communities.
- Poor value proposition for SME's and communities (40% of internet traffic is peer to peer file sharing (e.g. Napster) with little or no commercial value to the user or the network operators).
- Bad early experiences for operators and users.

Cost of the service to SMEs and NFP's was raised as a critical issue. Many cannot justify the ongoing costs, but also fail to critically evaluate the benefits.

Dark fibre was presented as addressing many of these issues. It can provide a cheap connection rate, but more importantly, local traffic can be kept within the network and so be carried "free". Only traffic that leaves the network is charged at commercial rates through the service providers at the data exchange point or POP. This approach was seen as essential for community use of ICT.

One important conclusion reached was that bandwidth, while very desirable, is not a scarce resource. With today's technology, it is within the reach for most communities to provide virtually unlimited bandwidth through dark fibre and WIFI (Wireless Fidelity or 802.11) solutions. Several community-owned broadband initiatives are delivering 10MB to the home, 100MB to schools and small businesses and 1GB to all large buildings.

It was suggested that the incumbent operators would not provide an abundance of bandwidth, as their main operating paradigm is that bandwidth is scarce and should be carefully managed by experts.

## **Conclusions on the Future of Community Networking**

The general consensus was that Community Networking (use of ICT and broadband) is an essential element in community renewal and that the tools so effectively used in the government and private sectors should be made available at reasonable costs to the NFP or Third Sector. There is good evidence that bandwidth is an innovation enabler in community development.

The experiences and opinions expressed regarding broadband seem consistent with the New Zealand experience. Many countries are more advanced than New Zealand in solving the issues, but only by 1-2 years. New Zealand did take the lead in Dark fibre networks with CityLink and ICAN, but has not followed through in widely deploying this approach. The author believes that the whole of community partnership approach taken by overseas countries and outsourcing the build and operations to private industry are critical for success of such networks and notes that CityLink and ICAN do not follow this model.

In comparison to Probe, other countries are targeting much higher bandwidth and New Zealand's policies should be developed to address provision of higher bandwidth as a priority issue. It is noted that the original intention of Probe was to develop additional stages to address higher bandwidth and wider availability. New Zealand is in danger of losing its competitiveness and innovation with relatively expensive and low bandwidth "broadband".

## **Theme 2: - Community Networks, Digital Cities and Territories: Towards Democratic Renewal**

The global Digital City/Smart Community movement was discussed with many examples presented from USA, France, UK, Canada and Australia. All are underpinned by broadband infrastructure.

The drivers for each project are different, but the common themes are: -

- Electronic delivery of Government services.
- Competitive advantage in the Knowledge Economy.
- Retention of people/skills/economic value.
- Community and capacity rebuilding.
- Improved efficiency in the NFP sector.
- Social Inclusion.

There are many models for organising each initiative, however, the general consensus was that top down initiatives seem to fail over time. The successful projects have a strong community input or ownership component, often including some infrastructure. More details will be provided in the following sections of this report.

Most initiatives have strong federal, state and local government support and funding, especially in the rural and remote areas. All take a whole of government and whole of community approach.

The community driven approach was seen as an interesting balance to globalism with communities identifying their strengths, competitive advantages and assets to keep economic activity in their community. The general feeling was that if they do not have the tools of broadband and ICT, they are powerless to defend themselves against the global corporations and governments who use these tools effectively.

A key issue is providing access to information, knowledge and local content to communities and NFP's. Many governments are encouraging the use of the technology to generate Community Learning Networks that will facilitate innovative communities in developing their own economic and social improvements.

Examples of such projects are presented in the third section of this report.

## **Conclusions on Digital Cities**

Digital City/Smart Community initiatives were highly regarded as examples of the power of ICT to enable significant changes in economic, social and educational outcomes. They stimulate similar initiatives in other communities, however each

initiative must be grounded in the local community and address local needs and issues.

The concept of community innovation and development is evolving in New Zealand and the examples that were presented could easily be adapted for use here. The Smart initiatives in Wellington, Manukau and Wairarapa are examples of leading thinking in New Zealand, however best practice overseas projects have larger scope and are multi-faceted. Many New Zealand initiatives are quite innovative and highly regarded overseas, but are generally isolated and not part of a whole of community approach.

### **Theme 3: - Internet Rights and the Regulation of Communication. Building Citizenship in the Information Society**

There was debate (often heated) on the regulation of the Internet and in particular broadband access and open networks. Recent Federal Communications Commission (FCC) rulings have been interpreted as not requiring broadband service providers (in particular Cable TV operators) to provide open access to all service providers and content. The FCC has very strict rules about telephony operators not interfering with the transmission of communications, however this principle is not being applied to broadband cable access. The sceptics believe that operators will limit or block access to competing ISPs or service providers.

The trend of commercialisation of all access and content is worrying to community groups who have few resources to purchase them. There is a strong commitment to providing low cost open access for communities to gain maximum benefit from this new technology. This sentiment was also reflected in the availability of community content. The example of a community requiring access to information on their community from the government statistician was cited. In many countries, the community will be required to pay for this information at commercial rates.

The issues of open source/free software verses proprietary commercial development and the commercialisation of Intellectual Property rights in the new Information Society were roundly debated. While these are important issues, they are outside the scope of this report.

### **Conclusion on Internet Rights**

The NFP or Third Sector can benefit greatly from the use of ICT, however they need to be vigilant to defend their rights to access to information and for this reason, it is important that New Zealand's NFP community be involved in this issue. The danger is that the NFP sector is generally under resourced and does not have time to consider such issues. The upcoming World Summit on the Information Society will be an important forum for this debate.

### **Theme 4: - Cultural Diversity**

Due to the pressures of time and concurrent presentations, the participant did not attend any of these sessions.

It was noted that Robyn Kamira from Auckland attended the conference (Robyn is a member of the Maori Internet Society) and that she is a strong advocate for the representation of aboriginal groups in shaping ICT policies and practices.

## **1.2 Opportunities for New Zealand**

### **The Next Global Congress of Community Networking**

The next Congress will be held in Melbourne, October 2003 and this presents an excellent opportunity for New Zealand to showcase some of its leading innovations, but also for practitioners to be inspired by international best practice.

It will be beyond the reach of many community-networking practitioners to attend this congress, so it is recommended that New Zealand host a mini-conference (pre or post the Congress) and target a number of international representatives to attend. This approach has been suggested to the organisers and several potential attendees and has been viewed very favourably.

### **World Summit on the Information Society**

The United Nations, through the International Telecommunications Union (ITU), is hosting a world summit on the information Society in Geneva, November 2003. (see the web site <http://www.itu.int/wsis/>). The New Zealand Government is entitled to attend and for the first time, civil society and the IT industry are invited to attend this United Nations Summit.

Preparations for this summit are already under way in the global community. The Global Congress for Community Networking was, in part, preparing for the civil society input to the Summit.

New Zealand should consider its involvement and commit resources to attending this important event.

### **Community Informatics**

Community Informatics is a new academic discipline researching the impacts of ICT in communities. A consortium of leading academic bodies is being formed to promote this field of study and develop appropriate curriculum and resources.

Many of the consortium members were present at the congress and progressed the forming of the group.

New Zealand has leading research in this field and should become involved in this consortium. Professor Wall Taylor from the Central Queensland University and Professor Michael Gurstein from the New Jersey Institute of Technology are leaders in this forum and the author has maintained contact with them and indicated that New Zealand academia is keen to participate.

## Section 2 – Report on Broadband Networks

Broadband is considered as a necessary infrastructure for countries, cities and communities to fully participate in the Information Society. It has also been strongly linked to Innovation and the Knowledge Economy. Most industrialised countries have strategies and policies to encourage the deployment of broadband and many are now finding appropriate business models to roll out broadband, especially in outer urban, rural and remote areas.

Some approaches were very similar to the Probe and Otago/Tarakani approaches, using various forms of aggregation and incumbent operators to reach out beyond the normal commercial constraints of the operators.

These examples will not be explored further in this report as it is considered this approach is well understood in New Zealand and no new issues were raised.

Other broadband initiatives have been run by existing network operators as broadband demonstration or trial approaches, but all have been heavily subsidised and are not sustainable. Examples include Fibre to the Home by Telcos, Satellite to whole communities, Cellular and other Wireless in the Local Loop technologies. These approaches will not be further addressed in this report.

The most discussed broadband approach was Community Owned Networks. These networks consist of four basic elements and communities choose to invest in at least one of these: -

- The right of way (or duct).
- The transmission medium (often fibre).
- The data exchange point (or POP or Multi Service Access Point).
- The co-location facilities (shared equipment rooms).

There is an excellent paper on Telecommunications for Neighbourhoods and communities looking at the four key areas of investment. This is at the Blacksburg Electronic Village website.

*(Blacksburg Electronic Village,*  
<[http://www.bev.net/about/research/digital\\_library/docs/comm\\_tel.pdf](http://www.bev.net/about/research/digital_library/docs/comm_tel.pdf)>, Nov 2002)

There is also a step-by-step planning guide for communities to plan their community network.

*(Blacksburg Electronic Village,*  
<[http://www.bev.net/about/research/digital\\_library/docs/cn\\_guide.pdf](http://www.bev.net/about/research/digital_library/docs/cn_guide.pdf)>, Nov 2002)

Common attributes of these projects include: -

- Community wide commitment to a vision of economic and social improvement using ICT.
- Partnerships between government, business and the community (NFP's)
- A separate organisation to “own” and be responsible for the network with stakeholders being in control at the board level.

- An open network in which all players have equal access (service providers, Telco's, Cableco's, Utility providers, Local councils, businesses, schools, hospitals, universities, research organizations and community groups). The open access for services is provided through a data exchange point or POP. (E.g. Wellington Internet exchange, WIX).

An essential element in all open networks is the data exchange point. The placement of this node is an important engineering consideration to minimise traffic costs, but it also is an important element for competition as it is the point where service providers (ISP's, Telco's etc) enter the network. Many community owned networks use this point to provide web enabled customer management programs to enable customers to freely select/change service providers, thus keeping competition healthy (at the service provider level).

The following typical comments about the need for community owned broadband networks were taken from the projects visited.

“We can do this now and provide leadership and competitive advantage, or do it in 5 years time because we have to.”

“We need this to provide competitive advantage to our small businesses to allow them to network and compete in the global knowledge economy.”

“We will get a payback in 3 years just from the savings in our Telco bill.”

“Our rural communities have just come off party lines, have no cable TV and no cell phone coverage. This network will allow high speed voice and data, the Cable TV operator to provide service and the mobile operator to put up a cell site.”

“The Telco finds it very hard to deliver a quality service to each customer in our rural community. They are happy for us to take this over and for them to supply the aggregated connection to the rest of the world.”

“ We needed to do this to improve our quality of education and health services.”

“The Telco had lots of bandwidth going through our community, but we could not get access to it.”

## **2.1 Technology**

### **Dark Fiber**

The most talked about approach was community owned Dark Fibre. These networks are not engineered as cable or telephony networks, but as “stupid networks” and are often installed and operated by private companies, but “owned” by the community. Wellington's City Link was one of the first such networks in the world.

A good summary of Dark Fibre can be found at the Canarie web site.

The ultimate dark-fibre network might be represented by the concept of a publicly-owned, publicly-administered infrastructure reaching every home and business in the country, much like the public road systems is and does. On the same analogy, the offering of services on this infrastructure would be the responsibility of individuals, public institutions and private companies.

Customer Empowered Networking is a fundamental paradigm shift in our approaches to networking. Rather than carriers and ISPs building out networks to customers, customers will build out network to carriers and ISPs. Instead of buying a managed service from a carrier, new technologies and the availability of dark fiber will allow customers to own their own fiber and extend their LAN from the home or school to the carrier or ISP of their choice.

(Canarie, *Customer Empowered Networks*,  
<<http://www.canarie.ca/advnet/cen.html>>, Nov 2002)

There were three interesting developments presented at the Congress.

#### 1. Fibre to the Home (FTTH)

The many failed attempts by telcos and cablecos to introduce Fibre to the Home were based on a vertically integrated infrastructure/service model. With today's technology and the open community network approach, there appears to be a business model to deploy fibre to the home. Details are available at the Palo Alto Fibre web site.

(Harrington, Bob and Myer, *Community Benefits of a Palo Alto Fibre to the Home Municipal Utility* <<http://www.pa-fiber.net/references/20021120-heyer-FTTH-Comm-Benefits.pdf>> Nov 2002)

The report concludes that investment in a fibre owned utility will generate returns many times greater than just what is received in subscriber revenue or access fees which the business case and business plan will be based on.

The report goes on to detail the community, institutional, social and advanced service benefits that Palo Alto receives today.

Many communities have evaluated FTTH using dark fibre and have shown that it is a viable proposition. (See the Kamloops example below).

New trenching techniques allow the "burying" of fibre in a way that is similar to the traffic light control cable in street pavement, thus reducing the cost of deployment. This is referred to as micro trenching.

#### 2. Fibre Condo

This approach draws on the condominium model for building residential apartments. A central body deploys a multithread fibre cable and leases individual fibres with a 20-year indefeasible right of use to any interested party. The user is responsible to "light up" the cable with whatever technology they want, e.g. Gigabit Ethernet, ATM, PABX, Cellular feeds etc. Typical cost is NZD \$25-30,000 (one time for 20 years) per institution/building.

More details are available from the presentation by Bill St Arnaud from Canarie.

(Corporation for Education Network Initiatives in California,  
<<http://www.cenic.org/Workshops/NGI/09October02/Presos/StArnaud.pdf>>, Dec 2002)

Some communities choose to deploy multi fibre ducts and help users “blow in” their own fibre when required. This approach is favoured in new developments, but is worthy of consideration if the street is going to be dug up several times.

### 3. Gigabit Ethernet over fibre (GEF)

This approach is based on the quote that “enough bandwidth” = “too much” and is based on the fact that the incremental cost of over-providing bandwidth is relatively small.

The technology is the well-proven private enterprise Ethernet using the latest version at Gigabit rates and delivered over fibre.

Many broadband policies now specify 10Mbit to the home, 100 Mbit to SME’s and small schools and Gigabit to all other points. This is easily achieved by the GEF approach. Details of GEF are available at the Canarie web site

*(Canarie, Gigabit Internet to Homes and Schools, <<http://www.canarie.ca/advnet/gitts.html>>, Nov 2002)*

## **Wireless**

There are many wireless technologies being deployed with the main distinction being the spectrum used and the grade of service delivered.

These wireless technologies have been widely studied and trialed in New Zealand and the author did not find any new issues to include in this report.

Many speakers commented that wireless should be used as a stopgap measure as it does not satisfy the “unlimited” bandwidth requirements, but is relatively cheap to deploy. They believe business cases based on wireless should have a short return on investment (2-3 years) and plans to replace the network with fibre should be considered in the initial evaluation.

## **Broadband Wireless**

These systems operate at the gigabit rate and use laser or radio propagation. Free Space Optical (FSO) is the name given to laser systems that operate over links less than 1Km at rates up to 2.5Gbits. These systems are quick and easy to install and overcome many right of way issues. They are fully compatible with fibre systems. Microwave radio broadband systems are much more mature and are available in both the licensed and unlicensed bands and include interfaces to Gigabit Ethernet systems.

Again, these technologies are well studied and understood in New Zealand.

## **2.2 Some examples of Community Owned Networks**

Community Owned Networks come in many varieties and are called several different names. Some are nation wide, such as the Next Generation Internet proposal for New Zealand; some are at the state or provincial government level and others are directed at local communities for government/business use or even local loop replacement.

## **AlbertaSupernet**

<http://www.albertasupernet.ca/>

Alberta SuperNet is a high-speed, high-capacity broadband network linking 4,700 government offices, schools, health-care facilities and libraries in 422 Alberta communities.

It's a pathway that lets the government, educators and health care workers share information and services province-wide, and faster than ever before.

But it does more than that. Telecommunications companies and Internet service providers can "piggyback" onto the Alberta SuperNet network, making it possible for service providers to offer high-speed services to areas that, until now, have been too expensive or difficult to reach.

It means that just about wherever you are in Alberta, you'll be able to reach out to the world on one of the most advanced networks around, and the rest of the world will be able to reach back.

The broadband network comprises of more than 12,000 kilometres of fibre optic and wireless connections. Primary project partners Bell and Axia SuperNet Ltd. were awarded contracts by the Government of Alberta to build and manage Alberta SuperNet.

Internet service providers (ISPs) and application service providers (ASPs) can purchase bandwidth from SuperNet in Extended Area communities at standard rates throughout the province. These service providers can then offer competitively priced high-speed network services to businesses and residences in and around the Extended Area communities.

Alberta SuperNet is designed to be self-sustaining. Revenue generated by SuperNet customers - including government offices, schools, health facilities, libraries and municipal government offices, as well as Internet service providers (ISP's) and application service providers (ASP's) - will be applied to the operation and maintenance of the network.

The provincial government will invest \$193 million over three years in this \$295 million telecommunications infrastructure project. This investment is for the construction of the network's Extended Area, which the government will own, upon completion.

Bell Canada will invest \$102 million to build the Base Area, which they will own upon completion. Any additional costs related to the construction will be the responsibility of Bell.

*(Alberta SuperNet, <<http://www.albertasupernet.ca/>>, Nov 2002)*

## **K-Net, Northern Ontario, Canada**

<http://www.knet.ca/>

Keewaytinook Okimakanak is the non-political Chiefs Council that advises and assists their member First Nations. The Chiefs of the member First Nations who form the Board of Directors direct the organization. The First Nations include Deer Lake, Fort Severn, Keewaywin, McDowell Lake, North Spirit Lake, and Poplar Hill. The community is in central northern Canada and many of these communities are so remote, they can only be reached by plane.

This community has deployed a broadband network to each of the villages with links to Toronto and Winnipeg. Each village has a gigabit Ethernet wireless LAN connecting several community buildings

The broadband network is both a strategy and an outcome. SMART services are being deployed to overcome barriers of distance and isolation, to improve community well being, enhance learning opportunities and support skills and knowledge acquisition. The Kuh-ke-nah Network is a touchstone for Keewaytinook Okimakanak First Nations and a promising means for building sustainable communities in the 21st Century.

The staff of K-Net develops and maintains the K-Net Network which includes a variety of services including video conferencing, Internet Protocol (IP) telephony, on-line forums, e-mail, and other web-based communication tools.

Other services that K-Net provides are: -

- Computer maintenance and support for the Chiefs Council and First Nations.
- Operating and managing a small computer business.
- Regional hardware and software helpdesk service for Industry Canada First Nations Schoolnet.
- Developing and facilitating computer training programs.

The main applications on this broadband network are the Telehealth and Virtual High school programs.

**KO Telehealth** uses telemedicine workstations and video conferencing to improve First Nations access to health professionals and health programming. There are 3 primary telehealth referral sites and 7 regional telehealth centres. Each regional centre is equipped with a video conferencing system, a camera and basic medical instruments. A trained medical technician is in attendance for each consultation and a technical support person is on hand. A system administrator is also responsible for scheduling appointments.

Medical practitioners also use the network for peer consultation and professional development.

Further details are available at <http://telehealth.knet.ca/index.php>

**K-Net Internet High School (KiHS)** is driven by the desire to learn at home. Rather than leaving their families and boarding in the big cities, the students are staying at

home to work. The community KiHS classroom is a space identified by community leaders. It is "wired" for Internet access, and is staffed by a trained teacher and a community computer technician. The onsite teacher teaches one of the student's subjects, although the lessons come to the students via the Internet. Other KiHS teachers in similar First Nation classrooms teach the other subjects. There are 13 "school rooms" in the program and the course is fully accredited.

Further details are available at <http://kihs.knet.ca/>

Other K-Net services include the standard email, chat, news, home page hosting, small business centres and training, technical training, native language resources, arts and crafts businesses, youth portal and a First Nations resource database.

The infrastructure consists of an IP network with satellite links to Toronto, Fort Severn, Slate Falls and Sioux Lookout and ATM/Frame relay circuits from Bell Canada to other sites. Local connectivity is over Ethernet Local Area Networks (LAN) and wireless Metropolitan Area Networks (MAN).

It should be noted that the satellite services are provided as part of a licensing deal between the operator and the government of Canada and are not at full commercial value.

This is an excellent example of a remote community using ICT to improve their social, cultural and educational outcomes. The whole of community approach with considerable consultation has resulted in major changes for the community.

This project could be used as an example of what is possible for remote Maori communities. The K-Net staff has expressed strong interest in partnering with a similar community in New Zealand.

*(K-Net, <<http://www.knet.ca/>>, Nov 2002)*

## **Kamloops**

<http://www.city.kamloops.bc.ca/technology/cfn/cfn.html>

Kamloops is a rural community of 80,000 people, approximately 3 hours drive East on the Trans Canada highway from Vancouver. It has historically been the main route connecting the West to the East and is a typical railway and natural resource rich community. Main economic activity comes from forestry, mining and agriculture.

The City of Kamloops Community Network Business Plan committee have concluded that there appears to be a sound business case for implementing a community network based on current fibre optic technology. It should reach at least the majority of the businesses in Kamloops and aim to provide services to all residents of the city.

The project will be completed in 3 stages, the first connecting the municipal, health, university and other government offices, the second connecting businesses (small and

large) and the third connecting homes. Stage one is being engineered now and stage two is starting up.

Three independent consultants have evaluated the project and they agree that the project is worthwhile and the city council has approved the plan.

#### Project overview

- Stage 1 - \$850K (city contribution \$450K), 42 buildings, 46Km, payback 5 years
- Stage 2 - \$7M, 190 Km, 10 year ROI 8.6%
- Stage 3 - \$35M, 900Km. 10 year ROI 2.5-6%

Stakeholders are the school district, regional health, regional district, the university and the city of Kamloops

The justification for the project is to facilitate a greater take up of high tech activity in the Kamloops area and to save operation and administration costs. Recent surveys have shown that the economic growth is falling behind other regions, especially those that are close to large city centres and modern infrastructure.

The City of Kamloops has identified that modern high speed network is required to help its business entrepreneurs (mostly SME's) network into the global business world to become competitive. They have also identified a number of other associated initiatives like improving venture capital, clustering and improved high tech research and education.

The city was also frustrated that while there is a surplus of bandwidth going through the city, the incumbent operators will not make it available for local use. A key step in the process was to establish an "operating company" that, after approval by the regulator, would be entitled to interconnect at prescribed rates.

*(Kamloops Community Network, <<http://www.knet.ca/>>, Nov 2002)*

## **CMON – The Columbia Mountain Open Network**

<http://www.cmon.ca/>

The Columbia Basin is a vast water catchment area that delivers large quantities of water and electricity to Canada and Northern Western USA.

The population of 170,000 is spread throughout 147 communities over an area of 200,000 square kilometres (approximately half the size of the South Island). The terrain is typically very similar to New Zealand with mountains and valleys.

The Columbia Basin Trust has been set up by the community with a CAD \$295M endowment by the provincial government from the proceeds from the water catchment scheme. The Trust is managed by the community and has a charter of community economic and social improvement. They have identified broadband as a key infrastructure issue and are proceeding to provide broadband to every community in the absence of activity by the incumbent operators.

They have established the Columbia Mountain Open Network Trust (CMON) to own and operate the network. Membership of the trust is open for all communities that will receive the benefits of the network and is by subscription of CAD \$3.50 per head of

population for each community. The Columbia Basin Trust provides seed funding and additional money will be provided by the federal and provincial government's rural broadband initiative.

It is estimated that the total cost of the core network to serve the 147 communities will be CAD\$25-30M (CAD \$159-175 per capita). The local access will be decided on a community-by-community basis, e.g. one community may decide to use the cable TV model, another ADSL and a third to build their own wireless infrastructure.

To justify the spending of government funds on building a network that competes with private industry, they have committed to making it an open network so that the incumbent service providers can purchase capacity at the same rate as the community.

One good example of how this will work is a remote community at the end of a long valley, which today has very poor service. They have just been taken off a party line system and have no cell phone coverage or cable TV.

The network will provide them with high speed voice and data service and the cellular operator will build a tower using the back haul of the network and the cable TV operator will now deploy its TV and high speed data services using the same network. The community will also gain a better health service, better education, better access to government services and the possibility to join the knowledge economy. This is described as a win-win-win.

CMON is aiming to meet the Broadband Task Force recommendations of providing 10 Mbit to small schools, libraries and health care facilities, 100 Mbit to large schools, small hospitals and larger libraries and 1Gbit to post secondary institutions and large hospitals.

*(Columbia Mountain Open Network, <<http://www.cmon.ca/>>, Nov 2002)*

## **Gold Trail Open Network Society (GTONS)**

<http://www.gtnet.ca/>

This initiative is centred on 7 small mining towns in a semi arid mountainous region two hours drive from Kamloops (Southern interior of British Columbia). The area is 15,000 square miles with 15,000 population, 37 schools, 13 First Nation communities and 18 small and remote communities.

The aim is to build an open broadband network, partnering with local cableco and telco operators, consisting of a combination of radio and fibre networks to serve the whole community. They have all the usual benefits identified, health, education, and government services, but the best benefit is shown by the example of a small community of Spenses Bridge.

A distribution of recycled computers to the Indian Band homes has resulted in a dramatic increase in the use of the four Internet dial up access lines with waits of up to four hours to log on becoming common. There has been a measurable increase in the academic achievement through the use of the Internet, however the limited availability is now discouraging use. The network will supply 10MB access, which is more than adequate for all the computers.

The centre of the network is Ashcroft, a town the size of Carterton. It is served by a 100 Mbit fibre connection to Kamloops, justified by the aggregation of all the district schools Internet access requirements on the schools network.

Ashcroft is also the main hub for a broadband wireless point to point network, linking some of the more remote communities based in inaccessible valleys.

The community of Ashcroft is now deploying dark fibre around the town to connect the 5 government offices, the Technology Centre and some SME's. These centres are served by Telus today (the equivalent of Telecom) with Frame Relay service. Telus admits the service is not profitable in Ashcroft and it is difficult to properly service these customers. Telus are happy to supply the aggregated demand for the whole community and are working closely with the Gold Country Network organisation in this roll out.

Another example of innovative partnership arrangements is demonstrated in the local cable TV company opening up its recently upgraded fibre feed into a small community in exchange for free access to the Internet Exchange in Ashcroft.

Another recent development is the awarding of a contract to GTONS to develop on line training for communities in developing, deploying and operating broadband networks. It will consist of four models covering Wireless, Cable, LANs and Fibre.

*(Gold Trail Open Network, <<http://www.gtnet.ca/>>, Nov 2002)*

## **Peace River**

There are numerous examples of wireless broadband networks, most notably in North America, ranging from individual people offering a service to their neighbourhood through to ISP's building networks for local communities.

Canada is no exception to these movements and two projects will be briefly mentioned.

Peace River Internet Society is one of many rural British Columbia communities providing high-speed Internet connection using wireless 802.11. The Peace River Internet Society, a NFP community owned ISP, builds and operates the network. Other Internet connections offered include normal dial up and ADSL (through Telus). Today they serve 4 towns with wireless and are planning to expand the service to remote areas. The author was told that they have a good community based approach, using voluntary labour to install the towers for a total of CAD \$7,000 each and have experimented with point-to-point links up to 75 Km.

A similar group exists in Valemont. They have become so expert in WIFI that they are writing management software for community use of this technology.

These, and many other community network groups in British Columbia have formed an association and meet regularly to share ideas and solve common problems. The Provincial Government supports this group with funding for annual workshops and other administration costs..

## **Other examples**

In the province of Quebec, Dark Fibre (at 100Mbit) has been deployed to 30% of all primary schools. The school boards of 30 other schools have agreed to deploy dark Fibre.

The Canadian cities of Halifax, Des Affluents, Mille Island, Laval, Brossard, Lachenaie, Mirabel, City of Quebec, Repentigny, St Eustache, Terrabone, St Laurent, Sherbrook, Linsueuil, Fedricktown, Kamloops, Sioux Lookout and Ashcroft have all committed to dark fibre projects.

## ***2.3 Ownership model***

The key issue facing most community owned networks is that of governance and ownership of the assets. It is generally agreed that community ownership of the assets is a necessary prerequisite for development of broadband and analogies to roading and water supply are often made. The debate is characterised by the comment “ let competition occur on the network, not for the network” In the roading analogy, the builder of the road does not determine what vehicles will be driven on it or how fast the vehicles travel.

The concern of public funds being used to compete with private business has been addressed by creating such networks as “open” networks, meaning that everyone can buy the service at the same rate, including incumbent Telcos and Cablecos. In fact, they are often developed in partnership with these existing operators. Canarie, the Canadian Broadband NFP, even argues that Telcos benefit by this fibre build, as DSL requires fibre feed for approximately every 250 homes. The Fibre Condo network will attract other users, which will reduce the cost to the Telco.

The Governance model most preferred is that of a stand-alone organisation, (often a NFP) that has a board of directors consisting of representatives of the founding bodies and the wider community. Care must be taken to avoid the domination by one particular group or person. Consultation and working through issues with all potential partners and beneficiaries is key to establishing a successful organisation. Typically, the establishment of such an organisation takes 1-2 years.

The construction and operation activities are mostly contracted out to existing industry players, which also weakens the argument of public funding of these activities.

A key issue raised during the visits was the availability of independent advice to communities on technology and business cases. Many communities do not trust existing providers and vendors after examples of bad advice and failed promises. They also realise that technology is moving too quickly for them to keep reliably informed.

The Columbia Basin Trust (CBT) has been resourced to provide this role. It is a trusted technology advisor to the local communities and provides business case and technology advice to help local communities understand the issues and make informed decisions.

An example of this was the small community of Briscoe in the Columbia Basin. It has a population of 60 and has just been taken off the party line system. This community

would never have the capacity to consider broadband, but with the CBT's help, they have developed a business case to justify them joining CMON.

The author believes a similar body in New Zealand would benefit regions wishing to explore the benefits of ICT.

## **2.4 Typical costs for Dark Fibre**

Canarie, the Canadian NFP set up by the government to promote the uptake of broadband, supplies the following examples of dark fibre network implementations. The costs are once off and estimated to apply for 20 years

- Des Affluents: - 70 schools, 12 municipal buildings, 200KM fibre, Project cost CAD \$1.5M, CAD \$18,000 per building.
- Mille-Isles: - 80 schools, 18 municipal buildings, 233 KMs, Project cost CAD \$2.1M, CAD \$21,400 per building.
- Laval: - 111 schools, 45 municipal buildings, 165Km, Project cost CAD 41.8M, CAD \$11,500 per building.

*(St.Arnaud, Bill, Canarie, Proc Global Congress on Community Networking, Oct 2002, Gigabit Internet to Every Canadian by 2010)*

A Canadian company, Xit Telecom, specialises in evaluating community owned broadband networks and quote CAD \$50,000 for a feasibility study and report. They have worked on the Quebec University network of 500KM, detailed design and rollout of 13 school networks totalling 1,000KM with feasibility studies of another 30 school networks for another 3,000 KM and have engineered 15 municipal networks and 5 community owned networks.

Xit say that typical payback periods are 2-5 years.

*(Menard, Francios, Proc. Global Congress on Community Networking, Montreal October 2002)*

These figures seem to be within reach for New Zealand cities and communities, however this approach has not been adopted.

Considering the relatively low cost of such initiatives and the proven business case and competitive advantage benefits, the author feels that this approach should be studied in New Zealand. A government assisted feasibility study with a suitable community would be a good step to better understand the local issues.

## **2.5 Broadband Policies and Govt Initiatives**

### **Industry Canada**

The Canadian government's Broadband Task Force has identified that 75% of the 5,984 communities (representing 22% of the population) do not have high-speed access and are unlikely to get it. They have adopted the goal of providing broadband

to every community in Canada by 2005. This is strongly linked to their innovation and knowledge economy strategies.  
(Andrew Bjerring presentation, Canadian Broadband Task Force, Industry Canada, *Broadband for Rural and Northern Canada*,  
<[http://www.broadband.ic.gc.ca/resources\\_e.asp](http://www.broadband.ic.gc.ca/resources_e.asp)>, Nov 2002)

An Industry Canada program supports the broadband goal with a CAD \$35M/yr, 3 year Rural Broadband Expansion program. This is often matched by provincial government initiatives. They have backed this funding with \$28M for e learning, \$28M for e business, \$5M for e health and \$6M for e content.

The broadband funding is managed by calling for expressions of interest from communities that have a solid business plan for developing a broadband network. The criteria for application are that the community must raise 50% of the required funds (it is possible to claim other government funds, provincial government funds and local in kind contributions) and have a partnership model with local organizations. The community must not be currently served by DSL or cable modem. Each year, the funds will be allocated to the communities with the best vision, partnerships and community support. The first round of submissions occurred in October.  
(Industry Canada, *Broadband for Rural and Northern Canada*,  
<[http://www.broadband.ic.gc.ca/index\\_e.asp](http://www.broadband.ic.gc.ca/index_e.asp)> Nov 2002)

It is interesting to compare the Canadian community driven approach and the regional approach of Probe.  
It would also be interesting to compare the Canadian model with Probe and evaluate the bandwidth per \$ outcomes.

As mentioned earlier in this report, Industry Canada has also funded 12 Smart Community demonstration projects approximately CAD \$5M each. Some examples of these projects are described later in this report.

### **Canadian Provincial Government initiatives**

Nearly every provincial government has a broadband initiative with funding. Alberta has its \$193M Supernet serving 422 communities, the Yukon is spending \$17M to serve 11 communities, Saskatchewan is spending \$21M on 366 communities, Quebec is spending \$75M on fibre condo networks for schools and communities, Nova Scotia plans to deliver broadband to 600 sites, Manitoba is rolling out a broadband network to connect all government offices and surrounding communities and Ontario has committed \$85M to develop 50 smart communities. Cost savings drive these initiatives for the provincial governments, but they also satisfy the ubiquitous broadband policy requirements.

These initiatives are on the scale of New Zealand and it would be interesting to apply the business model to New Zealand's whole of government communication requirements.

## **Other Government policies**

There is an interesting USA Policy debate on broadband and competition issues to be found at <http://www.phoenix-center.org/>

In particular, see the policy paper No12 on An Economic Exploration into the Future Industry Structure for the Last Mile in Local Telecommunications Markets.

This paper debates the network economic aspect of the vertically integrated Telco/cableco model and concludes that the economies of scale for dedicated network builds do not reach the required level for new entrants.

Additionally, they conclude that the LEC as a wholesaler has no incentive to sabotage its existing customers by offering wholesale broadband and so competition is lacking. The report introduces the concept of the ADCo or Alternative Distribution Company, which is only a wholesaler of network capacity. The report suggests this is a way to introduce competition at the local loop level. This model is very similar to the community owned open network approach.

(Phoenix Centre, <<http://www.phoenix-center.org/>>, Nov 2002)

Tony Blair in Great Britain recently announced that broadband was becoming a key issue for his government. A recent report put the UK second behind the USA on e commerce, but a sad last in the G7 countries on availability of broadband. The new policy objective is to have broadband available to every community by 2005, very similar to Canada's objective. There is even talk of broadband becoming the new Universal Service Requirement.

Australia has identified broadband as a key issue and has formed the Broadband Advisory Group. This group has yet to report to the government. (Note the report is now available at <http://www.noie.gov.au/publications/NOIE/BAG/report/index.htm> )

## **2.6 Justification of Broadband (Build it and they will come)**

There has been much debate on what communities will do when they get broadband, what applications they will use or develop and how much they will pay.

Most roll outs have been justified by building a business case based on cost savings and revenue generation with a core customer base, but in almost every community that was visited, the use of the network has been more than originally envisioned.

Each community has found innovative ways to build on the existing infrastructure to meet local needs. The key is that the resource was community owned which gave the flexibility to develop uses that they required.

When bandwidth was not seen as a limitation, communities soon find good use for it. In this way, broadband is an enabler for community innovation and development.

Some examples include: -

- Reducing communications costs and providing Video Conferencing to reduce travel and accommodation costs initially justified K-Net. Once the network

was in place, the community developed the virtual high school to address education needs, then the Telehealth application for better health services.

- The Gold Trail Open Network started as an education network but developed with local partners to provide cable TV, cell phone and government/enterprise broadband services.
- CMON plans to deploy broadband for economic and social development reasons, but has decided to develop a community resource GIS system to allow everyone access to information about their community so that they can make better decisions about their future based on information that today is not available to them.
- Calgary has a high take up of broadband, but the social service area was under-utilising the technology. Using the existing infrastructure, they are now delivering more effective and efficient social services.

## **2.7 Relevance of Canadian experience to New Zealand**

When considering the above examples in the New Zealand context, it should be noted that there are differences between the two countries. Salient differences relating to Broadband and Community Networking are listed below, with comments on the implications to New Zealand.

- Cable TV providers have the majority of broadband customers in North America and there is competition (in urban areas) for broadband connections between the Telco and Cableco. This often reduces the likelihood of broadband service being offered in marginal areas, as the potential customers have to be shared between two sets of infrastructure, making the risk too great. *This implies that competition in the local loop infrastructure may not deliver greater broadband coverage.*
- Overhead cable is not an issue to Canadians. Most Telco and Cableco cable is overhead and community owned fibre networks are often strung on poles. *Communities have reacted strongly to the Saturn overhead cables and seem to prefer to have cables buried. This may impact New Zealand business cases as trenching is more expensive, however it does reinforce the need to trench once only, not every time a new operator wants to deliver a service. Communities that are involved in the development of a broadband network will be more likely to understand the trade off between cost and aesthetics.*
- Provincial and local government have more control over education and health and are able to commit them to using community owned networks. *New Zealand will have to use the co-operative/consultative model and this may delay the process, however, it has been demonstrated that when communities work together, better results are delivered.*
- Communities can draw on federal and provincial government funding for broadband networks. *This is a key issue. Community owned networks do rely on external seed funding. In Canada, the federal, provincial and local governments see this as a critical investment in infrastructure. Probe has generated much more understanding of the issues, however government support of the community owned network model would be required to introduce it in New Zealand*

- Interconnect for Community Networks is regulated in Canada. Once a network owner is registered as a non-dominant carrier, other carriers must interconnect at prescribed rates.

*Such regulation does not exist in New Zealand and this could limit the deployment of community owned networks. It is noted that the Next Generation Internet network (NGI) could be used to provide this interconnect through its Gigapop approach.*

### **Conclusions regarding Broadband networks**

Best practice overseas is to provide broadband at 10MB to the home, 100MB to SMEs and small schools and 1GB to other institutions. The community owns elements of the infrastructure in partnership with the users and provides open access to all users. The construction and operations are outsourced to private industry.

It is generally agreed that the existing service providers cannot justify the investment in infrastructure to deliver an affordable ubiquitous broadband service and so alternative approaches need to be investigated. Project probe has used an aggregation model to gain economies of scale for deployment, however this approach is limited as the community demand for broadband cannot be determined, nor can their capacity to pay. Probe is also limited in its whole of community and whole of government approach.

An alternative approach is the development of a competitive “wholesale” broadband market through separation of the network and service elements. The incumbent operators will not drive such competition, as it requires them to cannibalise their existing customer base (Phoenix Centre Policy paper No12, Why ADCo, Why Now, <<http://www.phoenix-center.org/>>, Nov 2002).

The New Zealand NGI report recognised this as a key issue and recommended the establishment of a national open broadband network to promote R&D and commercial uses. Users of NGI will be able to choose their services from service providers or through building their own capabilities.

It appears that this approach could work at the regional and community level and this report has presented many examples of such initiatives overseas.

Critical success factors are: -

- A whole of community approach.
- A stand-alone organization governed by all players that out-sources the operations to industry.
- A trusted “independent” advisor on technical and commercial issues.
- A core of users in partnership.

The benefits of this approach are that it may tap into a new source of funds held in community trusts and stimulate communities to explore the benefits of investment in broadband infrastructure.

The risks revolve around gaining the whole of community support and establishing a governance structure that is acceptable to all. This approach will involve time to resolve these issues.

Further risks involve the establishment of an acceptable business case with the key issues being whether the fibre is run aerially or buried, the number of core users committed to use the infrastructure and the cost of interconnect. These issues should be evaluated through feasibility studies of some pilot networks.

The author believes it will become important for New Zealand to trial community owned dark fibre as a natural follow on from the project Probe. This approach is becoming quite common in overseas countries and provides considerable savings in the provision of significant bandwidth.

Overseas experience has shown that the introduction of such networks does open up competition in the market and reduces the overall cost of ICT.

### **Section 3 – Report on Info cities and Smart Communities**

A number of examples and best practice Infocity/Smart Community projects were presented at the Congress.

The attendee also visited some of these projects during his stay in Canada.

This report will present some details of these projects, their common characteristics and aspects of the organisation, goals and funding/business plans.

The definition of an Infocity/Smart Community project is taken from the Industry Canada Smart Community web site. (It should be noted that this site is a very good reference to assist communities to define, resource and run Smart Community projects).

*Smart communities are where leaders and stakeholders have formed alliances and partnerships to develop innovative ways to extract new economic and social value from electronic networks and the public Internet.*

*By way of example, smart community projects may be designed to provide new and improved network-based services and applications for: -*

- *The administration of municipal government and delivery of services to the public (e.g. social services).*
- *Business and economic development.*
- *Tourism development.*
- *Access to information, e.g. community activities and programs.*
- *Learning, training and education.*
- *Preservation of cultural heritage.*
- *Development of the arts.*
- *Eliminating unequal access by citizens to the Internet.*

*(Industry Canada, Smart Communities Broadband, <[http://smartcommunities.ic.gc.ca/documents/whatis\\_e.asp](http://smartcommunities.ic.gc.ca/documents/whatis_e.asp)>, Nov 2002)*

Industry Canada has funded 12 demonstration projects across the nation and five of these were visited during the trip. Reports on those projects are included below.

The European Commission has also funded similar Info City initiatives to demonstrate the potential of ICT to transform cities. Again, some of these are reported below.

Closer to home, Wellington City has adopted Smart Wellington as a marketing and economic development initiative, as has Manukau City and the Wairarapa community. These projects meet the above definition of Smart Communities.

The following is a quick overview of each project visited in Canada. Further details are available on the Industry Canada web site.

*(Industry Canada, Smart Communities Broadband, <[http://smartcommunities.ic.gc.ca/demoprojects/demoprojects\\_e.asp](http://smartcommunities.ic.gc.ca/demoprojects/demoprojects_e.asp)>, Nov 2002)*

### **3.1 Canadian Demonstration Projects visited**

#### **Smart Capital, Ottawa**

With its 13 major initiatives, Smart Capital is laying the foundation for a connected community that will provide an array of political, economic and social benefits for the citizens of Ottawa, the nation's capital.

Ottawa has re-engineered itself from a public service city to a very successful high-tech city attracting the majority of investment in Canada. Its IT industry is booming despite the global downturn.

The leading institution for the project is the Ottawa Centre for Research and Innovation (OCRI), a consortium of local academic, business and government bodies. They developed and administer the program.

The 13 projects include Smart Services for Business, Education, Government and Community, Smart Knowledge resources for learning communities, Smart Sites for community access and Smart Net to provide even better Internet access to businesses, students and residences and rural communities.

The Ottawa University researches this project and is producing evaluation reports.

The 13 projects are: -

- Local Government portal merging 12 separate web sites.
- The Digital Media Centre.
- Entrepreneurship Centre.
- E Business Centre.
- Capital Net, a risk capital portal.
- Smart Community Centre including e tools for community groups.
- Networking of Community Access Points (CAP) sites and expansion of the Freenet service.
- Library online.
- Edu Net connecting all schools to broadband.
- Leadership online.
- E College, an online service to help evaluate educational options.
- Technology coaches.

- Dark Fibre network.

(Industry Canada, *Smart Communities Broadband, Demonstration Projects*, <[http://smartcommunities.ic.gc.ca/demoprojects/demo\\_ontario\\_e.asp](http://smartcommunities.ic.gc.ca/demoprojects/demo_ontario_e.asp)>, Nov 2002)  
(Smart Capital, <<http://www.smartcapital.ca/index.html>>, Nov 2002)

The total value of the program is CAD\$12M, of which Industry Canada funded half and the balance coming from the City of Ottawa, the Provincial government and local business and communities. The funding is for 3 years.

The project has been very well managed and is often visited by overseas interests as an excellent example of a Smart Community. Many programs are now well-established and delivering tools and results. The rapid success is attributed to the expertise of the OCRI organisation, which brought together government, business, academia and business. It also included the Ottawa Freenet association, one of the countries strongest community network organizations.

The facilitation of the whole of community approach gave strong support and commitment to achieve rapid results. As an example of the approach, OCRI has a person who dedicates 50% of his time to working with outlying communities that do not have broadband. They work together to determine the best way to introduce broadband, often working with local cablecos and telcos, but also investigating community owned networking approaches.

## **K-Net, Ontario**

For generations, remote First Nations in north-western Ontario have been cut off from resources most Canadians take for granted: libraries, schools and medicine. At the same time, they have struggled to maintain their languages and culture, and to create employment that will keep their communities vibrant.

Today, through the Kuh-ke-nah Network (K-Net), five First Nations in the region are using information and communications technologies to turn this situation around.

A broadband network is now in place, opening the door to a host of innovative applications such as telehealth and distance education. This is a CAN \$10M project funded for 3 years with 50% of the funding coming from Industry Canada and the balance from a mixture of other government agencies and local organizations.

The communities that are serviced by the net are very remote, some having fly-in access only. Broadband is provided by satellite, fibre and wireless technologies. Sioux Lookout is a community of 5,000 people and the main centre for the network. They are now rolling out a community owned dark fibre network in the town (funded by the Economic Development council).

The First Nations Chiefs are strongly behind the drive to use ICT to improve the quality of health, education and economic development and have received many accolades for their work.

Each community now has

- A virtual high school classroom (in 13 locations).
- Telehealth clinic (3 primary telehealth referral centres and 7 regional centres).
- A Video Conferencing room.
- A smart business centre.

- Community access sites and local training and technical support.

They have also generated their own technical tutorials, language databases, arts and crafts sites, youth portals, email and chat services, news pages and VOIP service.

The K-Net organization plays a key role in working with local communities to explore their needs and developing ICT tools to assist each community. There is 6 full time staff managing the network.

The leader of the project served on the Canadian Broadband Task Force and is in constant demand to present the K-Net successes. Locally, other First Nation Bands are now following the K-Net example. The original six communities have now grown to 13.

The K-Net organization is keen to develop relationships with similar communities overseas to share information and explore possibilities. They are very interested in New Zealand and Maori communities.

There are remarkable similarities between the needs this project addresses and the issues facing the Far North and the East Cape.

*(Industry Canada, Smart Communities Broadband, Demonstration Projects, <[http://smartcommunities.ic.gc.ca/demoprojects/demo\\_aboriginal\\_e.asp](http://smartcommunities.ic.gc.ca/demoprojects/demo_aboriginal_e.asp)>, Nov 2002)*  
*(K-NET, <<http://smart.knet.on.ca/>>, Nov 2002)*

## **Smart Manitoba, Manitoba**

Until now, the benefits of the information highway have largely bypassed rural Manitoba. However, for the five rural communities that make up the Manitoba Smart Network, broadband technology now promises to open up new vistas even grander than the surrounding landscape. To put this project into a New Zealand context, it is similar to the Wairarapa and the towns of Masterton, Carterton, Greytown, Featherston and Martinborough. The cities are on the prairie of central Canada.

Manitoba's demonstration project is built on four pillars: health, education, business and government/community services. As project leaders talk up the benefits of the 10 Smart Services in the participating communities, residents are gearing up for marked improvements in their quality of life.

The basic benefit provided by this project is the savings provided by the consolidation of services across the 5 rural communities, eg centralised school administration and support, linked medical facilities, government services on line, a GIS resource data base with an e dispatch service, etc.

Other elements include business incubators, e business training, ICT development support and an online ticketing and reservations system.

This project will use the existing provincial government broadband network, but add broadband access to schools, businesses and government offices.

The project office, set up as a stand alone NFP, is manned by 5 people, four of whom specialise in one of the four pillars to facilitate the various community groups into

action. This role is seen as critical to success and the people need to be respected in the community. For example, the Education co-ordinator has been a champion of ICT use in schools and has lead many initiatives in recent years. Representatives from each of the four pillars, the local councils and community representatives govern the Trust.

The project is still in the early development stage with no real outcomes available. Historically, the six communities have “competed” with each other and time was needed to develop the trust and processes to bring the projects together. There is now good support for the work and progress is promising.

*(Industry Canada, Smart Communities, Demonstration Projects, <[http://smartcommunities.ic.gc.ca/demoprojects/demo\\_manitoba\\_e.asp](http://smartcommunities.ic.gc.ca/demoprojects/demo_manitoba_e.asp)>, Nov 2002)*  
*(Manitoba Smart Network, <<http://www.manitobasmartnetwork.ca/>>, Nov 2002)*

### **Calgary Infoport, Alberta**

Calgary is already a very “Smart City”, winning the Worlds top Intelligent Community award from the World Teleport Authority Intelligent Community Forum. Calgary was chosen for its strength in a variety of areas including widespread availability of broadband communications, a fast growing IT and telecommunications sector and its growth in technology-related employment.

There is quite a high uptake of broadband and Internet access in Calgary and so the project was directed towards those who were not accessing the benefits of ICT.

In Calgary, social service agencies struggle to meet the demands of a growing number of people at risk. Every night, vulnerable people show up at the doors of shelters and drop-in centres looking for a warm bed. When their own shelter is full, it’s never been easy for staff to know where to send needy clients.

All that is changing with the Calgary INFOPORT™ Community Empowerment Project, the city’s Smart Communities demonstration project.

The project includes a directory of community, health and social services, a city housing registry, online employment and career services for youth and a learning resources web site for unemployed.

The project’s most ambitious component involves the partners setting up an extranet to allow rapid access to information about service providers. The system will integrate the various agencies’ existing databases and records, all the while maintaining the privacy of clients and the agencies themselves. This will benefit everyone, from service providers and volunteers to individuals at risk. At the click of a button, for example, clients will get instant access to information, including one of the most basic questions of all: where can I sleep tonight?

Some early difficulties have been experienced in getting the community service organizations to accept that ICT will help their work. Many prefer the face-to-face approach, although they understand that having the information in a database will help. The co-ordination of the city housing directory has been delayed as most of the agencies preferred to use the phone and their existing networks.

Larger service organizations seemed to be more acceptable of using ICT, perhaps because of their existing in-house training capabilities.

New Zealand may not have the homeless problem of Calgary, but there are a large number of voluntary agencies delivering social services. Many are not aware of each other's existence, even though they may be addressing the same needs. A community service database with GIS referencing is a very powerful tool to ensure the best value from the community service/NFP sector.

*(Industry Canada, Smart Communities, Demonstration Projects, <[http://smartcommunities.ic.gc.ca/demoprojects/demo\\_alberta\\_e.asp](http://smartcommunities.ic.gc.ca/demoprojects/demo_alberta_e.asp)>, Nov 2002)*  
*(Connect Calgary, <<http://www.connectcalgary.ca/>>, Nov 2002)*

### **Smart Choices, Vancouver, British Columbia**

Over the next 20 years, Port Moody and Coquitlam are expected to double in size. Consequently, the region needs expanded social services and community-based businesses to help reduce traffic, create employment, increase the tax base and contribute to a vibrant social fabric.

The New Zealand equivalent is the rapidly growing outer suburbs of Auckland.

Enter SMART CHOICES. Unprecedented in scope, the SMART CHOICES demonstration project is bringing together residents, businesses and community organizations from Coquitlam and Port Moody (outer suburbs of Vancouver) to create a common vision that balances social, economic and environmental needs. By sharing resources and expertise, the partners are creating a complete, service-oriented community where people can live, work, shop and play.

The project is very ambitious and has a budget of CAD\$13M covering the 130K population.

Its 5 pillars are: -

- A community portal to cover all services in the cities.
- Learning linkages for technology training, libraries and schools.
- Safety net providing community safety information and resources.
- E community services.
- Business choices providing the Smart Community and Business Centre, aimed at bringing sophisticated e-marketing and e-commerce functions within affordable reach of the local business community.

The project is managed by a specially created NFP organization with a board consisting of key stakeholders and community representation. It has an administration budget of \$1M, including a significant communications budget. Project management is outsourced to a private IT project management firm. The business plan is for the organization to become self sufficient in 3 years.

There are 15 technical staff, one full time volunteer co-ordinator managing 50 volunteers and 6 operations staff. The project has 17 sub projects.

Yahoo is a partner to the project and is developing community e tools, the first in the world for Yahoo.

Telus (Telecom) is also a partner and is providing

- Smart Choices portal project management, professional services, implementation and integration of all application elements, working with all other Smart Choices business partners.
- Usability and user interface design for base portal developments, which will include community engagement and professional services to ensure users with community-centric experience and appeal.
- Comprehensive Geomatics solutions through TELUS GeoExplorer™ which includes numerous specialized map-based services such as community asset management, transportation, environment, community organization locator, routing services, physical assets, satellite images, education, parks & recreation, crime-mapping, statistical information, vehicle tracking.
- Delivery of the TELUS PayIt™ common payment engine to manage select transaction flows for service items and to assist in addressing sustainability needs for Smart Choices.

The project was the brainchild of the City Council, but now has wide community and business support and partnerships, including all schools, chamber of commerce, libraries and community groups. The organisers say it took over one year in consultation and promotion to get the partners on board.

Smart Choices links strongly with 7 of the community's 17 key goals for the next 10 years.

There are 16 Projects

- Community Portal/gateway to community services & events.
- Community Partner Facilitation.
- Community Access Points, Learning Linkages - Online learning, skill sharing, reference systems.
- Learning Village.
- Web Presence for All Schools.
- Teach PoMoCo.
- Beyond our Walls.
- Online Training Programs Safety Net - online prevention programs & crime info.
- Crime Mapping.
- Online Prevention Programs, eCommunity Services - IVR enabled - eRegistration and eCivic services.
- CRM & Community-Wide Payment Processing.
- eRegistration Services.
- eCivic Services, Business Choices - online services plus Business Centre, job lines.
- Community & Business Centre.
- Community Job Line.
- Community Asset Management.

(Industry Canada, *Smart Communities, Demonstration Projects*,  
<[http://smartcommunities.ic.gc.ca/demoprojects/demo\\_british\\_columbia\\_e.asp](http://smartcommunities.ic.gc.ca/demoprojects/demo_british_columbia_e.asp)>,  
Nov 2002)  
(*Smart Choices*, <<http://www.smartchoices.ca/>>, Nov 2002)

Common Attributes for all projects include: -

- Federal Government funding is only 50% of the total project. Many players make up the balance, including in kind support.
- Every project has strong partnerships between local authorities, business and community groups and is driven by a clear vision based on local needs.
- Broadband infrastructure is only a small part of the projects, but essential for success.
- Projects are run by independent NFP organizations with boards consisting of key partners and community representation. They often outsource the operations to commercial business.
- Economic Development bodies link closely with these organisations, but are not the prime driver.
- Most communities face compelling reasons to act and have a strong vision for their future, which is well understood throughout the community.

### **3.2 Other projects mentioned at the Congress**

#### **Manchester**

Manchester is one of the core partners in the 'Infocities' project, a unique European initiative which is using new information and communications technologies - telematics - to bring real economic and social benefit to local people, business and the wider community in cities and regions across Europe.

Working alongside Manchester are six other European cities - Antwerp, Barcelona, Bologna, Helsinki, Nice and The Hague, which is the lead partner co-ordinating the project. Together these seven cities are at the forefront of using these state of the art technologies to support economic regeneration and community development and to ensure that everyone benefits from the information revolution, which is happening around us. These changes - the development of an 'Information Society' - require action to be taken to ensure that new technologies create new employment and training opportunities and improve the quality of life for people and organizations living in, working in and visiting our cities.

In Manchester the Infocities project will support six specific projects, involving: -

- A showcase project with the award winning Museum of Science and Industry in Manchester, providing the public with the opportunity to try out these technologies for themselves in the Museum's new Communications Gallery and to gain access to the rich cultural heritage of museums and galleries in the region and in Europe over the Internet.
- The development of multimedia learning centres in local schools, which will provide pupils, teachers and parents with new opportunities to use these technologies and to learn new skills.

- An adult education network in partnership with the Workers Educational Association (WEA), which will provide access to technology for local community groups and voluntary organizations.
- The University of Manchester and the Manchester Metropolitan University working together to open up access to education, research and technology transfer facilities within all of the local universities through the development of the high speed communications network being developed with Norweb Communications - the G-MING network.
- Improving public access to community information through the Manchester Community Information Network (MCIN) including local libraries, advice agencies, information centres and council offices.
- The development of electronic trading services for local businesses enabling them to promote their products and services over the Internet and to have access to secure state of the art electronic commerce systems, which will in turn promote Manchester as a 'city to do business with' worldwide.

Underpinning this initiative are four supporting networks, the Manchester Education Network (a broadband fibre network owned by a consortium of universities and health organizations), the Manchester Business Network, the Manchester Multi Media Network and the Manchester Community Information Network.

The InfoCity project is mostly a top down initiative and does involve community groups. The goal is to identify and produce applications that can be used by other cities. Later stages will address community development.

(Manchester Infocities, <<http://www.infocities.g-ming.net.uk/>>, Nov 2002)

### **Blacksburg Electronic Village**

The Blacksburg Electronic Village is often quoted as the earliest example of an Infocity. In 2000, it had the highest penetration of the Internet to homes (approx 90%) and the highest uptake of broadband in the world (approx 60%). It is an initiative of the Local University, Virginia Tech and was initially started as a research project on the use and impact of the Internet.

Today, the BEV group works closely with the Town of Blacksburg, local civic groups, businesses, and individual citizens to ensure that these new communications tools are used to support the every day human activities of Blacksburg.

The goals of the project are to: -

- Continue to foster the virtual community that has been created to complement and enhance the physical community.
- Further refine the model for creating electronic communities in other towns.
- Investigate the factors that make community networks self-supporting and responsive to user needs.
- Provide support and assistance to other communities that are trying to develop healthy community networks.

(Blacksburg Electronic Village, <<http://www.bev.net/about/history.php>>, Nov 2002)

This site has a wealth of valuable resources to help communities develop online broadband e communities. It is a bit out of date on technology, but still many relevant issues and experiences. Look in the Digital Library section.

### ***Conclusions on Smart Communities/Infocity Initiatives***

Best practice for Smart Community initiatives seems to be the Canadian approach, encouraging broadly scoped long term projects addressing local needs and issues. In comparison, New Zealand communities, with a few exceptions, are running innovative but isolated one off projects. In part, this is driven by the funding mechanisms in New Zealand, which offer limited funding for relatively narrowly defined projects.

The challenge is to demonstrate the value of the best practice approach in New Zealand. In 2001, the Ministry of Education ran a series of “Digital Opportunity” projects in five selected school communities. This approach seemed to have worked and the author feels a similar approach for Smart Communities would be valuable and bridge the gap between existing initiatives and best practice. Such an approach should target those communities that will get broadband from Probe in the early stages and run on the principles established in the Connecting Communities document, in particular the partnership and co-ordination of central government assistance actions. These principles are very similar to those used in the Canadian Smart Communities program.

The lead-time to plan Smart Community projects, gather partners, consult with the community and implement the project is 1-2 years. It seems critical to engage in some high profile smart community projects as soon as possible to help communities fully utilise the broadband resources that will become available through project Probe.

Alternatives seem to be limited by the timing requirements, however actions could include government-initiated projects (top down) or to wait for communities to realise the issues and take their own actions (as some have already done). It is recognised by most community development agencies that top down approaches fail over time and that community driven projects addressing local needs deliver the best results. As indicated above, the wait and see approach is dangerous in the potential to limit the effectiveness of Probe.

It should be noted that the TUANZ National Broadband Applications Project will identify applications for home and community use of broadband, however this may not stimulate community use of ICT. This initiative will most likely develop good and relevant applications, however the experience from overseas suggests that the local community needs to be in the driving seat, addressing issues of immediate concern to them.

Benefits of the suggested approach are that a focus on whole of community use of broadband and ICT will generate opportunities for partnership, sponsorship and innovation and act as inspiration for other communities to initiate their own projects.

Risks are that the demonstration projects may fail or that the community may not reach agreement. These risks are accepted today in government supported community renewal projects and are no different because ICT and broadband are the tools of choice. It should also be noted that some leading broadband regions do understand the benefits of broadband and only need some form of encouragement to reach a whole of community approach to running ICT projects.

It should be pointed out that the lost opportunity of not promoting a more proactive approach might be quite steep in terms competitiveness in the knowledge economy and achieving the desired growth of the economy. The investments in e Government and e Commerce must be balanced by investments in e citizens and e communities.

## Section Four - Recommendations

Based on the examples described above and the stated policies of the government in Innovation, Economic Development and in particular, ICT, the following recommendations are made to develop the appropriate policy to facilitate the rapid rollout and use of broadband.

- That the government investigate the seed funding of a small number of Smart Communities as demonstration projects. This program should encourage communities to plan for major breakthroughs in economic and social development using ICT. It is recommended that a fund of \$5M be established for 5 demonstration projects with the requirement that the community raise matching funds.  
*This program would add an ICT component to community renewal programs with demonstrated benefits of cost savings, economic opportunities, better service delivery and increased innovation in communities.*
- That the government support trials of community owned broadband networks as a follow on to the Probe Initiative to evaluate this as a viable model to deliver higher bandwidth. It is recommended that \$5M be reserved for 2 or 3 such networks, demonstrating the viability in urban, rural and remote communities. These networks should be open and deliver service to government institutions, large and small businesses and community/NFP organizations and individual homes.  
*This approach will introduce a higher level of competition for wholesale broadband services and deliver much higher bandwidth than Probe.*
- That the government support the establishment of an independent Community Networking Centre of excellence to advise communities on best practice use of ICT.  
*The goals of this centre could be to promote best practice, network existing community networking projects, provide technical and business planning advice, co-ordinate research in community networks and advise government on policy issues.*

- That the government support the Next Generation Internet Initiative as a possible back haul carrier for community broadband networks.  
*Interconnect for backhaul of broadband is a critical issue for Community Networks. Many countries have regulated this service, however given the absence of such regulation in New Zealand, NGI offers an alternative backhaul, thus removing possible difficult interconnect issues.*
- That the government consider hosting a mini community networking conference in conjunction with the Global Community Networking Congress to be held in Melbourne in October 2003.  
*Such a conference will inspire many local community groups grappling with the scope and possibilities of ICT and give them confidence to proceed.*
- That the government, the IT sector and civil society representatives plan to attend the World Summit on the Information Society to be held by the United Nations (ITU) in Geneva in November 2003.  
*The importance of the Information Society and the Knowledge economy to New Zealand suggests that attendance at this summit is desirable.*
- That the government support partnering proposals between similar communities in New Zealand and Canada by funding travel and other expenses to establish good working relationships.  
*It is obvious that many Canadian communities have practical experience that would benefit New Zealand initiatives and our common Commonwealth heritage and similar cultures and regulatory schemes makes the transfer of knowledge and experiences easy.*

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