

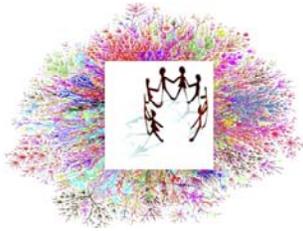
And while you have the road dug up! –

**View Royal's Vision
for a Municipally Owned**

OPEN FIBRE OPTIC NETWORK

Garth Graham, Victoria Free-Net Association (VIFA)
Showcasing Green Infrastructure Innovation in the Town of View Royal:
The New Business As Usual, September 12, 2008

Last Tuesday, September 9th, the View Royal Council decided to set up a Mayor's Task Force that could frame a strategy for the development of a fibre optic network.



View Royal's objective:

**To achieve socio-economic benefit for View Royal
from participation in the Internet economy
by growing, over time, an open fibre optic network
as a municipally owned public utility.**

Since the answer you get depends on the question you ask, the objective we might set for a municipal open network is quite significant. Here, for example, is View Royal's

Yes, that's going to mean new and additional public investment in infrastructure. But what kind of infrastructure? I hope to convince you that what's at stake is different than, perhaps, you might think. An open fibre optic network is a component of strategic capacity for greater local control of any municipality's socio-economic development. It is also a significant component of a municipality's capacity to implement its strategy for green infrastructure.

View Royal, or any municipality, is now part of a global "Internet Economy." That means it is now both local and global at the same time. And that means a significant shift is about to occur in the way that local governments and citizens think about its development. An open network lets us control what happens to the Internet in the place where we live. Municipalities everywhere are coming to the conclusion that the capacity to do that matters.

DEFINE:

- Relation of municipal networks and green infrastructure
- Internet economy
- Network as:
 1. open
 2. fibre optic
 3. municipal utility
- A Task Force to ask and answer questions



Using ICTs to reduce greenhouse gas emissions by ...

“DEMATERIALIZATION”

THROUGH THE REPLACEMENT OF “ATOMS” WITH “BITS”:

- PEOPLE GAIN DEEPER KNOWLEDGE OF SYSTEMIC IMPACTS, ALLOWING FOR BETTER DECISIONS IN SYSTEMS DESIGN AND OPERATION
- “SMART” THINGS USE EMBEDDED SYSTEMS KNOWLEDGE TO SELF-ORGANIZE

“ICTs” means “Information and Communications Technologies.” It’s part of a phrase from the world of International Development that goes, “the uses of ICTs for development” and is sometimes written as ICT4D.

It turns out that we still cannot see the upper limits of what we can achieve in terms of least cost - end use design but replacing the substance of things with embedded knowledge of what those things are.

USING ICTS TO REDUCE GREENHOUSE GAS EMISSIONS:

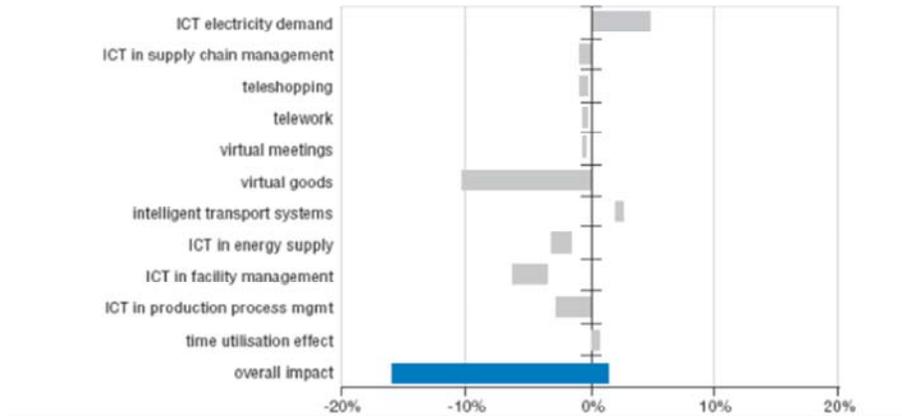
- Intelligent transport and traffic management systems
- Reducing, or substituting for, travel requirements of people and goods, such as new approaches to telecommuting
- Smart buildings
- "Demand-response" systems that give energy consumers more direct control over their energy use or that reward them for emissions reduction
- Business opportunities for researchers and corporations to deploy new economic models and create marketing opportunities where they will make profits by reducing CO₂ emissions
- ICT use in monitoring climate change
- Computer modeling of the earth's atmosphere
- Mitigating the impact of ICTs themselves on climate change

Dematerialization allows you to do the following things:



Step 3: Virtualization and De-materialization

Direct replacement of physical goods – 10% impact



Source: European Commission Joint Research Centre, "The Future Impact of ICTs on Environmental Sustainability", August 2004

CANARIE

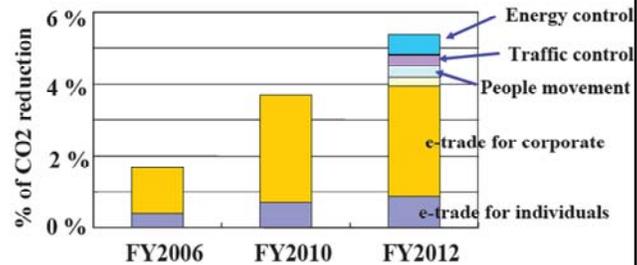
NETWORKS > COLLABORATION > RESULTS > RÉSEAUX > COLLABORATION > RÉSULTATS

Here is a graphic summary of the impact of those factors on carbon emissions done by the European Commission

ICT and Virtualization may allow us to achieve Kyoto targets

In 2012 application of ICTs to other sectors will contribute to reduction of 68 million tons of CO₂, which is equivalent to 5.4% of CO₂ emission in 1990 in Japan.

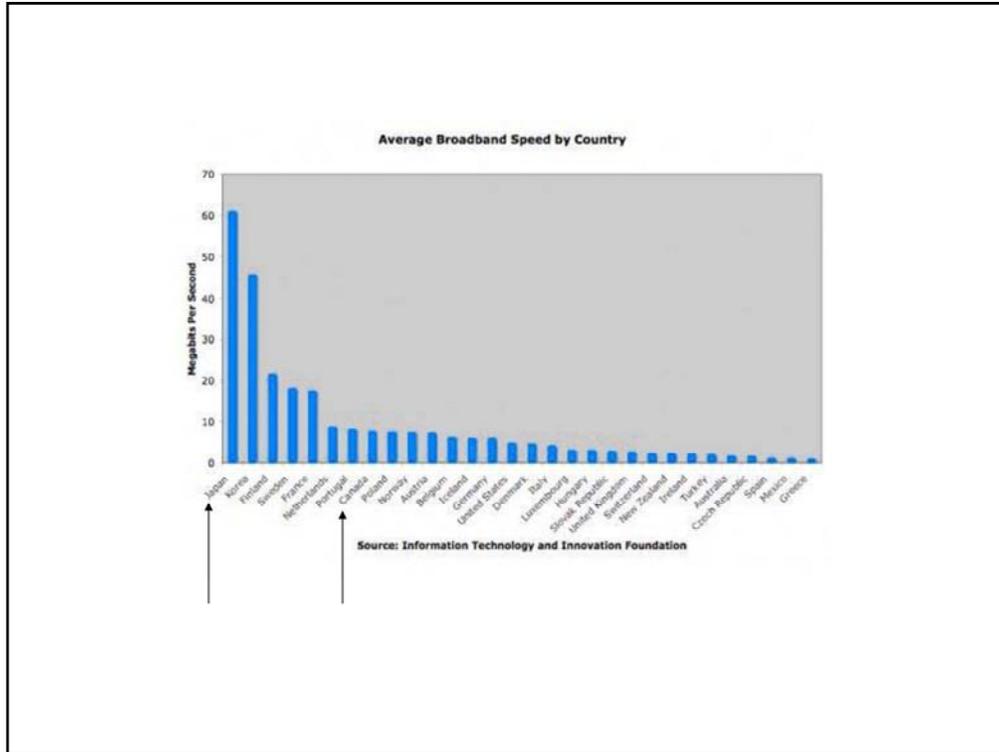
90% of Kyoto commitments by Japan



*Reference is the FY1990 according to Kyoto Protocol:
Japan expected to reduce 6%.*

Dr Yuji INOUE's presentation http://www.itu.int/dms_pub/itu-t/oth/06/0F/T060F0060080025PDFE.pdf

Japan is at the fore-front of nations considering how the uses of ICTs will support achievement of green infrastructure strategies and Kyoto target. This graph was very influential in causing them to make that decision



Here is why Japan is so confident of that outcome. At more than 60 mbs, their average broadband speed is many times faster than Canada's.

But unless municipalities step up to the plate, Canada isn't going to be able to follow Japan's example any time soon. Currently Canada doesn't have a national strategy for the uses of ICTs for development or for broadband growth. Our national and provincial politicians are convinced that "the market" is going to be able to meet this need, even though there's no evidence that's true.

The reasons for our current wheel-spinning are a consequence of not fully accepting the significance of living in an Internet Economy

INTERNET ECONOMY:

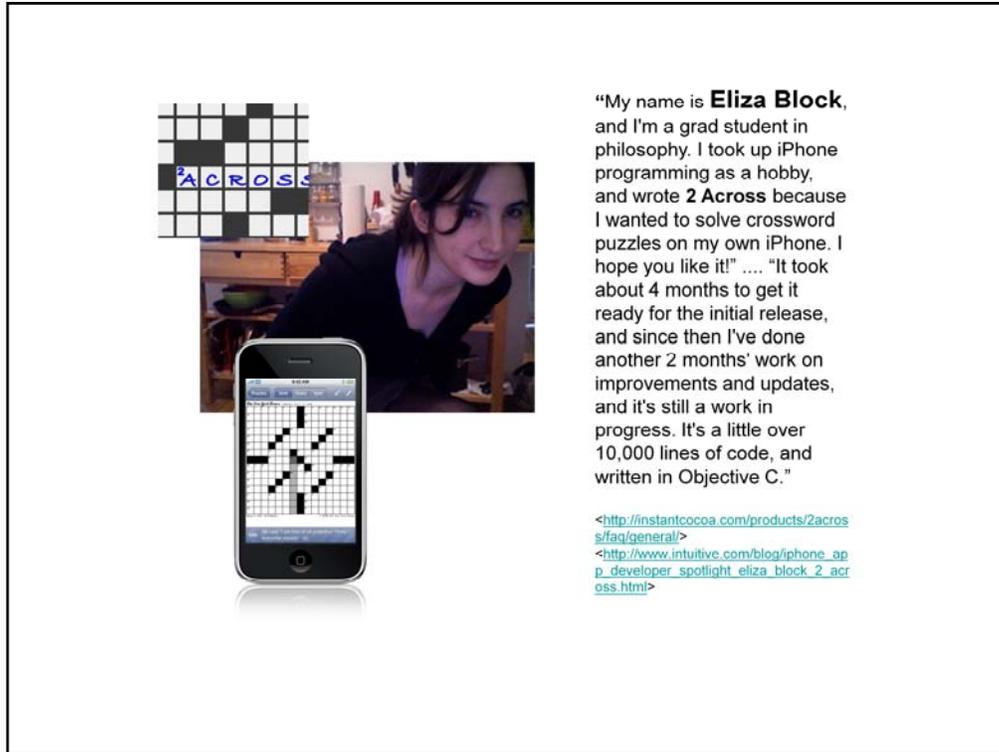


- There's no participation in our society today without Internet access.
- Easy access to cheap, fast internet services has become a facilitator of economic growth and a measure of economic performance.
- Using the Internet for development is a question of strategies for socio-economic development, not technology policy.
- You cannot build infrastructure for socio-economic development without governments being involved.

Some people still say they have little use for Internet access. They forget that the systems of services and distribution they use are Internet-based. Everyone is “online” whether they think they are or not.

There is now evidence in economic research that access to massive broadband and success in economic growth are linked directly. For the countries that “get” this link, the key difference has been the recognition that “internet use policy” isn’t a technology question, it’s a socio-economic development question.

Even to have an economic development strategy that is “market-based” as Canada does, acknowledges that stating economic development strategy is a government responsibility, not a business responsibility.



Here is an example of what a citizen does in the Internet Economy.

In June this year, Apple opened the online I-Phone applications store. Eliza Block contributed “2-Across,” software that lets you download crossword puzzles from several daily newspapers. At \$6 per copy, by the second week she was grossing \$1800 per day. If her sales stayed high, that could be \$675,000 in the first year. Now, instead of a student with loans, she’s a high end consumer in the markets of her community

If Eliza took less than one day’s revenue and set up her own server on an open network, she could sell directly and not pay 30% to Apple. If \$1800+ turned out to be consistent revenue, that would give her an extra \$197,000 in the first year. Would someone like Eliza move to View Royal for an extra \$197,000?

From where we are now, Eliza seems unusual. But, from where we are heading, she becomes quite ordinary. If we keep thinking about citizens as consumers of government services instead of producers in an Internet economy, we’re going to miss the point.

Internet economy ...

Government of Canada answer?

“... accelerate the pace of deregulation of competitive telecommunications markets and rely more on market forces to achieve Canada's economic goals.”

WRONG! ... for three reasons:

- The prime communications carriers are now free **NOT** to invest and, as a result have no real broadband plan.
- Canada is losing its “most connected” status and therefore its competitive edge.
- Canada is forgetting what it means for Internet Protocol to connect anything to anything.

You might think that this is only a national issue and that the Government of Canada is paying attention to it. It's not. Canada has abandoned all capacity to have a national strategy for the uses of information and communications for development in favour of a “market-based approach.”

Also, none of the three major political parties believe that the absence of such a strategy is a political concern.

No one else, neither senior levels of government nor corporations, are going to act to bring us the kind of broadband infrastructure that will support our engagement with the Internet economy. But we can and should do this ourselves.

Internet economy ...

"How will BCE Inc. spend money on its business following privatization? Conservatively.... Most Bell Canada customers will see broadband Internet speeds increase as the company deploys fibre optic cable to neighbourhoods **and then relies on older infrastructure to complete the last kilometre.** The company is in the middle of a \$1.2-billion project to deploy fibre to neighbourhoods. That rollout began in 2005 and should be completed by 2011. The technology, however, does not give Bell Canada the speed of its cable competitors."

Simon Avery. **BCE moves into the future – slowly.**
Globe and Mail, August 25, 2008

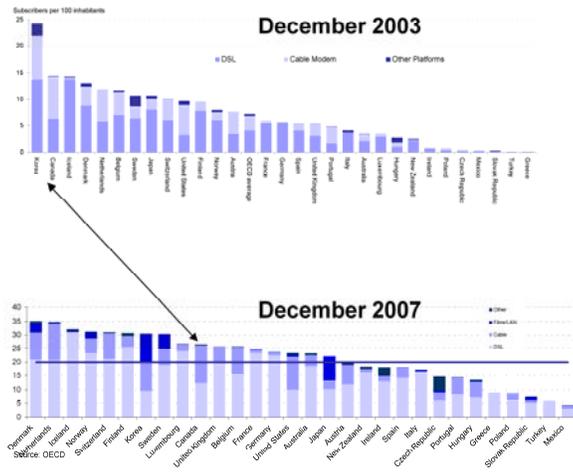
"In the firestorm around converging industries that has cable operators diving into the phone business and phone companies pushing into television, Telus remains unusually quiet about its TV efforts.... The financial investment for phone companies to upgrade their networks to handle high definition TV signals is huge. ... Like AT and T, **Telus is using the cheaper model of fibre to the node rather than to customers' homes.**"

Simon Avery. **Why Telus is keeping its TV plans under wrap.**
Globe and Mail, August 13, 2008

These two recent articles from the Globe and Mail provide evidence that the two largest telecommunications carriers in Canada have no intention of bringing real broadband anywhere near the home on any kind of discernable timetable. They also show every intention of throttling all peer-to-peer distributed applications that take advantage of the Internet's neutrality, thus killing the very qualities of Internet use that lead to innovation and economic growth.

Internet economy ...

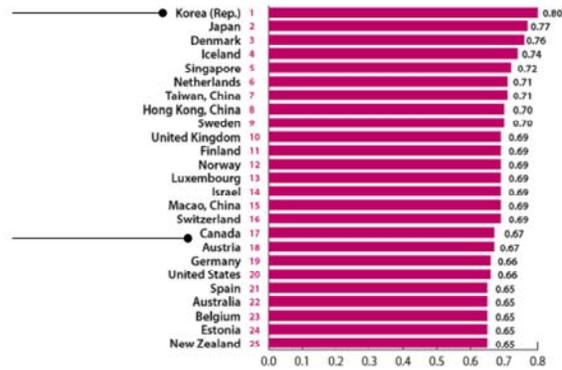
Broadband subscribers per 100 inhabitants in OECD countries, by technology



According to the OECD, in four years, Canada dropped from second “most connected” to tenth.

Internet economy ...

Digital Opportunity, Top 25 economies, 2007



In 2003, in ITU's precursor to this index, Korea was 20th and Canada was 6th

The digital opportunity index is a basket of indicators of a country's capacity to benefit from the Internet Economy.

In 4 years, Canada has gone from 6th place to 17th ... and Korea has risen from 20th place to first.

Internet economy ...



**Why Internet Protocol
is a fundamental assault
on traditional telecom methods:**

- The Internet was designed and built to carry anything digital. It will connect anything to anything. There is no primary application.
- If you can do it at the edges, don't do anything in the middle ... be as dumb as possible ... networks don't care, they just move packets.
- The end point choice is NOT an Internet decision. Everything is open, unbundled.
- The Net is resilient when facing new applicants and media. Nobody can stop you from creating a whole new industry, just like Eliza Block.

.....value lies with the people.

Network neutrality and open access definitions:

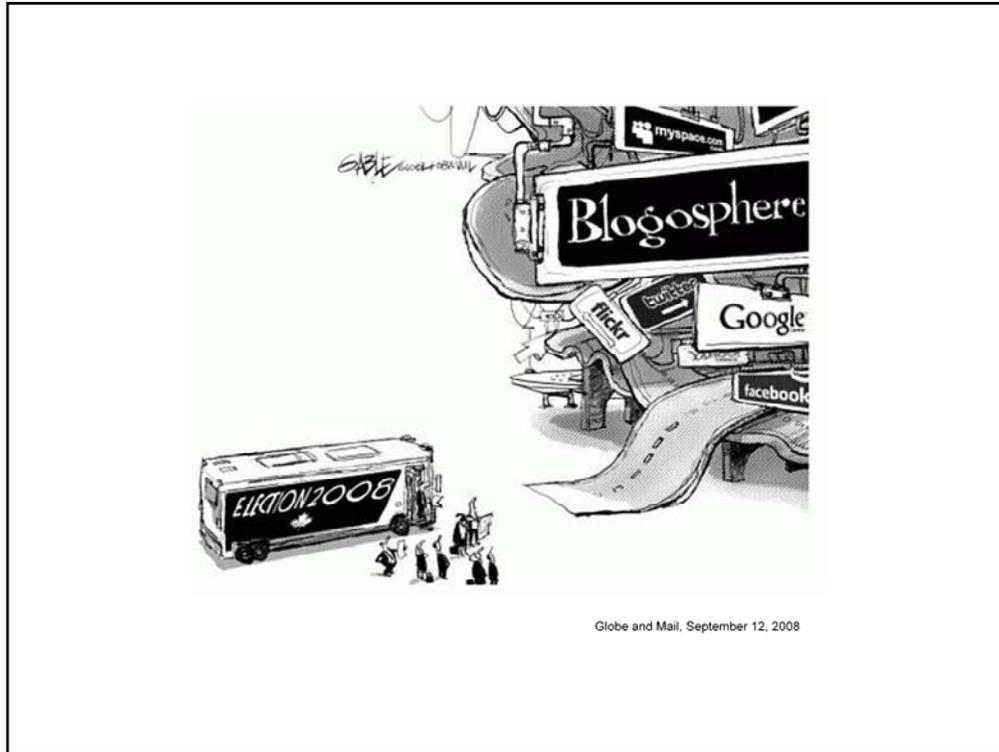
The key to creating wealth in the Internet economy is to understand what the Internet actually does and act accordingly.

Net neutrality implies a commitment to ensuring that Internet service providers treat all content and applications equally with no privileges, degrading of service or prioritization based on the content's source, ownership or destination. Technically, a neutral network treats all packets equally, and this allows for symmetric Peer-to-Peer (P2P) interaction.

An open network provides access to the network on non-discriminatory terms, thereby encouraging the entry of new service providers.

It is these two things, net neutrality and open access, that create and sustain an open market for applications and services, and give all players a level playing field.

The business cases of the prime communications carriers in Canada depend on denying their competitors a level playing field.



It isn't necessary, to imagine undue influence of big business on government to guess at why this gap in essential public policy has occurred. The Internet is forcing basic changes in the nature of governance itself. It is far easier to adapt to these at the local level. At the national level, there's a kind of automatic assumption about the necessity and efficacy of "top-down" approaches to governance. This impedes a clear view of what the Internet actually does. But local governments are too close to the people they serve to take refuge in that assumption.



open network as municipal utility

Key reasons to have an open fibre optic network as a municipally owned public utility:

1. Economic Development – a catalyst to bring more businesses to View Royal
2. Digital inclusion and universal access
3. Public Safety/Security/ Disaster Recovery – the network can assist key agencies to achieve critical objectives in coordination and harm reduction.
4. Control of methodologies and tools enabling e-government and the re-engineering of public administration
5. Re-Engineering municipal communications to enhance digital service delivery
6. Cost Savings — for View Royal, for local businesses, for residents
7. They Make Money – evidence for positive operational cash flow in the past, and forecast for the future in other jurisdictions
8. Competition – brings the benefit of a more competitive communications market for View Royal-based enterprise
9. Directly supports implementing green infrastructure strategies

These themes should all be chapters in View Royal’s strategy. Any one of them has a story far longer than the time I’ve got for this whole presentation

Economic development - There is very good evidence that access to fast, cheap and reliable broadband is a critical factor in business decisions about where to locate.

Digital inclusion - At first, we thought the “digital divide” was a technical problem that could be solved by access. But, in an Internet economy, there are still going to be people who are marginal to that economy. In fact, the degree to which the programs of social services agencies are now geared to supporting those who are excluded by an online society is astonishing. Victoria Free-Net, whose core program mandate is digital inclusion, works very closely with many of them. We are looking forward to exploring the ways in which open municipal networks can be used to address digital inclusion issues.

Competition - There is very good evidence that the existence of an open municipal network in a market region brings down the communications costs regardless of the supplier.

open network as municipal utility

CASH FLOW SOURCES:

- Low and high bandwidth subscriber fees
- Network services for local businesses
- Revenue sharing with services and content providers for access to View Royal as a market
- Sharing services of e-government platform
- Conduit access fees
- Anchor tenant cost sharing
- Advertising
- Government and institutional cost savings
- Fibre lease fees
- Negotiate fibre/conduit as amenities in projects

Again, realizing revenue from any one of these sources and others, depends on how design assumptions and decisions take the local context into account. But there are now municipalities that are realizing real revenues from their networks. There are also municipalities who are required by their laws to render their networks self-sustaining and who see no difficulty in reaching that goal.

For example, Burlington, Vermont (pop 39,000) is on schedule to have a positive free cash flow by late 2009, when its network will generate enough income to make debt payments in addition to running the network. Once they have serviced the debt, they anticipate that some 20% of the city's General Fund will come from network revenues.

A VRON TASK FORCE TO ASK AND ANSWER QUESTIONS:

- Governance model
- Exploration of operations options and risks
- Revenues and costs
- Development opportunities
- Business requirements
- Legal and regulatory implications
- Funding sources
- Policy issues for rights of way in public works and development projects
- What and where are the learning curves for the “back office” skills required?
- Next steps."

A Task Force to:

... act on the primary objective.

.... identify and begin to answer the right set of questions for View Royal.
What network characteristics are in the best interests of the citizens of View Royal?

... act on finding a “public voice” (forums?) for issues related to View Royal’s uses of the Internet for development. What are the benefits and features that might catch the voting public’s attention? What needs to be in place so that “View Royal” can think about this in an open and transparent fashion?

This is just a preliminary list of the issues that will need to be addressed while drafting a strategy for an open fibre optic network as a municipally owned public utility. As we begin to talk about this on several levels in the community, we know that other issues and concerns will surface and should be added to the list.

open network as municipal utility

OPEN NETWORK PRINCIPLES

High-speed open networks are essential public infrastructure.

Public ownership ensures that communities can:

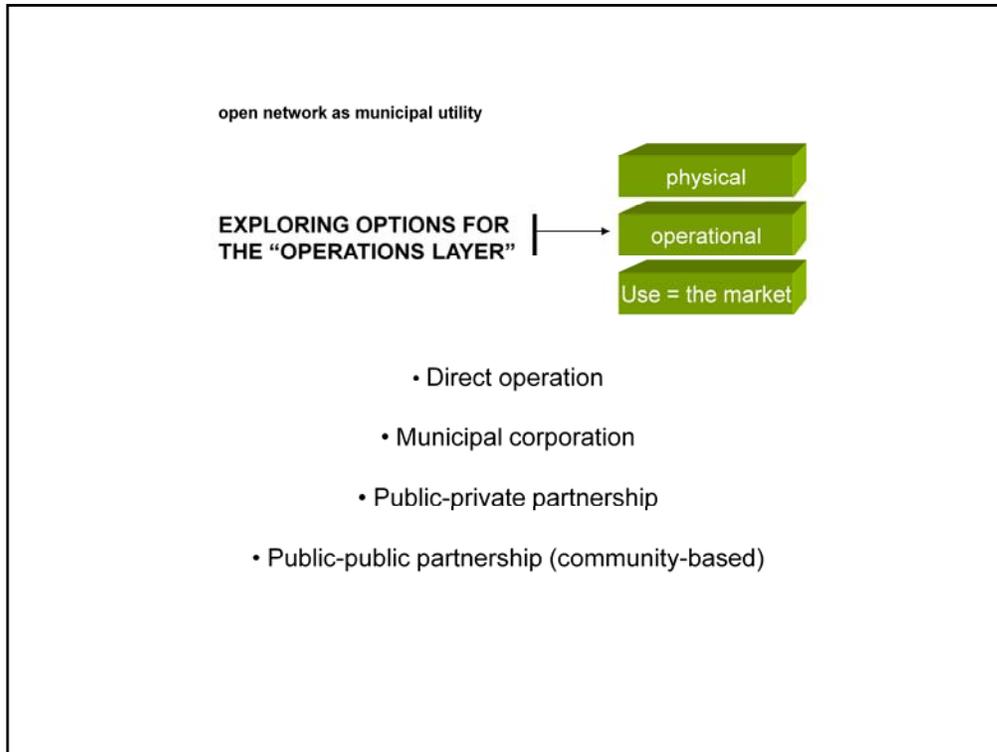
- Influence the design of their future information and communications systems
- Tap into the growing networked interactions of an Internet-based economy

.....**But!**

- **Public ownership of the physical network does not necessarily mean the city either manages the network or provides services.**

So, in summary, I've been talking about a network that implements the responsibilities of local government for the provision of infrastructure appropriate to an Internet economy.

It turns out that the questions of who owns what and who does what are critical. There are a variety of owner-operator models, and the decisions to adopt any of them have major implications for how the corresponding business case will be spelled out.



When the Internet is operated as a utility in the public interest, the market is not for the carriage of bits or "access." The real market is for the uses of what's transported on it ... for the applications or services it makes possible.

In order to ensure that the network is NEUTRAL as to transportation of bits and NON-DISCRIMINATORY with respect to use, so that new markets for services can emerge, it is useful to think of its functional structure as made up of three separate layers. It is particularly useful to ensure the separation of ownership of the physical infrastructure layer from the daily network management and operations layer. The question then becomes, given the networks' socio-economic development objective, who is the most beneficial operator?

Since this is a network in the public interest, the exploration of operational layer models should undertaken primarily from the users' perspective.

**Coquitlam Optical Network Corporation
(a city owned dark fibre commercial enterprise)**

QuickTime™ and a
TIFF (LZW) decompress
are needed to see this pict

"The rate structure and leasing arrangements are open to all service providers, and our goal is to provide the infrastructure so that they can extend and improve services in Coquitlam. At the same time, we're generating revenue for the City that is not based on property taxes." (Mayor Maxine Wilson).

Commission des Services Électriques de la Ville de Montreal



CSEVM builds, manages and operates the system of underground conduits. It shares the capital cost with all carriers and engineers additional capacity for resell. The City now has 19.2 million metres of linear conduits, covering 623 of the city's 2,123 kilometres of streets. The costs of duct rental are \$3.65 per metre."

Fred-eZone: a free wireless network provided by the City of Fredericton



Fredericton took four years to form a municipally owned non-dominate carrier company, "e-Novations," construct a fiber optic network, deploy a point to multi point wireless network, and finally, to deploy over 120 Cisco WiFi access points in the field. This was done using existing budgeted dollars by re-investing the City's telecom savings back into the network and by accepting commercial subscribers. The private sector also contributed cash and in-kind services. In 2008, Fredericton was named one of the World's Top 7 Intelligent Communities by the New York based Intelligent Community Forum. The goal of this awards program is to raise awareness of how communities have successfully driven local prosperity in the Broadband Economy. .

In total, more than 400 cities and towns in United States already have launched, or are developing, municipal broadband systems.

There are now many "explorations" ongoing in Canada, but no comprehensive inventory of them. The following examples are intended to illustrate the range of possible approaches.

Two of these are municipally-owned corporations.

Note that Montreal, while merely owning the conduit, has a rental income from 623 kilometers of street dust of \$3.65 per metre per client

Wired Community

**Kamloops
Community Network**

Our City is taking a position by building an on-ramp to this Information Highway. The **Kamloops Community Network** will be a publically owned and operated utility providing businesses and citizens with low cost, high speed communications.

Phase I This jointly funded venture connected public sector facilities, secondary schools, provincial government buildings, and the Thompson Rivers University with an open access point at City Hall. Completion Date: October 29 2006

Phase II To leverage Phase I to provide connectivity for the business community. The City has requested input from the private sector to structure how phase II might work. A survey of businesses in the downtown core and the southwest business district was conducted in November 2007. Then an RFP (P14-08) was issued in May 2008 looking for a partner to help the City realize the potential of phase II.

Phase III To extend this fibre infrastructure to residential area homes.

Note that Kamloops, while developing a true public utility as a city department, is now three years into creating KCN and still somewhere in the middle! These things take time.

Also, their back office, the IT Department, now has 6 employees and is growing.

[View Royal Open Network \(VRON\)](#)

THE LESSONS FROM EXPERIENCE SO FAR:

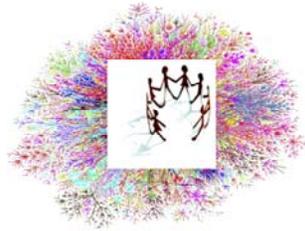


- (a). Questions of governance and ownership are more complex and risky than those of technologies**
- (b). Plan for the long-term**
- (c). In order to be future proof, go fibre**
- (d). Stay true to the Internet's original intention**

Broadband technology is now relatively well understood, and getting better and cheaper all the time. But the idea that broadband is a service in the public interest is relatively new. There is, therefore, a lot of learning going on. In benefiting from that experience, it is better to listen directly to other municipalities, NOT to prime telecommunications carriers.

In planning for the long-term, a step-by-step approach is both the best way forward and entirely possible. But (b) and (c) are actually inter-related. We can and will face a push for wireless on the basis of it being faster to implement and cheaper. In the longer term, that's not so. And there are now many examples of public-private partnership wireless projects that have failed to get implemented because the private partner backed out when they fully understood the business implications of open network operation as a utility. On the other hand, fibre is future proof.

**“At the end of the day, local governments, accountable to local citizens understand their own needs and should have the freedom to find local solutions to local problems.
..... We should not require citizens to beg big corporations to deploy systems when these citizens have the power to take matters into their own hands.”**



Connecting the Public: The Truth about Municipal Broadband.
*Consumer Federation of America, Consumers Union,
Media Access Project and Free Press, April 2005.*
http://www.freepress.net/docs/mb_white_paper.pdf

Up until recently, most people involved in public service in Canada didn't spend much time thinking about the uses of the Internet for development in terms of municipal responsibility. That is now beginning to change.

I've provided you with a sort of state-of-the-art review.... knowing what we now know about local broadband infrastructure, what should we do? I admit that there isn't another Canadian example of a municipal network that would be exactly ideal. So, in that sense, View Royal could be a first.

And a beginning has already been made. Like Montreal, View Royal is now including ducts in the ground during projects. Costs are less than 0.5% of project, and are being born willingly by developers.

When you realize that the Eliza Blocks of the world give us an advance warning of what an ordinary citizen is about to look like, it's not too soon for View Royal to have a strategy in place for using the Internet for better local control its own development.

Appendix A: Further Information on Municipal Ownership of Open Fibre Networks

Becca Vargo Daggett. **Localizing the Internet: Five Ways Public Ownership Solves the U.S. Broadband Problem.** Institute for Local Self-Reliance, January 2007. <http://www.newrules.org/info/5ways.pdf>

Andrew Cohill. **Open Service Provider Networks: An Overview.** Virginia, Design Nine, no date. http://www.1st-mile.com/resources/ospn-references/a_cohill-fiberospnoverview/view

Columbia Telecommunications Corporation. **Fiber Optics for Government and Public Broadband: A Feasibility Study.** Prepared for the City and County of San Francisco, January 2007. http://www.sfgov.org/site/uploadedfiles/dtis/tech_connect/SFFiberFeasibility.pdf

International Network of E-Communities (INEC). **Stockholm Declaration on Open (broadband) Networks.** November 8, 2006. http://www.1st-mile.com/resources/ospn-references/stockholm_declaration/

Christopher Mitchell. **Municipal Broadband: Demystifying Wireless and Fiber-Optic Options.** Policy Brief. Minneapolis, New Rules Project, Revised March 2008. <http://www.newrules.org/info/munibb.pdf>

Amelia Bryne Potter and Andrew Clement. **The Value of Municipally Owned and Operated Broadband Utilities.** Community Wireless Infrastructure Research Project (CWIRP.ca), Faculty of Information Studies, University of Toronto, April 27, 2008. <http://keeptelecompublic.ca/updir/keeptelecompublic/TelecomCWIRP.pdf>

Amelia Bryne Potter and Andrew Clement. **A Desiderata for Wireless Broadband Networks in the Public Interest.** Paper to be presented at the 35th Research Conference on Communication, Information and Internet Policy, 2007. Community Wireless Infrastructure Research Project, submitted August 17, 2007. http://www.cwirp.ca/files/potter_clement_tprc_2007.pdf

Ricardo Ramirez, Garth Graham, Fred Bigham and Daniel Pellerin. **Broadband for what? Policy implications of an essential public utility.** Ontario Ministry of Government Services. Toward a Broadband Research Agenda for Ontario: Results of 2007 Call for Research Papers, May 2007. http://kmdi.utoronto.ca/broadband/publications/Files/ramirez_paper.pdf