

# **Broadband for what?**

## **Policy implications of an essential public utility**

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### **Abstract**

This research paper focuses on the following question: *In the Information Age, is broadband an essential public utility? If so, what are the implications for public policy?* The rationale for broadband to become an essential public utility is not new. For a century Canadians have been faced with the same debate regarding basic telephone. Like water, railways and roads, telecommunication services provide citizens with a basic infrastructure. What is unprecedented is that we are moving away from seeing the Internet as a sort of built environment, and moving towards seeing it as a kind of mirror for a social ecology that grows through autonomous self-organization. While much of the debate centres on the mechanisms to deliver broadband, we suggest that at least two fundamental drivers for broadband as an essential public utility merit attention: the first is a community development case, and the second is about the nature of the space for interaction and innovation that broadband creates - what we refer to as IP as a commons.

Some key lessons from the literature are that a broadband strategy needs to be part of local development strategy, and that it requires effective support from public socio-economic policy. Broadband both promotes and is promoted by open systems that learn: since the source of wealth in an information society is human creativity, the key underlying public policy issue is how to promote an innovative society that is open to broad social participation. Lastly, the evidence is that municipal ownership of the physical infrastructure may be the only way to guarantee future competition and expansion of services to all citizens.

In our analysis, the Ontario Government is left with a potential moderating role between a market driven approach at the federal level, a community development-focus at the municipal level. In parallel, a policy driven by the notion of “IP as commons” has the potential to mobilize interest, and public education to reduce the trend for privatization of this public space. A broadband policy with the commons as a hallmark would place Ontario as a leader in this sector.

### **Keywords**

Broadband, commons, Internet Protocol, ownership, public utility, municipal planning, rural, remote

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## Contents

<b>ABSTRACT .....</b>	<b>1</b>
<b>1. INTRODUCTION .....</b>	<b>3</b>
BROADBAND AS A TOOL .....	3
METHODOLOGY .....	4
ORGANIZATION OF THE DOCUMENT .....	5
<b>2. POLICY DRIVERS.....</b>	<b>5</b>
BEYOND A BUSINESS CASE: A COMMUNITY DEVELOPMENT CASE.....	5
BEYOND INFRASTRUCTURE: INTERNET PROTOCOL AS COMMONS .....	7
<i>The nature of Internet Protocol</i> .....	8
<i>Internet Protocol as Social Contract</i> .....	9
<b>3. FEDERAL TRENDS.....</b>	<b>10</b>
BROADBAND AT INDUSTRY CANADA AND INFRASTRUCTURE CANADA.....	11
BROADBAND MATTERS: RESPONSE BY INDUSTRY CANADA TO THE RESEARCH TEAM’S QUESTIONS.....	12
FALLOUT FROM THE TPRP .....	14
STATUS OF CRTC TELECOM DECISION 2006-9 – DISPOSITION OF FUNDS IN DEFERRAL ACCOUNTS.....	17
HISTORY REPEATS ITSELF 100 YEARS LATER .....	18
<b>4. ANALYSIS AND IMPLICATIONS .....</b>	<b>20</b>
FROM POLAR OPPOSITES TO MIXED STRATEGIES .....	20
SOME TECHNOLOGICAL ISSUES .....	24
LESSONS FROM THE LITERATURE.....	26
<b>5. CONCLUSIONS.....</b>	<b>28</b>
COMMUNITY DEVELOPMENT AND IP AS COMMONS - TWO POLICY DRIVERS .....	28
A PROVINCIAL MODERATING ROLE .....	29
<i>Municipal government in the limelight</i> .....	29
<i>A federal market-driven approach</i> .....	29
<i>A provincial moderating role</i> .....	30
<b>6. REFERENCES .....</b>	<b>31</b>
<b>APPENDIX A. IP RULES! .....</b>	<b>34</b>
<b>APPENDIX B. STATUS OF DECISION 2006-9 - DEFERRAL ACCOUNT.....</b>	<b>42</b>
<b>APPENDIX C. IMPLEMENTING BROADBAND STRATEGIES: A SELECTED LITERATURE REVIEW .....</b>	<b>48</b>

## 1. Introduction

*"...communication should be measured by the successful coordination of efforts."  
(Peters, 1999, 268)*

### ***Broadband as a tool***

Canada is ranked 9<sup>th</sup> in the OECD (out of 30) and first in the G7 in terms of broadband penetration<sup>2</sup>. Although some would argue that the Canadian market remains far from competitive, the average residential user has at least a choice between a broadband cable connection or a DSL from a phone provider. The cost for this service averages \$45/month plus taxes with some variation for somewhat narrower bandwidth. The urban environment, while not a perfect market, at least responds to some competitive forces and users have choices; 64% of Canadian households have Internet access and 51% subscribe to high speed Internet (Industry Canada, 2007 (forthcoming)).

The value of broadband in economic development has long been established. However like many technologies, on its own it can easily exacerbate differences, making urban organizations more competitive relative to rural ones, or giving an edge to higher income and better educated households (Bandias and Ram Vemuri, 2005, Firth and Mellor, 2005, Parker, 2000, Savage and Waldman, 2005, van Dijk, 2006). In addition, the liberalization and privatization in the telecommunications sector has focused on the market as the driver of broadband expansion. It is not a surprise, however, that the private sector cherry picks the most lucrative markets, and that rural and remote communities lag behind in infrastructure and services. In Canada, approximately 2,000 communities with under 5% of the total Canadian population are expected to remain un-served by 2008 (Industry Canada, 2007 (forthcoming)). This trend is global, and the OECD recommends government involvement for to rural and remote regions where market forces on their own do not result in infrastructure rollout or service upgrades (OECD, 2006).

Broadband connectivity is a tool; therefore the public policy discourse needs to start by answering the question: broadband for what? Is it about universal access and a commitment to reduce the urban Vs rural and remote digital divide? Is it a commitment to regenerate economic

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<sup>2</sup> [www.oecd.org/sti/ict/broadband](http://www.oecd.org/sti/ict/broadband)

development in more marginal communities? This paper addresses these questions as to guide to the policy implications of broadband as a public utility.

## **Methodology**

This research paper focuses on the following question: *In the Information Age, is broadband an essential public utility? If so, what are the implications for public policy?* Our data collection methods included:

- Participation by two co-authors in two Broadband Fora organized by the Ontario Rural Council, in Brockville, ON (March 20<sup>th</sup>.) and in Ingersoll, ON (March 22<sup>nd</sup>.)  
<http://www.torc.on.ca/documents/TORCBroadbandForumPromoFlier.pdf>
- Participation in the March 30<sup>th</sup>. workshop at the University of Toronto with the other research teams (two co-authors by phone).
- Communication and interviews with representatives of Industry Canada, Infrastructure Canada, Statistics Canada, and the CRTC in Ottawa. We acknowledge their commitment to this research and their contributions.
- We used Ingenta (<http://www.ingentaconnect.com/>) to search for recent global journal literature in the following fields: rural economic development, telecommunication policy, information and knowledge society, rural and remote telecommunication, community base networks, community development, and community informatics.
- We complemented the academic literature with gray literature from our own collections.

We prepared summaries of the data collected and we debated our emerging conclusions by sharing drafts of the report. The research team is composed of one researcher-practitioner, and three practitioners with a range of backgrounds. The co-authors of this paper are based in Guelph, ON, Victoria, BC, Winnipeg, MN, and Ottawa, ON. We used Skype (IP telephony) to discuss the literature, the trends and agree on the paper structure. The process and product we followed is an example of the potential of broadband for innovation.

## ***Organization of the document***

In Section 2, we address the two fundamental policy drivers for broadband as a public utility. In Section 3 we review the current status of the broadband portfolio at the federal level, with attention to the fallout from the Telecommunications Policy Review Report, and we report on current trends across federal agencies; we close that section with a brief review of history. In Section 4 we analyze the federal trends in the context of the fundamental policy drivers, we review a number of technological issues, and we summarize the lessons from the literature. In Section 5 we conclude underline the importance of Community Development and IP as Commons as the two policy drivers, and we signal some roles for the provincial government as it positions itself to promote broadband as a public utility. Last, Appendix A includes a detailed explanation about the notion of IP as a commons, Appendix B summarizes the status of Decision 2006-9 – deferral account, and Appendix C provides a select annotated literature review.

## 2. Policy drivers

### ***Beyond a business case: a community development case***

The rationale for broadband to become an essential public utility is not new. For a century Canadians have been faced with the same debate regarding basic telephone. Like water, railways and roads, telecommunication services provide citizens with a basic infrastructure. The debate about the merits of private versus public ownership of any infrastructure is political and ideological. As the late Jane Jacobs eloquently wrote, this is really a dialogue on the moral foundations of commerce and politics (Jacobs, 1992). In the case of telecommunications, however, it is widely accepted that a market-driven approach leaves pockets of un-served areas where population densities are low and where communities are distant from large urban centres. It is also widely accepted that there is a role for government intervention to reduce this urban to rural and remote gap.

While much of the debate centres on the mechanisms to deliver these programs (OECD, 2006), we suggest that –for starters- at least two fundamental drivers for broadband as an essential public utility merit attention: the first is a community development case, and the second is about the nature of the space for interaction and innovation that broadband creates.

The private sector obtains venture capital by developing a business plans to demonstrate the likelihood of a healthy return on investment. The focus is on establishing a “business case”;

and this rationale has been at the heart of many federal and provincial connectivity programs. The implied assumption is that a business case will allow the investment to be sustained beyond the high upfront capital expenditure. A significant challenge in this approach is the narrow focus on an economic return, when broadband in fact has significant potential in other fields like health and education that do not follow this linear, instrumental rationale (Peters, 1999, Turkle, 1995). When it comes to evaluating the benefits of these programs, many of the benefits go beyond what can be quantified, and many emerging outcomes appear that were not expected. It is therefore not surprising that there is growing literature on unpredictable outcomes of information and communication technology initiatives (Andrew and Petkov, 2003, Bar et al., 2000, Denning, 2002, Fink and Kenny, 2003, Mitchell, 2003, O'Reilly, 2005, Ramírez, 2007, Sawhney, 1996, Sawhney, 2001).

“Technological infrastructure should be regarded as both society shaping and socially constructed” (Andrew and Petkov, 2003, 79). Up till now, broadband, like roads, has been seen as infrastructure to be used for social, economic, cultural and environmental wellbeing. If indeed, infrastructure is a means to achieve a broader developmental goal, and if Andrew and Petkov are right to signal that is socially constructed, then the rationale and focus may need to be broadened.

Communities are not just geographic designations, they are “spaces and places” for interaction, innovation and problem solving (Lotz, 1998). *Sustaining communities in rural and remote areas* is a broadband policy driver (Korsching et al., 2000). In other words broadband is a strategic tool in helping communities take control over their own destiny. The way technology works for a community is location-specific; one size of *clothing* does not fit all societies, a society learns to be a *tailor* partly by apprenticeship ...and a society should be its own *tailor* to find the best fit (Stiglitz, 1999).

*“In effect, the Internet and other new communication technologies are helping people to personalize their own communities” (Wellman, 2003).*

Moreover, broadband can reduce the cost of distance, though it does not eliminate it (Bollman, 1994), which makes its potential very significant. The potential benefits cross many sectors, namely health, education, commerce and local government. The potential drawbacks merit attention too: without care socio-economic divides will grow, and out-migration may be accelerated (Grimes, 2000); technology on its own tends to exacerbate existing divides between

haves and have-nots (van Dijk, 2006).

A community development “case” then is more demanding and holistic relative to a business case that focuses on infrastructure and economic returns. This is consistent with calls for information and communication technologies (ICTs) to be integrated into the overall development strategy of a country – in this case of a province (Hanna, 2003). In addition, as has been reported in rural and remote Scotland, investments in infrastructure alone are not sufficient; there is a need for awareness raising and capacity development too (Tookay et al., 2006). These requirements are reminiscent of the Canadian Community Access Program approach that combined training, infrastructure subsidies, while creating social capital among small teams of local champions (Ramírez et al., 2005).

### ***Beyond infrastructure: Internet Protocol as Commons***

In addition to the community development case that may be strategic for rural and remote broadband policy development, there is a second driver that addresses competitive advantage: that all members of a society have access to the Internet as inhabitants of a common space. The foundation of innovation has long been recognized by the organizational analysts:

*Innovation is fostered by information gathered from new connections; from insight gained by journeys into other disciplines or places; from active, collegial networks and fluid, open boundaries. Innovation arises from ongoing circles of exchange, where information is not just accumulated or stored, but created. Knowledge is generated anew from connections that weren't there before. (Wheatley, 1992: 113)*

A constant creation of new content is the source of wealth in the information society, not the infrastructure itself (Venturelli, 2002). Broadband provides an unprecedented common space for interaction<sup>3</sup>.

*“It is in this interpersonal sociality, the sense of self as a collective individual, that the Internet has its social potency” (Nafus, 2003, 193).*

We go beyond that to explore the metaphor of the park or small town public square, with its weekend market, music festival, and gathering places where people meet, gossip, interact and make deals. In broadband, this public square is not bound by physical space: each inhabitant enters this space with / as an “IP address” to find information, exchange ideas, buy and sell good,

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<sup>3</sup> The notion of an information commons has been harnessed by libraries (Church, 2004).

encounter others, or just go for a stroll<sup>4</sup>. This notion is compatible with Lotz' (1998) emphasis on community as the place for innovation.

*We argue that the evolution of the Internet is reaching—in terms of distribution of resources and opportunities —a stage similar to that which characterized the industrial city of the late nineteenth and early twentieth centuries, and that it is possible, therefore, partially to extrapolate the model provided by interventions in such **urban parks as a reference for public policy initiatives that address issues of access, equity and participation in cyberspace.** (Concetta et al., 2004, 339) [our emphasis]*

We refer to the broadband as a “commons” because, like the public square, it is a powerful metaphor - much more powerful than the broadband as public infrastructure because it sheds light on the wealth of interactions through which innovation arises. However, as was alluded to in the introduction, this public space is also under pressure for privatization. Those advocating for “internet neutrality” are wary of the potential loss of creativity.

*A constellation of interests is now seeking to increase its ownership and control of creativity. We are told that these interests require new laws and rights that will allow them to control concepts and ideas and protect them from exploitation. They say that this will enrich our lives, create new products and safeguard the possibility of future prosperity. But this is a disaster for creativity, whose health depends on an ongoing, free and open conversation between ideas from the past and the present. (Berry and Moss, 2005, 1)*

In this paper we build on the metaphor of IP as a commons with a keen sense of history, where public and private interests have for over a century shaped which parts of Canadian society get the privilege of telecommunications, and which ones get left on the side. We build the argument, that competition on a global scale needs a driving vision behind a broadband policy, and we sense that at the time of writing there is an unusual policy window to set for such a vision in Ontario.

## **The nature of Internet Protocol**

The Internet is an interactive communications medium that supports social networks of individuals connected into communities of common interest. The rules through which the online parts of those connections are sustained over time are inherent in TCP/IP as a “protocol,” and not in any particular manifestation of TCP/IP in physical network architecture or demand and supply

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<sup>4</sup> For a visual representation of this metaphor see: <http://www.forumonpublicdomain.ca/>

of online services. The operationalization of IP creates a “space” or commons, in which linking decisions made by individuals who inhabit it can be expressed through acts of connection. The social networks so formed are dynamic and self-organizing; their collective behaviours manifest through how they learn, not through how they are organized or designed. The agency of a community of interest is emergent and therefore cannot be managed or predicted from the mix of initial conditions.

IP and its effects are in the public domain. To constrain the full impact of IP is to enclose a commons. The implications of public policy for allowing telecommunications corporations free reign to enclose a commons, are enormous. This is especially worrisome if the Government of Canada abandons the socio-economic objectives in the Telecommunications Act in favour of “market-based approaches (Graham, 2006). It is the role of governments to guarantee that the IP commons remains open. The value of the Internet is sustained through trust. It is the role of governments to inhibit the violators of that trust.

### **Internet Protocol as Social Contract**

IP is a social contract about collaborative relationships. The self-organizing networks that IP was designed to sustain are networks of people. We should not talk about governance “of” the Internet. We should talk about governance “by” the Internet. We have to begin telling politicians that the distributed structure of a society that is online and an economy that is networked is a structure of communities. In such a society, IP becomes a social contract about collaborative relationships in which everyone acts as “router” and as “Universal Resource Locator.”

Many nation states now have national strategies for the uses of ICTs for Development, but Canada does not. They know that open systems learn, and closed systems don’t. The fundamental public policy question related to Internet use then is: DO WE WANT A SOCIETY THAT IS OPEN, OR DO WE WANT A SOCIETY THAT IS CLOSED?

It is not in the public interest to allow the owners of the physical layer to totally control the services, applications and IP layers without broader reference to societal goals. Those are separate things. The right to apply IP in creating new ways of doing old things and new things to do ... the right to question ... should not be blocked; it is a key component of e-government and accountability.

It is becoming clear that the necessary defense of Internet Protocol is the responsibility of local governments. The forums appropriate for participation in dialogue about the implications

and benefits of this change are neither international, nor national, nor even "multi-stakeholder" (in the sense of outsourcing the public good to "non-governmental" agencies). If an Information society is a network of networks, and a nation within it is a network of networks, then the appropriate forums are going to be local. If we now ask local governments what they are doing to defend IP, we will find there are some that do understand the question.

Understanding the central role of IP in socio-economic change is not a question of industrial or technological policy. It is more fundamentally a question a socio-economic development policy. Replacing one kind of technocratic micro-management of a particular sector with a different form of micro-management will not accomplish anything in relation to the larger goal. IP is not a private good that can be commonly provided in the market. No IP, no Internet, and the telecommunication sector's existence now depends on the Internet, not the reverse.

In effect, changes in telecom policy are currently mirroring the same challenge that is occurring in agricultural policy: how to sustain the public domain in trust for everyone in the face of efforts to privatize what is, in essence, unknowable. We are facing an industrialization of the communications system in parallel to the industrialization of the food system. Just as agro-business essentially seeks to place farmers in a dependency relationship, the prime communications carriers seek to complete the movement of individual Internet users from a peer-to-peer relationship to that of a client. For a fuller description of IP as commons see Appendix A.

### 3. FEDERAL TRENDS

*Broadband development thrives when it becomes a national priority  
(Frieden, 2005, 595).*

In this section we review the current trends in the federal government with attention to status of the broadband portfolio, the implications emanating from the Telecommunications Policy Review Panel (TPRP)<sup>5</sup>, and the status of the play regarding the deposition of funds in deferral accounts. We close this section with a brief look at history, with a summary of debates about regulating telephone companies that sound familiar –even if they took place in 1906.

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<sup>5</sup> For a summary of the Recommendations see <http://www.telecomreview.ca/epic/site/tprp-gecrt.nsf/en/rx00066e.html#T7>

### ***Broadband at Industry Canada and Infrastructure Canada***

The two more recent federal broadband deployment initiatives were Broadband for Rural and Northern Development (BRAND) Pilot Program and the National Satellite Initiative (NSI). BRAND started with a \$105M budget in 2002 and concluded on 31 March 2007. “Under the two rounds of implementation funding, 63 projects, representing nearly 900 communities, including 140 First Nations reserves, were selected to receive support for broadband infrastructure builds (\$79.8M). “The Broadband Pilot Program will connect more than double its original target of 400 communities” (Industry Canada, 2007 (forthcoming): 1-2). On the other hand, the NSI was a \$155M initiative launched in October 2003 by Industry Canada, in partnership with Infrastructure Canada and the Canadian Space Agency. “The NSI was created to make available affordable satellite capacity for the deployment of broadband services (such as tele-health, tele-education, e-commerce, etc.) to communities in the far to mid-north, and in isolated and remote areas of Canada, where satellite technology is the only practical solution” (Industry Canada, 2007 (forthcoming), 2). In addition, Infrastructure Canada coordinates the Canadian Strategic Infrastructure Fund (CSIF) with a \$4B budget, out of which \$28.4M has been dedicated to connectivity projects; and the Municipal Rural Infrastructure Fund (MRIF) that has contributed \$5.1M –out of a \$1B budget- to connectivity projects. Overall, these federal programs focus on enabling rural and remote communities to take advantage of broadband to enhance health care, education, government services, e-business and e-commerce, and citizen engagement in local, regional and national issues (Industry Canada, 2007 (forthcoming)). Both CSIF and MRIF will be sun setting in 2013.

With regard to the portfolio, our interviews suggest that Industry Canada is moving back to formulating policy initiatives and away from program funding initiatives. To the extent that any money is or will be available, it would appear that the programs and money will be administered by Infrastructure Canada. Infrastructure Canada's telecommunications portfolio at present is \$85 million under the National Satellite Initiative, which is administered as part of the Canada Strategic Infrastructure Fund (CSIF). The applications are being short-listed by Industry Canada's BRAND team. It is not yet clear whether CSIF will continue with other telecommunications projects; this depend on whether this sector remains a government priority.

There is also a trend whereby the Competition Bureau is taking on a larger role in

regulation, as is evident in a recent report (Scott, 2007):

*In light of the recommendations of the Telecommunications Policy Review Panel and the announcements by the Minister of Industry, the Competition Bureau has been preparing for what it anticipates will be an increasingly active role in the telecommunications sector. The Bureau recently published a draft document entitled: [Information Bulletin on the Abuse of Dominance Provisions as applied to the Telecommunications Industry](#) (the “draft Bulletin”). The draft Bulletin is part of the Bureau's continuing effort to maintain a transparent and predictable enforcement policy. It describes the Bureau's approach under the abuse of dominance provisions (sections 78 and 79 of the Competition Act<sup>7</sup> (the “Act”)) with respect to conduct in the telecommunications industry to the extent that the CRTC has made a determination to refrain from regulating such conduct. The Bureau received 14 [submissions](#) from interested parties providing comments on its approach, including comments from the American Bar Association Sections of Antitrust and International Law. The Bureau is currently reviewing and revising the draft Bulletin in response to the submissions and hopes to be able to finalize the document by later this spring. (Scott, 2007)*

It is worth noting that the CRTC, which is mandated under the Telecommunications Act, follows an ex-ante approach, whereby it gathers opinions (submissions) and prepares regulations that look towards the future, for example with regards to serving high cost areas. On the other hand, the Competition Bureau is mandated under the Competition Act and follows an ex-post approach, whereby it responds to changes that have already taken place in the market place.

### ***Broadband matters: Response by Industry Canada to the research team's questions***

#### **1. What are the main advantages of a market driven approach to broadband expansion?**

*The 2001 Report of the National Broadband Task Force (NBTF) recognized the central role of the private sector in deploying broadband services and resulting benefits from service innovations, greater choice and lower prices due to competition (p. 58). The 2006 Telecommunications Policy Review Panel (TPRP) report (p. 2-6) stated that the Canadian telecommunications market is working well and that regulatory interventions risk causing it significantly negative impacts.*

#### **2. What are the weaknesses and possible disadvantages of a market driven approach?**

*The NBTF and the TPRP both agreed that the market alone is unlikely to serve all rural and remote communities in the near future.*

**3. What indicators / trends do you use as evidence that the current approach is working or not?**

*Industry Canada monitors the status of Canadian communities only in terms of being 'served' or 'unserved', i.e. having access to broadband services or not.*

**4. If you were asked to defend the argument that broadband policy should follow a public utility model (i.e. where the service in question is seen as an essential service such as ordinary phone service and hydro services), what would you say in favour, and against?**

*The NBTF and the TPRP both agreed that the market should retain a leadership role in the provision of broadband services, including acting as a partner for in any initiatives to connect unserved or under-served regions.*

**5. From your experience what is needed to remedy the weakness of market-based approaches for high cost – serving areas (rural and remote)?**

*The experience of the BRAND program shows that, given the availability of funding, engaging partners through a community-driven approach can aggregate sufficient demand for broadband services and contributions towards costs to create a realistic business opportunity for the market to connect high-cost serving areas.*

*In a similar partnership-driven vein at the regional level, Infrastructure Canada has enabled the availability of matched funding for broadband projects under the Municipal Rural Infrastructure Fund and the Canada Strategic Infrastructure Fund envelopes.*

**6. Where is the broadband portfolio today at the federal level? (i.e. distribution of tasks between Industry Canada, Infrastructure Canada and other Departments)**

*Please refer to the document Summary of Broadband Deployment Initiatives in Canada previously shared. Also, Appendix 5 of the CRTC Telecommunications Monitoring Report: Status of Competition in Canadian Telecommunications Markets, July 2006 includes a review of federal and provincial/territorial initiatives as of the publication date. <http://www.crtc.gc.ca/eng/publications/reports/PolicyMonitoring/2006/tmr2006.pdf>*

**7. What examples do you have of provinces implementing programs to support or limit federal telecommunication policy trends?**

See the two documents referenced above. Of special note: the Province of Nova Scotia has recently announced a commitment to ensure that every resident will have access to broadband services by 2009: <http://www.gov.ns.ca/econ/broadband>

**8. If the current federal trends continue (and follow the TPRP recommendations), where will Canada be in 5-10 years with regard to broadband deployment and access?**

*Information is not available to answer this question, however it is expected that advances in technology will continue to lower the cost of providing broadband services in currently unserved or under-served regions.*

**9. There are twenty recommendations in Chapter 8 of the TPRP report (Connectivity: Completing the Job). To what extent is each recommendation being addressed and implemented? What Department(s) and/or Organization(s) are taking or are expected to take lead responsibility?**

*The recommendations of the Telecommunications Policy Review Panel are currently with the Minister of Industry Canada for consideration.*

### ***Fallout from the TPRP***

The Telecommunications Policy Review Panel issued its final report in March, 2006. Current Federal thinking on what they label as “telecommunications” policy, as outlined in substantial detail in the Report of the Telecommunications Policy Review Panel (TPRP), is entirely “market-based.”

*Underlying the Panel's 127 recommendations was the fundamental conclusion that Canada's telecommunications markets have now evolved to a point that justifies replacing the current legislative presumption that favours regulation with one that favours reliance on market forces. While it recognized that there would be an ongoing need for regulation in certain specific circumstances, the Panel concluded “the legislative framework should specify the circumstances in which regulation is still warranted and that it should provide clear direction on the use of regulatory powers so regulation does not unnecessarily impede the development of market forces (Scott, 2007)*

The Government of Canada sees telecom deregulation merely in the context of the global industrialization of the services sector policy framework. Without a corresponding emphasis on local capacity to learn and to apply what being global means, we see some contradictions.

Broadband strategy is a means to the achievement of a well thought out development strategy. The essential starting point for framing any broadband strategy, urban or rural, is the intent to reinforce autonomy in local development decision-making. Beginning with that intention will ensure an increase in local organizational and institutional capacity to learn from Internet use what being online means in the context of daily life of any particular place. Companies and organizations come and go with different CEOs and corporate agendas and strategies. Communities are still constant and still offer the same services to its residents that it did 200 years ago.

*Local communities need to be involved in the design of universal access programs by participating in decisions about particular information access outlets. Indeed, **most studies find that the most effective way of ensuring the economic success of ICTs in rural areas is to encourage local participation and create social institutions in support of the new technologies.** This can be achieved through a participatory approach, to complement technical and economic calculations of telephone placement (Kenny, 2001, 10). [our emphasis]*

Analyses of the TPRP Report by Telecommunities Canada found that the Panel's recommendations did not supply sufficient reason to instruct the CRTC to alter its implementation of the socio-economic development principles stated in the Telecommunications Act (Moll and Graham, 2006, Graham, 2006). They noted that the key driver of change in the current communications context is the Internet, and in particular Internet Protocol, not "telecommunications." A limited telecommunications mandate did not allow the TPRP to fully consider the local implications of the Internet's impact.

In flagging issues that the TPRP therefore missed, Telecommunities Canada recommended a "National ICT Policy" grounded in an understanding of the positive impact of Internet Protocol on structural change and socio-economic and political development to include as follows:

- 1. The Government of Canada initiate an overall review of communications that is framed in the context of the uses of ICTs for development, Internet Protocol (IP) as the vehicle which will bring that development to Canadian communities, and telecommunications as the infrastructure which will make that development a reality. The telecommunications sector must be a means to the end of Canada's socio-economic development and not an end in itself.*

2. *“Given the importance of ICTs to the future of Canadian prosperity and culture, consideration should be given to assigning this converged policy-making role to a separate new ‘Department of Information and Communications Technologies’.” The need for a more horizontal understanding of the Internet’s impact on communications and on communities should call into question our continued reliance on Industry Canada to play the dominant coordinating role in federal policies and programmes for a “connected” Canada. The focus of policy and program in the public interest needs to be on the uses of ICTs for development, not “technologies.”*
3. *Internet Protocol be identified as a public good and that any regulations that would restrict open networks pass through an ICT advisory group that would include communities, municipalities and public interest advocates as well as private sector representatives. The telecommunications service providers themselves have a huge incentive to contain bandwidth use to the infrastructure channels they are prepared to provide. Without a clear message on this issue, it is much more likely that the telecommunications sector will ‘destroy’ IP, than it is that government regulation will destroy the telecommunications sector.*
4. *A recast Section 7 of the Telecommunications Act include:*
  - *An affirmation that telecommunications performs an essential role in the maintenance of Canada’s sovereignty and identity*
  - *An objective that telecommunications systems, as ICT infrastructure, serve to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions.*
5. *Canada needs a National ICT Strategy that identifies broadband as a key to development and therefore, a basic service. That strategy should favour community-based and owned horizontal IP infrastructure, indirectly supported by federal development policy, but directly facilitated through provincial and municipal programs. Effective change strategies begin at the local level. They are bottom-up not top-down. Yet, through its intense market focus, the TPRP Report precludes any debate on local ownership of open-access networks before it even begins.*
6. *In order to increase the productivity of small and medium enterprise, government efficiency, social well-being, and the efficacy of the social economy, a new Digital Opportunities Strategy needs to be formulated which will capitalize on and extend the existing infrastructure enabled largely by the Community Access Programme<sup>6</sup> and its provincial partners. As part of this strategy, a Digital Opportunities Secretariat should be formed to coordinate cross-departmental measures to ensure full use of*

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<sup>6</sup> For recommendations regarding the future of CAP, refer t (Pacific Community Networks Association, 2006).

*Canadians extensive investment and experience in community-based approaches to the uses of the Internet for local development (Moll and Graham, 2006).*

In summary, the net effect of community-based approaches to the ownership and control of local communications infrastructure is to stimulate economic development, increase social well-being, and improve government service delivery in those areas and among those groups least likely to have profited from digital opportunities. The benefits of a telecommunications system should be counted in social and economic benefits to communities, not profits to corporations. The broader goals in the current Telecommunications Act speak to a larger vision of ICTs for development – a vision that will be essential in the new knowledge-based society.

### ***Status of CRTC Telecom Decision 2006-9 – Disposition of Funds in Deferral Accounts***

Decision 2006-9 was issued on 16 February 2006. Deferral accounts had been created in 2002 as an element in the Commission's price cap framework. Incumbent Local Exchange Carriers (ILECs<sup>7</sup>) were to place amounts equal to the revenue reductions that would otherwise have resulted from an application of the price cap formula into the deferral accounts. During the 2002-2006 period approximately 50% of the funds in the deferral accounts were used to reduce rates for competitor's services. Then, in Decision 2006-9, the Commission determined that the remaining funds (approximately \$650 million) should be focused on communities where, broadband service is neither available from any service provider nor part of existing commitments or planned roll out of services from any other government broadband expansion programs. More recently, in

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<sup>7</sup> The ILECs include: Aliant Telecom Inc. (now part of Bell Aliant Regional Communications, Limited Partnership (Bell Aliant)), Bell Canada, MTS Allstream Inc., Saskatchewan Telecommunications, TELUS Communications Inc. (now called TELUS Communications Company (TCC)), Société en commandite Télébec (which is now part of Bell Aliant), and TELUS Communications (Québec) Inc. and TELUS Québec, which is now part of TCC.

Telecom Public Notice CRTC 2006-15, 30 November 2006 the Commission initiated a proceeding to consider the ILECs submissions regarding the disposition of the funds accumulated in their deferral accounts<sup>8</sup>.

On November 21, 2006, the Consumers' Association of Canada (CAC) and the National Anti-poverty Organization (NAPO) formally appealed the CRTC Decision 2006-9. CAC and NAPO requested the Federal Court of Appeal to set aside the Commission's determinations in Decision 2006-9 and instead direct the Commission to return the deferral account monies to the ILEC subscribers who paid the rates that provided those monies. In this connection, it should be noted that Commissioner Cram submitted a dissenting opinion in Decision 2006-9 which concluded: "When I balance this along with the harm to competition which I believe will ensue versus a customer rebate with minimal inter-generational inequity and administrative simplicity, I would have given subscribers their money back." Moreover, the Federal Court also granted Bell Canada leave to appeal Decision 2006-9 on the grounds that the CRTC exceeded its jurisdiction to the extent that it approves rebates from the deferral account. Both the CAC/NAPO and Bell Canada appeals are expected to be heard in 2007.

One may conclude that, at best, the funds in the deferral accounts will not be available for any broadband projects until mid-year 2008. At worst, the Federal Court of Appeal could rule in favour of direct rebates to the subscribers and hence no funds would be available for broadband projects. Hence, broadband projects in Ontario in the next 1 to 2 years will need to seek and secure funding from sources other than the CRTC deferral accounts. Appendix B provides more details.

### ***History repeats itself 100 years later***

What we are living today in federal and provincial politics regarding telecommunications regulation is not new. The following abstract from a draft thesis shows how history repeats itself.

*...Finally, in March 1905, the government reacted to this continuing debate. Sr. William Mulock, Postmaster General moved that a select committee be formed*

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<sup>8</sup> There is an extensive record of submissions in connection with Public Notice 2006-15 available at: [http://www.crtc.gc.ca/PartVII/eng/2006/8678/c12\\_200615578.htm](http://www.crtc.gc.ca/PartVII/eng/2006/8678/c12_200615578.htm). The data in this record may be very helpful in the ongoing broadband research initiative of the Ontario Government.

*“to consider and report what changes, if any, are advisable in respect of the methods at present in force for furnishing telephone service to the public”  
(2)*

*Moreover, the Postmaster General confessed to a bias and stated that he could envisage*

*“why is it not as much the duty of the state to take charge of the telephone as it is to conduct the postal service” (3)*

*In contrast, Mr. A.B. Aylesworth, council for Bell Telephone, declared before this committee that public ownership was an ‘unmitigated nuisance’ and denounced it in every aspect. Then, in November of 1905, Mr. Aylesworth won a by-election in North York and became the new Postmaster General. Sir William Mulock had returned to England to accept a judgeship.*

*In March, 1906, the government proposed amendments to both the Railway Act and Bill’s corporate charter. The Minister of Railways and Canals stated that:*

*“The provisions of the Bill guarantee the public interest without in any way being revolutionary in their character in reference to their telephone organization.” (4)*

*These bills proposing public regulation had not been introduced without the ‘benefit’ of a report from the select committees established by Mulock and Mr. W.F. Maclean reacted as a betrayed man. In irate tones he stated:*

*“The new Postmaster General led the people of North York to believe that he would follow in the footsteps of his predecessor and we were told that we might look out for a new Paul, a Paul greater than the preceding Paul; but instead of that we have a Saul who stoned the prophets, and stoned public ownership before that committee.” (5)*

*A further prime minister, Mr. R.L. Borden, gave a more balanced response in the initial debate. He stated:*

*“Apparently the views of the Postmaster General (Mulock) did not commend themselves to the rest of his colleagues, and we do not know how far that particular question may have had to do with the retirement of the honorable gentleman. But, if the government are not prepared to go any further in the direction of public ownership, then the only alternative is the most effective control that can be devised by statute with respect to what is in most cases a monopoly.” (6)*

*Minister of Justice, Hon. Has. Fitzpatrick, concluded the initial debate with the statement:*

*“...I am bound to say to my hon. friend from South York (Mr. W.F. Mclean) that when this Bill comes up again, we shall be prepared to discuss the question of public ownership if he desires... I look upon the telephone at the present time as being an essential requisite of our modern civilization. It is as necessary it seems to me, under existing conditions almost as water and light, and in that view it is important that we should make provisions for an effective control over telephone companies as we can have consistent with private ownership; and I think myself that private ownership with effective government control is an ideal system.” (7)*

*This ‘ideal’ was adopted in July, 1906 and Bell became subject to the scrutiny of the Board of the Railway Commissioners. Ten years later a Dominion charter was granted to the Western Telephone Company (name changed to British Columbia Telephone Company in 1919) and hence, this company was brought under the Board’s jurisdiction. In contrast, separate companies in the Maritime provinces purchased Bell’s property in 1888 and provincial regulatory commissions were created soon after the Federal legislation in 1906. The Governments of Manitoba and Alberta in 1908 and Saskatchewan in 1909 purchased Bell’s assets and immediately opted for public ownership as the mechanics of social control in their respective provinces.*

#### **Endnotes**

- (1) *Debates of House of Commons, 4<sup>th</sup> Session, 9<sup>th</sup> Parliament, p. 326.*
- (2) *Debates of House of Commons, 5<sup>th</sup> Session, 9<sup>th</sup> Parliament, p. 2682.*
- (3) *Ibid., p. 2682*
- (4) *Debates of House of Commons, 6<sup>th</sup> Session, 9<sup>th</sup> Parliament, p. 744.*
- (5) *Debates of House of Commons, 6<sup>th</sup> Session, 9<sup>th</sup> Parliament, p. 752*
- (6) *Ibid., p. 758*
- (7) *Patten, William, Pioneering the Telephone in Canada, Private Publication, Montreal (1928), p. 67.*

Source: Bigham, F. (n.d.) *History of telecommunications regulation in Canada*. Draft doctoral thesis. pp. 8-10

## **4. Analysis and implications**

In this section we contrast the two drivers for broadband policy –a community development case and IP as a commons- with the federal trends. We then focus on implications in terms of a provincial policy framework that addresses broadband as a public utility.

### ***From polar opposites to mixed strategies***

Current broadband policy is faced by two polar opposites: a market driven, privately owned and operated approach, Vs a commons approach, with a range of options in terms of public ownership of the network and private provision of services. While the commons approach

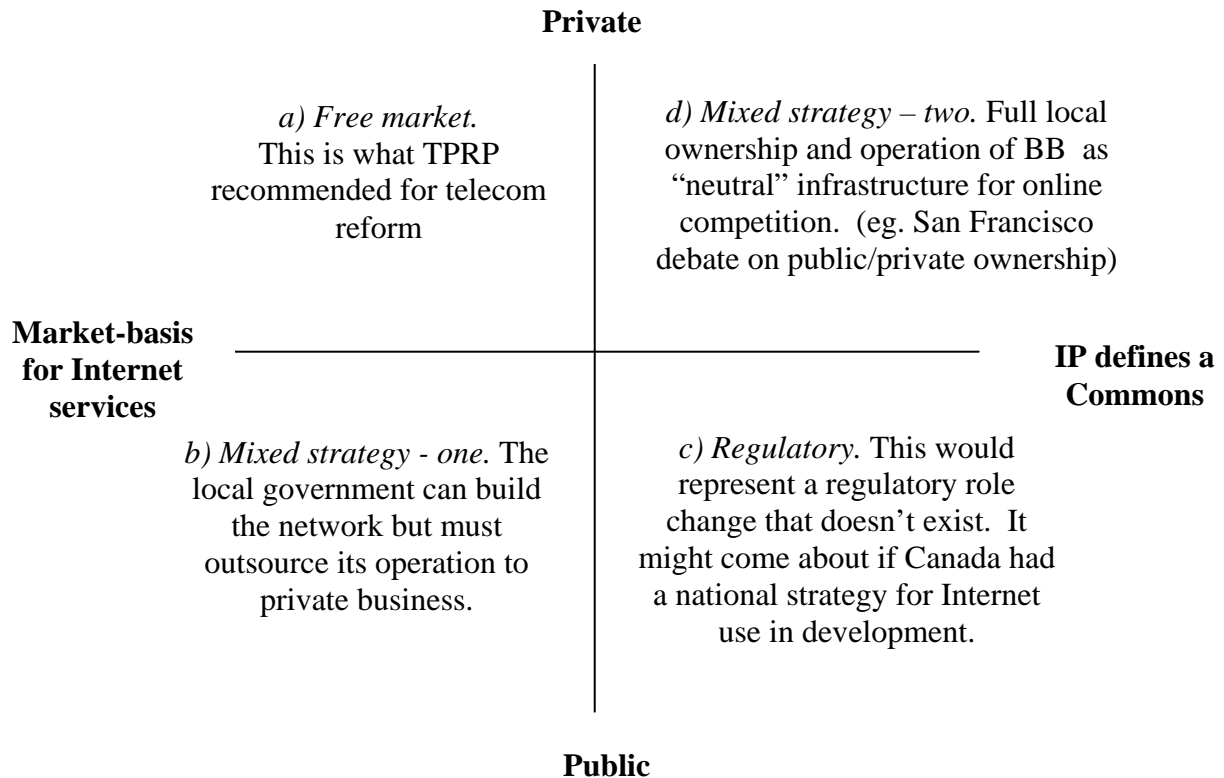
includes a range of options, from a policy design point of view we are in fact a fundamental dichotomy. In today’s globalized system, the push for market-driven solutions has become a dominant discourse. The discourse at time takes a dogmatic tone, as if it was an uncontested ‘given’. For example, the World Bank – the largest multilateral source of rural telecommunications financing- has been criticized for using a narrow selection of indicators and select case studies that respond to its economic policy priorities to confirm its “best practices”, while ignoring other examples that are yielding results but happen to use different approaches that lie outside the bank’s prescribed formula (Courtright, 2004).

The following table lays out the dichotomy in approaches.

Variables	Approaches or Perspectives	
	A commons approach	Market driven
Entry point (the rationale for the policy framework)	IP creates a commons for innovation (a process of interaction and learning)	Infrastructure (the pipes)
Emphasis	Innovation through open systems (eg open-source for software code)	Private for-profit platforms for innovation
Metaphor	Inhabitants interacting in a public city park	The private enterprise as broker
<b>Roles and implications</b>		
Federal trends	The social and cultural role of telecommunications is at risk from erosion in the Telecommunications Act	TPRP advocates this direction, though there is also a call for U-Can <sup>9</sup>
Provincial implications	There is scope for a provincial vision with a community development thrust to counterbalance federal trends	Subject to whether a U-Can program is established, and its approach.
Municipal implications	The municipal level of government is best positioned to develop community-based, locally relevant solutions.	Rural and remote municipalities are consistently left behind by market driven approaches.
Role of public and private sectors across different business models	Example: a public utility or a municipality owning the “first mile” network and leasing its use competitively (Vargo Daggett, 2007)	There are examples of carrier-owned municipal networks in rural Ontario, but they depend on government subsidies for capital investments.
Technology implications	Technology needs to be standards based to allow for a wider selection of goods and allow for building upon.	Technologies used can be limiting to investments that need to mature before upgrading
Benefits (how to gauge who wins and who loses)	Negotiated on the basis of communities’ interests and livelihoods	Established by corporate interests: market share and financial returns

<sup>9</sup> Ubiquitous Canadian Access Network, a targeted government subsidy program.

Beyond the polar opposites, we see more possible combinations. The four quadrants below portray four scenarios. Scenario a) is a purely market driven approach. Scenario d) is a theoretical case for which we have very few examples. We instead examine the relative benefits and implications of scenarios b) and c) which call for some form of local government intervention, but for which there are a number of additional factors to take into account.



The b) strategy separates ownership of the infrastructure from its operation. The emphasis is on municipal ownership over the physical infrastructure as the only way to guarantee future competition. It seeks to use government funds to subsidize capital expenditures, a practice that has been applied in other OECD countries, with many variations (Anderson, 2003, Venturelli, 2002). It is also the only way for municipalities to have the leverage to insist that Internet Service Providers (ISPs) service the most remote households (Vargo Daggett, 2007). We note, however that in the United States incumbent suppliers are opposed to any municipal involvement (Gubbins, 2002). Appendix C includes an annotated review of broadband literature with cases

that fall, mostly in b) and in one select case in c) (Columbia Telecommunications Corporation, 2007).

The text below provides a summary of different public ownership alternatives.

***What is Public Ownership?***

*Public ownership means ownership by citizens, customers, or the community. It comes in many different forms.*

*Municipal Networks are owned by a local government entity. This may be the city itself, as in Saint Cloud, Florida, or a municipal utility, as in Moorhead, Minnesota.*

*Cooperative Networks are customer-owned, as is the case with the Mountain Area Information Network in North Carolina.*

*Non-profit Networks often are a partnership between a number of public and non-profit entities. OneCommunity (formerly OneCleveland), for example, is owned by a non-profit organization established through a partnership between a number of public and non-profit entities.*

*Community Networks consist of individual users owning the hardware and voluntarily participating in an ad-hoc network. Some are sponsored by non-profit organizations. Typically these networks offer free access. SoCalFreenet, NYCWireless, Seattle Wireless, and Ile Sans Fil in Montreal are all community networks.*

*Hybrid Networks. Many networks are hybrids, building on the strengths of multiple partners. For example, REA-ALP Internet Services is a partnership between Runestone Electric Association, a rural electric cooperative, and Alexandria Light and Power, a municipal utility. The Urbana Project is a partnership between Champaign-Urbana Community Wireless Network and the City of Urbana. Austin Wireless is a community wireless network, but operates some portions of its network in cooperation with the City of Austin. (Vargo Daggett, 2007, 3)*

## ***Some technological issues***

While technological dimensions lie outside the focus of this paper, we include a few issues that are relevant and lead to some possible and innovative roles for the Province of Ontario.

### **Standards-based technology**

Technology needs to be standards based -as opposed to brand-dependent- to allow for a wider selection of goods and allow for building upon them. Technologies such as the 802.11 b/g (WiFi) standards are published and allow for different manufacturers and suppliers to build product against. Having multiple users and groups working on the technologies allows for eventual lower costs and resale value. For the 802.11 market this has allowed original equipment manufacturers to develop multiple products working off of one set of specifications that are accepted by a larger group of users. For example, a wireless router works in all countries with only modifications to the frequency portion; modulation schemes and error correction are the same. Thus through having good open documented specifications, a manufacturer can enter the supply chain. If one manufacturer's processes are better, then he can supposedly deliver a product at a lower manufacturing cost. As the specifications are endorsed and accepted by a wider group it is easier to track and contribute to the code base, further enhancing the products. An example would be the adoption and costs of working with the Unix derivatives such as BSD and Linux (both open source operating systems) compared to the closed groups such as QNX, a real-time operating system that users pay for (though it may recently have shifted to open source). A standards-based approach to requests for proposals (RFPs) is therefore preferable.

### **First mile broadband technologies**

We use the term "first mile" –as opposed to last mile- to emphasize that the process must begin with and at the community level.

Across the OECD, the breakdown of technologies is 62% for DSL, 29% for cable modem, 7% for fibre (to the home and to the business combined), and 2% for other (satellite, fixed wireless, and powerline communication) (OECD, 2006). We expect to see the continued prevalence of cable and ADSL technology. For incumbents, these are the most cost effective

options in urban areas<sup>10</sup>. Other options (FTTH or fibre to the home, and FTTB or fibre to the business) only make sense in very high-density contexts (case of Japan<sup>11</sup>), even with the entry of IP-television which still operates effectively over coaxial cable.

There now a number of emerging experiences in Canada with WiFi, namely in large urban centres, though some rural examples are emerging<sup>12</sup>. As to the potential between WiFi and WiMax, the major difference is that the former uses unlicensed spectrum, while WiMax is only available to those with a license. WiMax is WiFi with enhancements and a different modulation scheme to allow for longer distances. It operates at different frequencies. The licensed spectrum allows for a higher power output from the base station and from the end devices. This is what permits cell phones to work at a range of several miles<sup>13</sup>. Beyond the “first mile” technology options, however, transport of bandwidth into a community is of paramount importance.

## **Transport**

A lot of municipalities are not in a position to take on broadband for their operation. While certain segments of the community may be, this will vary from community to community. However, there is no question that all have a stake in the availability and price of transport into the community. For high cost serving areas, the provincial government could negotiate a form of equal access, though open third party access on the transport side would be required. There is excess capacity in existing provincial networks dedicated to education (ORANO) and health -

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<sup>10</sup> ILECs are serious about protecting/advancing market share and doing that as much as possible within the framework of existing business practices (i.e. using tech to reduce costs but not passing on the savings unless forced by real competition). In other words, incumbents have no incentives to innovate with leading edge technology, whereas new entrants into the system are quick adopters (Vargo Daggett, 2007).

<sup>11</sup> Japan leads the OECD in fibre connections directly to the home with 7.9 million fibre-to-the-home subscribers in December 2006. Fibre subscribers alone in Japan outnumber *total* broadband subscribers in 23 of the 30 OECD countries. (OECD 2006).

<sup>12</sup> Chapleau in northern Ontario is one case where Bell and Nortel have been testing a WiFi mesh, with FedNor support for the backhaul. [http://www.nortel.com/corporate/success/ss\\_stories/collateral/nn117540.pdf](http://www.nortel.com/corporate/success/ss_stories/collateral/nn117540.pdf)

<sup>13</sup> Bell and Rogers have a joint use agreement on the 2.5 ghz spectrum taking over from Inukshuk. This is a licensed band and will allow for point-to-multipoint distribution of Internet access. While the same can be done over unlicensed spectrum, there is a greater potential for interference in the unlicensed bands. Protection from interference from other devices such as garage door openers, cordless phones and such permit the carrier to offer services with levels of guarantee. The city of Toronto “one zone” service uses WiFi. There are benefits but they would not be used for items requiring real time service. That is why the 4.9ghz band is being assigned to municipalities for essential services; a sort of a private WiFi that will be in a protected and licensed frequency.

Smart Systems for Health Agency (SSHA). School boards tend to go through ORANO but by doing so, they are prevented from redistributing the signal outside of the education system; health goes through SSHA with the equivalent restrictions. Both systems come into the community on the same microwave or fiber link and run across the same backbone.

The Province could become the wholesale buyer of excess broadband across existing networks, although this would require a centralized Information Technology department for Ontario. In this scenario, the Province could offer bandwidth to municipalities at very competitive rates, relative to the private sector<sup>14</sup>. This capacity could be offered to non-profit groups (libraries, adult education centres, etc.) who could resell it to their members at cost. The issue of getting to homes can be left up to the groups to go through their communities of learning. Municipalities could lease or build and own the infrastructure depending on the level of ISP competition. This would then open new possibilities: a school board could then offer free or inexpensive Internet to the home of each enrolled student in areas not serviced by commercial ISPs.

### ***Lessons from the literature***

*“We have a mighty tool in our hands, and how we use it is a measure of who we are and what we stand for.” Andrew Cohill, Design Nine, Blacksburg, Virginia*

As is evident from the literature in Appendix C, there is a growing body of literature about the lessons learned from implementing broadband strategies. While all of it notes that access to broadband infrastructure is in its early days, there are some consistent patterns in the descriptions of what works in maximizing the uses of the Internet for socio-economic development. This literature reflects that growing emphasis on the impacts of networks on social ecology.

The Internet was first brought to the attention of government policy analysts through the lens of technological determinism. Viewed as technology policy, the Internet was understood as the province of engineers. Those holding that view consistently failed to find a necessary link between Internet use - its reason why? - and socio-economic development, particularly the

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<sup>14</sup> The ILECs would argue that lower transport is offset by having subscribers and being able to sell them content. Without all the pieces it becomes unaffordable for them and it “distorts the market place”.

alleviation of poverty. Asking the “why?” question is slowly beginning to reveal the Internet to be a symptom of fundamental shifts in our understanding of social structures, shifts that are more sociological than mechanical.

We have been using spatial models (metaphors) to describe the feeling of daily life online - cyberspace, information highway, digital divide, desktop, etc. In reflecting categorically on the nature of our changing society itself, we've used classification models such as information society, knowledge society, knowledge-based economy, etc. While we let these metaphors falsely shape our design assumptions, we have been aware that none of them are evocative of what we experience. We have only begun to use social orientation metaphors - interactive, connected, collaborative, etc. But they don't really resonate yet, except as abstractions or utopian desires. What is interesting, although still not satisfying, is the emergence of models that mix spatial and social orientation metaphors - network neutrality, commons-based peer production, community online, etc. This suggests that experience of "Internet Culture" is causing a shift to occur in our perceptions of what it is.

We are moving away from seeing the Internet as a sort of built environment, and moving towards seeing it as a kind of mirror for a social ecology that grows through autonomous self-organization.

The emerging patterns from the literature are summarized into the following enabling conditions:

- **Broadband strategy is part of local development strategy:** Broadband strategy should be situated in the context of a well thought out and highly participatory local development strategy, particularly one that recognizes the role of learning in changing institutional and organizational capacities. The community defines what it wants to be, where it wants to go, and harnesses ICTs as tools towards reaching those development objectives (Chicago Digital Access Alliance, Grimes, 2000, Gurstein, 2003, Hanna, 2003, Ramírez, 2001).
- **Broadband strategy requires effective support from public socio-economic policy:** Market failure in under-served areas should be complemented with public policies to continue a regulatory framework that limits concessions to public telecommunications services and that provides public funding to address inequities and stimulate demand and appropriation. Success in implementing a broadband strategy intended for equity and poverty reduction (i.e.

for digital divide objectives) will depend on the specific nature and extent of socio-economic policy and action to achieve those ends (Cava-Ferreruela and Alabau-Munoz, 2006, Hanna, 2003, Nunez, 2006, Spence, 2003).

- **Broadband both promotes and is promoted by open systems that learn:** Since the source of wealth in an information society is human creativity, the key underlying public policy issue is how to promote an innovative society that is open to broad social participation. Since the uses of broadband are absorbed within a networked social context, open processes that share the learning that occurs are essential (Firmino, 2005, Stiglitz, 1999, Venturelli, 2002, Wellman, 2003).
- **Municipal ownership and governance of passive open networks will increase competition:** Public ownership of the physical infrastructure may be the only way to guarantee future competition. Local electric power company expansion into telecommunications has played a significant role in public ownership of last-mile facilities and therefore can provide insight into the potential role of municipal ownership of open networks in solving market failure problems (Columbia Telecommunications Corporation, 2007, Martin, 2006, Gillett et al., 2006, Gillett et al., 2004, Hanley, 1997, Vargo Daggett, 2007).

## 5. Conclusions

*Governments can enhance ICT development by articulating from the top a broad vision of what ICT can do for a nation and its citizens, while leaving to community champions the flexibility to propose specific, “bottom-up,” projects that aggregate the supply of services needed to support the build out of a telecommunications infrastructure (Frieden, 2005, 609). [our emphasis]*

### **Community development and IP as commons - Two policy drivers**

We understand broadband as having a community development case. Moreover, we see that the potential for the “IP as a commons” goes beyond the conventional economic goals (that remain relevant) and creates social networking potential. The community development case provides a

policy justification for broadband as not only a basic public utility, but for its integration into a provincial or municipal development strategy. The second driver is not specific to rural or remote; instead it is a rationale for a public policy that keeps the commons open and resists private sector attempts at cordoning off sections of the Internet; for example under the guise of “traffic shaping” (Geist, 2007). Hence the two central policy drivers are a community development purpose, and IP as a commons.

If indeed we are moving away from seeing the Internet as a sort of built environment, and moving towards seeing it as a kind of mirror for a social ecology that grows through autonomous self-organization, then both public policy and research have some catching up to do.

## ***A provincial moderating role***

### **Municipal government in the limelight**

The case studies reviewed from the literature emphasize the importance of municipal ownership over the learning process involved in getting the services in place, and the infrastructure itself. The ownership over infrastructure is not a recipe for all situations. In locations with no competition and low populations densities (ie high cost serving areas), the evidence shows that municipal ownership is the key leverage mechanism available for a municipality to ensure their contracted ISPs service the least profitable customers (Vargo Daggett, 2007, Gillett et al., 2006). Another major issue at this level is achieving right-of-way; the vertical real estate as well as along hydro, rail and other corridors. Municipalities are well positioned to negotiate these with the public utilities. On the other hand, from a community development perspective, it is this level of government that is best able to aggregate demand and respond to community needs. Community based networks across Canada have demonstrated this role as mediators and negotiators on behalf of local interest (Ramírez et al., 2005). It is for these two reasons that we place the limelight on the municipal government.

### **A federal market-driven approach**

The trends we have described at the federal level point towards a predominantly market driven approach. Our review of the literature shows that other countries have tried this approach and have consistently found the need to complement it with government programs. If there is to be a Canadian subsidy program for areas that are consistently left behind by the market (Chapter 8 of

the TPRP called for a Ubiquitous Canadian Access Network U-CAN), the actual instruments are not yet established though one trend is for funding to be channeled increasingly through Infrastructure Canada. In our conversations with Industry Canada officials we learned that the recommendations of the Telecommunications Policy Review Panel are currently with the Minister of Industry Canada for consideration. At the time of writing, there was no evidence at the federal level for a U-Can program, and this would be an issue where the Province of Ontario could seek clarification to learn whether there will be additional funds to its \$10M to enhance the broadband roll out during the current fiscal year.

### **A provincial moderating role**

In our analysis, the Ontario Government, is left with a potential moderating role between a market driven approach at the federal level, a community development-focus at the municipal level and an IP as commons approach as a policy driver. The \$10M funding for the 2007-08 fiscal year could play a role in catalyzing broadband expansion in targeted communities (reducing the digital divide). In parallel, a policy driven by the notion of “IP as commons” has the potential to mobilize interest, and public education to reduce the trend for privatization of this public space. A broadband policy with the commons as a hallmark would place Ontario as a leader in this sector.

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## Appendix A. IP rules!

**Garth Graham**<sup>15</sup>  
**April 23, 2007**

Values affect the shape of technologies. Briefly, the values that systems and devices embody are not simply a function of their objective shapes. We must also study the complex interplay between the system or device, those who built it, what they had in mind, its conditions of use, and the natural, cultural, social, and political context in which it is embedded—for all these factors may feature in an account of the values embodied in it.

Helen Nissenbaum<sup>16</sup>

The values of a market, the values of democracy, the values of our tradition of Internet governance—all these show a place for the commons; and open systems and open code are the Internet's commons. Not an exclusive role, but a central role. And the challenge for our future is to understand this balance in a world where the network becomes the OS.

Lawrence Lessig<sup>17</sup>

### **Internet Protocol as Commons**

The Internet, and in particular Internet Protocol, is the key driver of change in the current communications context, not “telecommunications.” Much more than changes in processes, products and services, IP is driving fundamental shifts in the way that things get done. In essence, the Internet is the Internet Protocol (IP), and therefore it is not the “physical layer” that transports you into the commons that IP creates.

IP is a set of rules for writing software that lets devices negotiate or self organize for themselves the paths that packets of bits follow. All it does is state what governs the movement of packets of bits across routers acting as reciprocating peers. At any one moment, the constituent bits that make up the Internet's flow are the result of millions of decisions to connect that occur at its edges.

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<sup>15</sup> This essay is a synthesis and extension of ideas that were first introduced in two previous papers by Garth Graham:

**Canadians online - creators not consumers:** A critique from a community networking perspective of the Telecommunications Policy Review Panel's Report. Commissioned and accepted by Telecommunities Canada as background for discussion of public policy issues related to the uses of the Internet for Canadian development. June 21, 2006. [http://tc.ca/TC\\_on\\_TPRP2.pdf](http://tc.ca/TC_on_TPRP2.pdf)

**If we are the market for internet, what should we demand?** Breakout session: Telecom policy and the future of CAP. PCNA 2007 Summit, Vancouver, BC, February 24, 2007. [http://tc.ca/we\\_are\\_internet.pdf](http://tc.ca/we_are_internet.pdf)

<sup>16</sup> Helen Nissenbaum . **How Computer Systems Embody Values.** Computer March 2001, 118-120. <http://www.nyu.edu/projects/nissenbaum/papers/embodyvalues.pdf>

<sup>17</sup> Lawrence Lessig. **Open code and open societies: values of Internet governance.** Chicago-Kent Law Review [vol. 74: 1999]. <http://cyber.law.harvard.edu/works/lessig/final.PDF>

One conventional description of how the Internet “looks” uses the spatial metaphor of a structure of “layers.” In that sense, IP resides in the architectural or “design” layer. Because of the informal methods used by the Internet Engineering Task Force (IETF)<sup>18</sup> for evolving the Requests for Comment (RFCs), everything in that “layer” is in the public domain.

Dave Clark's much-quoted credo for the IETF describes "rough consensus and running code" as the key criteria for decision making in the IETF. Aside from a pleasing alliteration, these two touchstones provide a concise summary of the ideals that guide the IETF's decision making. The first implies an open process in which any technical opinion will be heard and any participant's concerns addressed; the second implies a recognition that any decision must be grounded in solid engineering and the known characteristics of the network and its uses.

RFC 3929<sup>19</sup>

Telecommunications corporations did not create the RFCs. But the implementation of the RFCs in code is destructive of entrenched business methods. The Internet will and must evolve but the results of that evolution must remain in the public domain.

In the Internet's history, first came a changed theory of the way that things should be done in networks. The theory was informed by an understanding of the role of cooperation in evolution. Then came the intellectual expression of that changed viewpoint in the IETF's RFCs. These are in the public domain in the sense that ownership of the idea of TCP/IP cannot be claimed by anyone.

Then came the expression of TCP/IP in software, largely through a particular method – open source, free software, or what Benkler has called “commons-based peer production.”<sup>20</sup> The method produces code to be shared with the intent that it is therefore open to evolve. It's being is not derivative<sup>21</sup> of anything. It is emergent. The physical realization of IP in the running of code

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<sup>18</sup> The Internet Engineering Task Force (IETF). **Overview of the IETF.** <http://www1.ietf.org/overview.html>

<sup>19</sup> T. Hardie. **RFC3929: Alternative Decision Making Processes for Consensus-Blocked Decisions in the IETF.** The Internet Society, October 2004. <http://www.rfc-archive.org/getrfc.php?rfc=3929>

<sup>20</sup> Yochai Benkler and Helen Nissenbaum . **Commons-based Peer Production and Virtue.** The Journal of Political Philosophy: Volume 14, Number 4, 2006, pp. 394–419. [http://www.nyu.edu/projects/nissenbaum/papers/jopp\\_235.pdf](http://www.nyu.edu/projects/nissenbaum/papers/jopp_235.pdf) “At its core, peer production is a model of social production, emerging alongside contract- and market-based, managerial-firm based and state-based production. These forms of production are typified by two core characteristics. The first is decentralization. Authority to act resides with individual agents faced with opportunities for action, rather than in the hands of a central organizer, like the manager of a firm or a bureaucrat. The second is that they use social cues and motivations, rather than prices or commands, to motivate and coordinate the action of participating agents.”

<sup>21</sup> For example, the right to be in possession of property as private is derived from the state's permission or title. The authority of the system is imposed on it from outside. The being that occurs in emergence is

then expresses the Internet as a commons which is dynamically the sum total of all human connections that exist “on” it at any one time. Obviously, to refer to it as a commons is to apply a spatial metaphor to describe what is actually a topological abstraction of many dimensions and relationships.

IP itself is not an artifact. It is not a “pipe.” It does not “transport” information” as if information was an object. The Internet’s being emerges only in the dynamic flow created by Internet Protocol and has nothing to do with the physical structure of the “pipes” through which that flow occurs. Just as Alan Turing’s original design for the computer was a mathematical concept that did not specify any devices for building it, IP is a concept that is independent of the devices and softwares that can be invented to implement it.

IP challenges most of our assumptions about the structural nature of relationships. The programmers of IP were assuming that the packets were heading towards individuals who would act in the same way as the routers. Out of the simplicity of that assumption arises something wondrous and new in the experience of social networks. In IP, the choice to connect is an individual choice, not corporate. To sustain the self-organization of networks, the Internet enhances the autonomy of the individual to relate to other individuals without reference to authority or to structures that purport to legitimize or “represent” their choices. The growth and evolution of Internet use continues because more people like the autonomy this gives them than do not.

In an online society, each and every one of us are the URLs – the “Universal Resource Locators.” It is self-defeating for businesses to block our capacity to decide what and where to place our live links among each other. When a market is informed by peer-to-peer relationships then everyone in it is a member. In a networked economy, every market is a community that informs its decisions. There are no more customers. To imagine consumers as passive receptacles of products and services is to ignore the interactive roles we all play in networked systems of demand and supply.

The Internet is an interactive communications medium that supports social networks of individuals connected into communities of common interest. The rules through which the online parts of those connections are sustained over time are inherent in TCP/IP as a “protocol,” and not in any particular manifestation of TCP/IP in physical network architecture or demand and supply of online services. The operationalization of IP creates a “space” or commons, in which linking decisions made by individuals who inhabit it can be expressed through acts of connection. The social networks so formed are dynamic and self-organizing. Their collective behaviours manifest through how they learn, not through how they are organized or designed. The agency of a community of interest is emergent and therefore cannot be managed or predicted from the mix of initial conditions.

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different. The rules covering a self organizing system are inherent inside each element of the system and not externally imposed upon it.

To paraphrase Clifford Geertz<sup>22</sup>, we are animals suspended in webs of significance we have spun ourselves. The power of Internet Protocol comes from the capacity it gives us to spin webs of significance through the choices we make about links. The idea that the Internet can be understood by breaking it down into “carriage” and “content” (that which is expressed) distracts our comprehension of the ways it sustains systems that learn in the direction of the commodity metaphor of “intellectual property.” What really matter are the connections among and between the expressions. For new meanings, new perceptions to emerge and survive, it is essential that our decisions about connecting remain self-determined.

Whatever resources IP presents, they are not finite. IP is not common-like in the sense that can be depleted. But it can be “walled off.” It can be enclosed by so many boundary-crossing qualifications that universal access is rendered meaningless.

IP and its effects are in the public domain. To constrain the full impact of IP is to enclose a commons. The implications of public policy for allowing telecommunications corporations free reign to enclose a commons, as the Government of Canada is about to do, are enormous. It is the role of governments to guarantee that the IP commons remains open. The value of the Internet is sustained through trust. It is the role of governments to inhibit the violators of that trust.

### **Internet Protocol as Social Contract**

The code of cyberspace - whether the Internet, or a net within the Internet - defines that space. It constitutes that space. And as with any constitution, it builds within itself a set of values and possibilities that governs life there. ....And the design of code is something that people are doing. Engineers make the choices about how the world will be. Engineers in this sense are governors.

Lawrence Lessig<sup>23</sup>

Throughout the 1970s, 1980s, and 1990s, the open and decentralized technical architecture of the Internet embodied the technical and organizational values of its design group. Internet architecture and organizations were created at the same time, by the same people, as part of an effort “to unite the community behind a single objective—to focus the effort and guarantee the continued growth of the Internet.

Andrew L. Russell<sup>24</sup>

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<sup>22</sup> Clifford Geertz, **Emphasizing Interpretation.** From: *The Interpretation of Cultures*, 1973. (pp. 4-5). "The concept of culture I espouse. . . is essentially a semiotic one. Believing, with Max Weber, that man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretative one in search of meaning. It is explication I am after. . . ."

<sup>23</sup> Lawrence Lessig. **Open code and open societies.**

<sup>24</sup> Andrew L. Russell. **‘Rough Consensus and Running Code’ and the Internet-OSI Standards War.** IEEE Annals of the History of Computing, the IEEE Computer Society, July–September 2006, 48-61. [http://www.computer.org/portal/cms\\_docs\\_annals/annals/content/promo2.pdf](http://www.computer.org/portal/cms_docs_annals/annals/content/promo2.pdf)

As more than a technical specification, IP essentially defines networked relationships as open. Therefore John Parry Barlow was correct to restate it as, "Only connect. Never separate." But said that way, it can also be seen as a specification that restates the Golden Rule - do unto others as you would have them do unto you. So, when we say that IP is under threat, and that we must find way to rise to its defense, we really do mean it in that sense of operationalizing in social networks what is essentially a moral imperative.

The "protocol" in Internet Protocol can usefully be thought of as encoding a particular kind of social contract. As the code that expresses the Internet's functions evolves, it is important that its design assumptions continue to take the implications of that contract into account.

IP is a social contract about collaborative relationships. The self-organizing networks that IP was designed to sustain are networks of people. We should not talk about governance "of" the Internet. We should talk about governance "by" the Internet. We have to begin telling politicians that the distributed structure of a society that is online and an economy that is networked is a structure of communities. In such a society, IP becomes a social contract about collaborative relationships in which everyone acts as "router" and as "Universal Resource Locator."

Individual autonomy (self determination), rather than anonymity or privacy, is the key driving factor governing social relationship in a knowledge society. In the urbanized world we are all busy creating, the easiest primary vehicle of social control is likely to be fear. Those who resort to a politics of fear will naturally seek to contain the Internet's impact. By defining the way in which relation occurs as "open," the Internet opposes rule by fear. It does this, in large part, by supporting the way in which networks re-define the determinants of identity. The informing that occurs will only be "authentic" to the degree that the encoding of identity ensures the teller of my story is myself.

Either there is IP or there is not. And when IP is there, then we are subject to the routing and connecting powers that its nature as protocol coerces. On balance, we would want there to be IP for the protections it gives us against the misrouting or blocking of others despite its simplistic governing of our reciprocating behaviors. Online, the assertion of individual authority before the fact, rather than demonstration of authenticity after the fact, is always the enemy of collaboration.

To state that it forms a contract is not to claim that the Internet somehow renders the role of government redundant. The rule of law and the rule of IP "govern" different modes of interaction. Law inherently balances (regulates) the effects of competition for scarce resources in the context of zero sum games. IP inherently balances cooperative relationships in the context of non-zero sum games. Both modes operate concurrently to create a dynamic equilibrium in any ecology of human relationships.

Many nation states, although not Canada, are beginning to grasp why governments at all levels need to think through a strategy for the uses of the Internet for development. They know that open systems learn, and closed systems don't. The fundamental public policy question related to Internet use then is:

DO WE WANT A SOCIETY THAT IS OPEN,  
OR DO WE WANT A SOCIETY THAT IS CLOSED?

In the guise of competition, the prime communications carriers actually seek to contain the impact of IP on existing business practices. If they gain protection from competition in the market for carriage/connection they will inhibit competition in the market for content/trade on the Internet. For society overall, the critical value is not the network itself so much as what you can do once you have it.

It is not in the public interest to allow the owners of the physical layer to totally control the services, applications and IP layers without broader reference to societal goals. Those are separate things. The right to apply IP in creating new ways of doing old things and new things to do ... the right to be disruptive ... should not be blocked.

Open-evolution is a first value of the Net—that control be from the bottom up, and that all paths be left open to bottom-up control. The second value we could call universal standing: ... that [the code] sits in the public domain, which means that no one needs the permission of anyone else to take it, and improve it. ... Universal standing keeps open the space for individuals to gain, not power, but authority. And individuals gain authority by their works. ... One gains authority not by a structure that says, you are the sovereign, but by a community that comes to recognize who can write code that works. ... It is the craft of your work and the elegance and power of your solution that commends it and gives it power. Not your status, not your rank, not your corporate position, not your friendships, but your code: running code, that by its power produces rough consensus.

Lawrence Lessig<sup>25</sup>

The erosion of IP closes an open society and constrains the self-determination of identity. How are we going to change the political narrative? When are we going to take back a story that is really ours to tell?

### **Local Ownership of IP's Impacts**

It is becoming clear that the necessary defense of Internet Protocol is the responsibility of local governments. The forums appropriate for participation in dialogue about the implications and benefits of this change are neither international, nor national, nor even "multi-stakeholder" (in the sense of outsourcing the public good to "non-governmental" agencies). If an Information society is a network of networks, and a nation within it is a network of networks, then the appropriate forums are going to be local. If we now ask local governments what they are doing to defend IP, we will find there are some that do understand the question.

The World Summit on the Information Society proved nation states are now alert to, and threatened by, the changes in patterns of governance that are made real by relational networks

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<sup>25</sup> Lawrence Lessig. **Open code and open societies.**

based on peer-to-peer, end-to-end and edge-to-edge. It seems likely that nation states will be slow to advocate strongly for what is after all a phase change in the nature of control that has radical consequences for current assumptions about the nature of governance.

IP changes everything. In a knowledge society and economy, IP networks everything. In the interconnection of networks, the basic relationships of individuals to each other, and to social and economic institutions and mechanisms, is altered. At the society level, to abandon responsibility to resolve complex issues to “markets” is therefore to abrogate a basic responsibility to govern. The way forward in such a society is to place community development at the head of your strategy.

Understanding the central role of IP in socio-economic change is not a question of industrial or technological policy. It is more fundamentally a question a socio-economic development policy. Replacing one kind of technocratic micro-management of a particular sector with a different form of micro-management will not accomplish anything in relation to the larger goal. IP is not a private good that can be commonly provided in the market. No IP, no Internet, and the telecommunication sector’s existence now depends on the Internet, not the reverse.

“By ‘the Internet,’ we ordinarily mean a network of net-works built upon a set of basic protocols called TCP/IP. Owners of physical equipment choose whether to run the protocols on their technology. Obviously, that choice should be unconstrained. ... Technically, this design creates an “**innovation commons.**” Everyone has the freedom to innovate in this space without seeking the permission of anyone else.”

Lawrence Lessig<sup>26</sup>

Lessig concludes, “If the freedom to deploy a technology depended upon permission from the network owner, then the uncertainty of securing such permission would weaken the incentive to innovate.” In Lessig’s terms then, in the current Canadian debate on telecom policy, by pushing for deregulation of telecommunications in favour of a “market-based approach,” the major network owners or prime communications carriers are, in effect, asking government for a property right to block all innovations “that do not benefit network owners, even if they benefit network users.”

A global economy is a networked economy in which IP is everything and everywhere. The Internet on its own renders markets more effective by making them approximate perfect information about price. IP-based networks do not bring new competitors into the telecommunications industry as if that industry were all encompassing. IP-based networks merely bring the telecommunications industry into open competition with other modes of production and distribution.

In effect, changes in telecom policy are currently mirroring the same challenge that is occurring in agricultural policy: how to sustain the public domain in trust for everyone in the face of efforts to

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<sup>26</sup> Lawrence Lessig. **Coase’s First Question: When should there not be property rights?** Cato Institute. **Regulation**, Vol.27, No. 3, Fall 2004. <http://www.cato.org/pubs/regulation/regv27n3/v27n3-4.pdf>

privatize what is, in essence, unownable. We are facing an industrialization of the communications system in parallel to the industrialization of the food system. Just as agribusiness essentially seeks to place farmers in a dependency relationship, the prime communications carriers seek to complete the movement of individual Internet users from a peer-to-peer relationship to that of a client.

Local ownership of community-based open networks can bypass this enclosure and allow for IP to live and breath.

Local ownership of community-based open networks causes the effects of markets as distributed communities to emerge. What IP does is define relationships, in the most basic sense of the word, as peer-to-peer.

The e2e principle [end-to-end] assumes that the network itself performs no function beyond transmitting data packets efficiently. All additional functionality, from authentication to processing is to be done by the end points, i.e. the devices that connect to the network. This differs fundamentally from other communication networks, such as that of the telephone, where the network performs most functions while the telephones remain relatively “stupid” at the end-points.

In suggesting that the role of the network is simply to transport data packets on their way from sender to recipient, the e2e principle also implicitly restricts the functions of the network. The network, for example, is not supposed to filter certain data packets based on their content, nor is it supposed to authenticate them, track them, or alter them. It only ought to pass them on.<sup>27</sup>

What part of “peer” don’t they get? They can own all the fibre, backbone, or spectrum they want. But they do not own IP. We all own IP – and we must not let them take it away. IP is a commons, a public good that corporate interests can attempt to appropriate, exploit and enclose for their own ends, not recognizing that such appropriation utterly destroys it’s utility and value. Corporations will attempt to “close” open network architecture. Corporations will seek to channel the collaborative distribution of functions in the names of “services.” In order to contain those instincts to control, governments at all levels, but especially local governments, must act to safe guard IP in the public interest.

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<sup>27</sup> Viktor Mayer-Schoenberger and Malte Ziewitz . **Jefferson Rebuffed - The United States and the Future of Internet Governance.** John F. Kennedy School of Government, Harvard University, May 2006. [http://ksgnotes1.harvard.edu/Research/wpaper.nsf/rwp/RWP06-018/\\$File/rwp\\_06\\_018\\_mayer-schoenberger.pdf](http://ksgnotes1.harvard.edu/Research/wpaper.nsf/rwp/RWP06-018/$File/rwp_06_018_mayer-schoenberger.pdf)

## Appendix B. Status of Decision 2006-9 - deferral account

**Draft: April 21, 2006 FGB**

### **Telecom Decision CRTC 2006-9, *Disposition of funds in the deferral accounts, and Subsequent Developments***

A short summary of Decision 2006-9 is set out below drawn from the Commission's press release of 16 February 2006.

1. In 2002, the Commission set out its price cap framework and one of the elements of the price regulation regime is the deferral account.
2. The Commission required each Incumbent Local Exchange Carrier (ILEC) (see note below for names of ILECs) to create a deferral account in conjunction with the price cap regime and to place into those accounts amounts equal to the revenue reductions that would otherwise have resulted from an application of the price cap formula.
3. Approximately 50% of the funds in the deferral accounts to date have been used to reduce rates for competitor services but, in March 2004, the Commission initiated a proceeding to address the outstanding amounts in the deferral accounts.
4. The Commission determined that the outstanding funds in the deferral accounts should be deployed in accordance with Canadian telecommunications policy with particular attention being paid to both the expansion of broadband services and initiatives to improve accessibility to telecommunications services for persons with disabilities.
5. More specifically, investments in broadband expansion will be focused on communities where, broadband service is not available from any service provider and is not part of their existing commitments or planned roll out of services and where, the community has not received funding, or approval for funding, from any government broadband expansion programs;
6. In addition, ILECs will be required to consult with provincial government agencies responsible for broadband initiatives to ensure that their expansion plans take into account provincial priorities.
7. Based on the preliminary estimates of the deferral account balances Decision 2006-9 estimated that the deferral account accumulated balances for all of the ILECs in total will be approximately \$650 million.

NOTE: The ILECs include: Aliant Telecom Inc. (now part of Bell Aliant Regional Communications, Limited Partnership (Bell Aliant)), Bell Canada, MTS Allstream Inc., Saskatchewan Telecommunications, TELUS Communications Inc. (now called TELUS Communications Company (TCC)), Société en commandite Télébec (which is now part of Bell Aliant), and TELUS Communications (Québec) Inc. and TELUS Québec, which is now

part of TCC.

**Summary of Telecom Public Notice CRTC 2006-15, 30 November 2006, Review of proposals to dispose of the funds accumulated in the deferral accounts**

In this Public Notice, the Commission initiated a proceeding to consider the proposals submitted in response to Decision 2006-9 by Bell Aliant Regional Communications, Limited Partnership, Bell Canada, MTS Allstream Inc., Saskatchewan Telecommunications, and TELUS Communications Company to dispose of the funds accumulated in their deferral accounts. These five telephone companies are referred to as the ILECs. The following summary pays particular attention to Bell Aliant and Bell Canada because this research paper is focused on Ontario. The summary is drawn from the text of Public Notice 2006-15.

1. On 1 September 2006, Bell Canada – for its serving territories and the serving territories of Bell Aliant Regional Communications, Limited Partnership (Bell Aliant) in Ontario -- submitted a proposal on how to eliminate accumulated funds in its deferral account.

2. The Public Notice invited comments on the ILECs' proposals to expand broadband services and to improve accessibility to telecommunications services for persons with disabilities.

3. Consistent with paragraph 195 of Decision [2006-9](#), the ILECs were to ensure that the communities selected for broadband expansion would be those communities unlikely to receive broadband services from any service provider in the near future.

4. Alternative broadband service providers were to file by 19 January 2007 submissions regarding the exclusion of any community on the basis that it is already served or is likely to be served in the near future. The submissions were to include for each community now served or where service is planned the following information:

- i. The name, location and size of the community being served;
- ii. The number of subscribers being served;
- iii. The extent to which the service is available to the entire community both now and during the ILEC's planned roll-out period along with the detailed roll-out plan by year;
- iv. A description of the current service offerings and the technology employed.

There is an extensive record of submissions, correspondence and responses to interrogatories in connection with Public Notice 2006-15. It is available at:

[http://www.crtc.gc.ca/PartVII/eng/2006/8678/c12\\_200615578.htm](http://www.crtc.gc.ca/PartVII/eng/2006/8678/c12_200615578.htm)). The data in this record may be very helpful in the ongoing broadband research initiative of the Ontario Government.

Examples include:

Example # 1: A submission from Blue Sky Net dated January 19, 2007 which includes an

attached 14 page chart which identifies 392 communities as defined by FedNor (Industry Canada) and Northern Ontario Heritage Fund Corporation. The covering letter describes the attachment as containing:

(i) communities where no Broadband services are available and where there are no plans to deploy this service;

(ii) communities where Broadband services have been deployed;

(iii) communities where Broadband services will be deployed within the next twelve months based on contracts the three Community Based Networks have executed with various Broadband Network providers;

(iv) communities where Broadband service is not currently available, but a Broadband requirements study is underway, and one of the three Community Based Networks expect to be awarding construction contracts prior to September 30, 2007, based on a public tendering process; and

(v) communities are listed alphabetically along with their corresponding district or township. Where broadband services are listed as available they are provided by DSL, Cable or wireless as indicated. In some cases a choice of service delivery is available.

Example # 2: The March 23,2007 submission of BarrettXPLORE is worth noting. The information as requested by the Commission in a letter of March 16<sup>th</sup> is provided to the Commission only. This then represents what are a number of confidential submissions. The public availability of this information must await a Commission decision on such filings.

Example # 3: The interrogatories submitted by BarrettXPLORE on March 30,2007 are also worth noting. A sample of these interrogatories are set out below:

1.Bell ( BXI) 30 March 07-01 PN 2006-15

In Section E-1 of its proposal, Bell states that it will be using approximately 95% of the estimated accumulated balance in its deferral account as of 31 May 2006 to fund the uneconomic cost associated with the expansion of Broadband. Has Bell Canada identified the total cost of completing a province wide (Ontario and Quebec) broadband expansion such that in excess of 95% to 100% of households will have access? If so, please provide the total cost and the technology assumptions used to derive this estimate.

2.Bell (BXI) 30 March 07-02 PN 2006-15

Please provide a list of all communities currently not served by Bell Canada but are a part of its commercial roll out plan over the next 3 years.

3. Bell (BXI) 30 March 07-03 PN 2006-15

Please indicate if any of the communities identified in its commercial roll out plan would be classified as uneconomic by virtue of the definition used by Bell Canada in this proceeding.

4. Bell (BXI) 30 March 07-04 PN 2006-15

Please provide detailed mapping and timeline that identifies the location of backbone facilities by community that are being funded by the deferral account revenues. Also please provide details showing the facilities served by the backbone and connecting facilities. This should include facilities that connect to DSLAMS or Remote Central Offices that the augmented backbone would serve.

### **Related Developments:**

#### **#1 Consumers' Association of Canada (CAC) and the National Anti-poverty Organization (NAPO) formally appealed the CRTC Decision 2006-9**

On November 21, 2006, CAC and NAPO formally appealed the CRTC Decision 2006-9 in the Federal Court of Appeal (Court File No. A-517-06). The Appeal reads as follows

“THE APPELLANT APPEALS to the Federal Court of Appeal from the order of the Canadian Radio-television and Telecommunications Commission (the "CRTC" or the "Commission") titled Disposition of Funds in the Deferral Accounts, Telecom Decision 2006-9, dated February 16, 2006 (the "Deferral Accounts Decision" or "Decision 2006-9") by which the CRTC:

(a) determined that the funds collected in the deferral accounts maintained by the respondent Incumbent Local Exchange Carriers (the "ILECs") should be used to fund programs and services in their own local exchange areas. The funds were to be spent by the ILECs for two purposes: the expansion of uneconomic ILEC broadband initiatives and a minimum of 5% of the funds for improvements to accessibility of telecommunications for persons with disabilities.

(b) rejected the payment of rebates to the subscribers that had paid the local rates that had caused the monies in the deferral accounts to accumulate.

THE APPELLANT ASKS that this appeal be allowed and that an order be granted:

(a) quashing the order of the Commission that provided directions for the clearing the

balances in the ILECs' deferral accounts;

(b) directing that the Commission clear the balances in a manner that would result in the refund or rebate of the monies accumulated in the ILECs deferral accounts to the ILEC subscribers who paid the rates that provided those monies;

(c) awarding the Appellants their costs of this appeal;

(d) such further and other relief as counsel may request and this Honourable Court deems appropriate.”

## **#2 The Dissenting Opinion of Commissioner Cram in Decision 2006-9**

Commissioner Cram submitted a dissenting opinion in Decision 2006-9. Her concluding statement read:

“All of the proposals are fraught with difficulties. The competitors have received their share of the fund. I believe the incumbents have also received their share, in that they were made whole as a result of the Commission reducing the profit margins on Competitive Services. In a competitive world, the incumbents would not have been able to maintain those margins for five years. Thus, both the incumbents and the Competitors have received the same monetary benefit from the fund. When I balance this along with the harm to competition which I believe will ensue versus a customer rebate with minimal inter-generational inequity and administrative simplicity, I would have given subscribers their money back.”

The conclusion of Commission Cram echoes the essence of the CAC/NAPO appeal and the requested order to quash Decision 2006-9. If that is the eventual outcome there will be no funds available from the deferral accounts for broadband expansion.

## **#3 Bell Canada's Appeal of Decision 2006-9 as Reported in the 2006 Annual Report of Telus Communications Company**

The Federal Court of Appeal also granted Bell Canada leave to appeal Decision 2006-9 on the grounds that the CRTC exceeded its jurisdiction to the extent it approves rebates from the deferral account. Both the CAC/NAPO and Bell Canada appeals are expected to be heard in 2007. The Annual Report continues as follows:

“In the event that Bell Canada is successful in its appeal, the Company (i.e. Telus) may realize additional revenue equal to the amount of the deferral account that would otherwise have been rebated by the CRTC. Should the consumer groups be successful in their appeals, the Company may be required to remit a one-time refund of an amount up to, but not exceeding, the aggregate liability of approximately \$165 million in individually small amounts to its entire local residential subscriber base. As the deferral account balance was fully provided for in previous financial statements, the potential refund will not impact the Company's subsequent income from operations. In addition, subject to the potential outcome of this leave to appeal, the Company may need to re-address its intent to extend broadband

services to uneconomic remote and rural communities. The Company supports Decision 2006-9 and its designated uses of the deferral account in order to extend highspeed broadband Internet service to rural and remote communities and improve telecommunications services for people with disabilities.”

#### **#4 Report in Bell Canada Entreprises’s 2006 Annual Report re: Decision 2006-9**

On February 16, 2006, the CRTC issued Telecom Decision 2006-9, where it concluded on the ways in which incumbent telephone companies should clear the accumulated balances in their deferral accounts. On September 1, 2006, Bell Canada and Bell Aliant filed their proposals for clearing the accumulated balances in their deferral accounts. If approved by the CRTC, the proposals would improve access to communications for persons with disabilities (5% of estimated balance) and extend broadband access to some 220,000 potential customers in 264 communities across Ontario and Québec where it would not otherwise be made available on a commercial basis.

On November 30, 2006, the CRTC issued Public Notice 2006-15, initiating a proceeding to assess these proposals. A decision in this proceeding is scheduled to be issued in January 2008.

Bell Canada’s accumulated deferral account balance at December 31, 2006 is estimated to be \$479 million, with an estimated future annualized commitment of \$24 million. Bell Aliant’s accumulated deferral account balance at December 31, 2006 is estimated to be \$8 million, with no estimated future annualized commitment.

Due to the nature and number of uncertainties that remain concerning the disposition of accumulated balances in the deferral account, we are unable to estimate the impact of the CRTC’s decision on our financial results at this time.

#### **Concluding Commentary on CRTC Decision 2006-9, Public Notice 2006-15 and the Related Appeals Before the Federal Court**

At best, the funds in the deferral accounts will not be available for any broadband projects until mid-year 2008. At worst, the Federal Court could rule in favour of direct rebates to the subscribers and hence no funds would be available for broadband projects.

Hence, broadband projects in Ontario in the next 1 to 2 years will need to seek and secure funding from sources other than the CRTC deferral accounts. However, the documents that have been filed in connection with Public Notice 2006-15 and indeed further documentation to be filed in that proceeding as well as the ongoing Federal Court Appeals may be valuable in the specification of broadband projects in the Province of Ontario.

## Appendix C. Implementing broadband strategies: A selected literature review

Cava-Ferreruela, Inmaculada and Alabau-Muñoz., Antonio. 2006. *Broadband policy assessment: A cross-national empirical analysis*. Telecommunications Policy 30:445–463

This research study aims to provide insights into the effectiveness of different policy choices to promote broadband. It provides “an exhaustive cross-national empirical analysis that explores the factors influencing broadband supply, demand, and adoption. The results suggest that technological competition and the low cost of deploying infrastructures on the one hand, and the predisposition to use new technologies on the other, appear to be the key drivers for broadband supply and demand, respectively. They infer that “policies aimed at fostering these drivers seem to be the most effective.”

*For public policies to promote broadband supply, empirical analysis results certainly support the foundations of the soft-intervention strategies [i.e. market-based] that are based on the assumption that the most effective policy for accelerating broadband deployment is to promote technological competition (i.e. between DSL and cable networks). Nevertheless, since it has also been demonstrated that there are geographic areas that are likely to remain underserved (rural and scarcely populated areas), it is reasonable to conclude that medium-intervention strategies that consider public funding for infrastructure supply in these areas could be more suitable for a balanced broadband coverage in the whole territory. Moreover, considering that some types of public support initiatives could be oriented to fostering technological competition, medium-intervention strategies can be considered an effective broadband policy.*

*For public policies to promote broadband demand, empirical analysis results suggest that soft-intervention strategies to increase people’s predisposition and skills for using new technologies and to promote relevant local content could be effective. For public policies to promote adoption, the empirical analysis results allow the conclusion that both supply side and demand-side initiatives should be put into place to effectively promote broadband and the pre-eminence of one type or the other should be based on a detailed study of the specific situation of each territory.*

Chicago Digital Access Alliance, n.d. *Community Benefits Agreement*, for the Chicago Wireless Initiative. <http://www.digitalaccessalliance.org/>

Chicago is quite willing to negotiate the basic development impact question of who benefits and who pays from implementing new communications infrastructure. They say, “No Vendor can lead Chicago to Digital Excellence. Nor can they draft a plan without direct public involvement. Neither Digital Excellence nor Inclusion are within their core competence.” Michael Miranda, Co-Founder of the Chicago Digital Access Alliance says, “We’re calling for a model of Economic

Development where the online face of a community is more than a brochure, and has a back-end that comprises substantial off-line activity and coordination. What is next generation community networking?”

*Leaders in ... Chicago communities have signed on to an outreach and community education campaign and together we demand a community benefits agreement as part of any and all communications infrastructure initiatives in Chicago, and for true community participation in planning and development across the city.*

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

“This Report evaluates the feasibility of City ownership of a 21st Century fiber network to spur private-sector innovation and competition -- and thereby offer revolutionary bandwidth and services to businesses and residents. The Report recommends a market- friendly model in which San Francisco enables multiple communication companies to compete over a City fiber infrastructure that would reduce barriers to entry. The Report also integrates a fiber networking strategy for public safety, public health, educational, and other government use. Fiber deployment for internal City use represents an essential next step in government service. The City fiber network would serve as a backbone for networking to the community.”

*Summary of Recommendations:*

- 1 Build a Fiber Network to Meet the City’s Internal Communications Needs*
- 2 Pilot the FTTP Network in the City’s Enterprise Zone*
- 3 Extend the Fiber City-Wide—With a Competition-Enhancing, Open Model*
- 4 Build Fiber Assets Now for Future Projects*
- 5 Evaluate Regional and Inter-Jurisdictional Approaches*
- 6 Conduct Market Research to Complement this Report*
- 7 Survey Potential Industry Partners to Complement this Report*
- 8 Explore Private-Sector Partnerships for Infrastructure*
- 9 Coordinate Infrastructure Construction With Sidewalk Renovations*

*With respect to preliminary business plan, we conclude that a wholesale or “open Access” model offers the best balance of technology advancement, infrastructure, future proofing, and encouragement for private sector innovation-- and is thereby most likely to facilitate the goals of the City. Specifically, the model:*

- *Is likely to stimulate private efforts to offer diverse, cost-competitive services to residents and businesses. The strategy creates a platform for broadband competition and innovation by separating network ownership from service-provision.*
- *Requires less City involvement in operations than does a retail model because*

*it does not require the City to go into the business of providing communications services itself.*

- *Leverages the considerable City's right-of-way knowledge and utility maintenance capabilities.*
- *Is practical and entails less political risk as well as less financial risk.*
- *Allows the customer to select the provider of their choice. In addition, by separating the service from the infrastructure, the current communications monopoly/duopoly is ended and incentives are reduced to limit available capacity and restrict access to and performance of Internet based applications.*
- *Is emerging as the preferred choice for major City FTTP projects in the United States and Europe.*
- *Fits well with the technical model proposed, which recommends a robust fiber architecture to be managed and maintained by the City with competitive service providers leasing capacity on the fiber.*
- *Requires a smaller capital investment than does the retail model. In a market like San Francisco, the probability of obtaining the required market share to maintain cash flow is higher with the open access model because multiple providers will promote and sell services—not just the City.*

Firmino, Rodrigo José. 2005. Planning the Unplannable: How Local Authorities Integrate Urban and ICT Policy Making. *Journal of Urban Technology* 12(2): 49 – 69.

Firmino asks, “How are cities dealing with the challenge of integrating ICTs and urban development?” He then applies the theory of social construction of technologies (SCOT), “a paradigm that sets out to explain the political and social relations involved in the introduction, acceptance, and absorption of technological artifacts within a social context,” to two European cases: Newcastle in the United Kingdom and Antwerp in Belgium. He concludes with a series of policy recommendations for introducing integrated and coordinated urban-ICT strategies into city governments and local communities:

- *To overcome limited visions based on technological determinism and to increase acceptance of new paradigms of the virtual city and the network society, create a general awareness and comprehension of all issues related to ICT policy and strategy. This could be facilitated by public forums, meetings, and conferences both within and beyond the city administration.*
- *Analyze the concepts and impacts linked to the implementation of the urban-ICT initiatives on the basis of their strategic and structural relevance rather than their*

*immediate and conjectural effects. Consider every aspect of this social construction of information and communication technologies (economic, political, social, cultural, spatial, and aesthetic).*

- *Create a special public body to inspect and coordinate the implementation of the whole strategy according to the principles of public interest.*
- *Maintain high levels of integration among departments and the ICT-dedicated agency (perhaps with some crucial spatial responsibilities delegated to the planning department).*
- *Clearly differentiate among the “areas of impact” (economic, spatial, cultural, etc.) for every initiative. This would increase the visibility of the effects and results related to ICTs. A think-tank internal division of the ICT-dedicated body could help to reflect and give advice on long-term impacts and projects.*
- *Audits and self-assessments must be carried out and discussed with citizens, civil servants, and decision makers. This avoids interpretative flexibility being reduced to a few dominant visions which do not represent the whole of the local government and city.*

Gillett, Sharon E.; Lehr, William H. & Osorio, Carlos A. 2006. Municipal electric utilities’ role in telecommunications services. *Telecommunications Policy* 30: 464–480.

Municipal Electric Utilities (MEUs) provide insight into the potential role of municipal ownership in solving market failure problems and in supporting the evolution of end-user centric networking models. While the number of communities that are being served by municipally owned telecommunication service providers remains small, it has been growing rapidly, and in almost all of these, the provider is the municipally owned electric utility.

This analysis shows that MEUs are more likely to offer such services if they also provide internal communication services to support their electric utility operations (scope economies); are relatively close to metropolitan areas (lower backhaul costs); are in markets with fewer competitive alternatives (cable modem and DSL service availability limited); and which are less encumbered by regulatory barriers to entry (in communities in states which do not restrict municipal entry into telecommunication services).

MEUs may be more willing to serve in communities whose demand profiles are less attractive to the private sector, often with the rationale that the services they provide will help improve exactly that profile (e.g., attract information-intensive industries and jobs to the community). However, MEUs located in more remote areas appear to be just as constrained by backhaul costs as the private sector. This finding suggests the importance of state and regional cooperative networks to which municipal networks can connect.

Grimes, Seamus. 2000. Rural areas in the information society: diminishing distance or increasing learning capacity? *Journal of Rural Studies* 16: 13-21.

Grimes noted a tendency in EU telecom policy “to perceive technological innovation as a means of solving development problems where many other methods have failed.” He cautions against an emphasis on technology as infrastructure “in isolation from the social and economic context in which it is exploited:

*... it is important to realize that the advanced installation of such infrastructure does not ensure its effective exploitation by remote regions. While supply side factors such as the provision of the necessary infrastructure and hardware is fundamental in order for rural areas to benefit from this technology, what is even more fundamental is the existence of a demand for ICT services and of the necessary skills required for exploiting the potential. It is precisely in relation to these latter two factors that rural areas tend to be the most “switched off” or disconnected parts of the Information Society.*

*While the new ICTs do present opportunities for indigenous companies in remote areas to become connected with larger markets internationally, they also present a serious threat to rural areas by facilitating their integration into the global economy. ... It must be kept in mind that telecommunications are a means for two-way communications and while they can help isolated companies to increase sales in distant markets, they also integrate such enterprises into national and international competition.*

*Teleworking, which has been widely hyped as providing the greatest scope to the periphery for exploiting ICTs, has evolved mainly as an urban or suburban form of decentralisation. Only a small minority of highly skilled professionals, possessing well-established market connections, has been in a position to sustain economic activity in remote areas.*

He then recommends “focus on the social dimension,” facilitation of remote regions to improve their knowledge base as “learning regions,” and recognition of the need to foster a sufficient “enterprise culture:”

*The main role of ICTs in facilitating such developments must be seen in a very broad sense, as a means of raising levels of competence and competitiveness in all branches of the local economy. The technology should never be regarded as a substitute for a well-thought out strategy for promoting enterprise. ... Increasing awareness and the provision of training relating to exploiting the new ICTs is the necessary starting point if such technologies are to play a significant role in rural development.*

Gurstein, Michael. 2003. Effective use: A community informatics strategy beyond the digital divide. *First Monday* 8(12) (December).

[http://firstmonday.org/issues/issue8\\_12/gurstein/index.html](http://firstmonday.org/issues/issue8_12/gurstein/index.html)

Gurstein defines “effective use” as, “The capacity and opportunity to successfully integrate ICTs into the accomplishment of self or collaboratively identified goals.” He asks, “Is it reasonable (or useful) to indicate the need for "access" without suggesting a parallel need for training for use, structured links between "access" and production or distribution systems, targets of "access" which correspond to individual or community needs in usable formats?”

*... the kind of ICT developments which would enable an effective participation by local communities in regional, national and even global decision making processes (e-governance) are largely ignored in favour of the design and implementation of efficient and ever more centrally controlled if electronically enhanced service delivery (e-government). Again the early promise of the Internet as a means for enabling widespread distribution of the means for effective active citizenship has not been carried forward. ... "Access" in this context then, is about being able to consume and receive rather than produce and distribute.*

*Thus the focus is not simply on one of the possible "tools" for development (access) but rather highlights the entire "development process" including the infrastructure, hardware, software, and social organizational elements that all must be combined for development to occur. Clearly "access" is a pre-condition of "effective use." However, "effective use" as a design and development parameter for ICTs is not necessarily included in conventional approaches or understandings of responses to the DD. ... The opportunity for defining and developing strategies for "effective use" should become a dialogue between those responding to the perceived inequalities of the Digital Divide and end users who understand most clearly what applications or uses would be most beneficial in particular local contexts.*

Hanna, Nagy, K. 2003. Why National Strategies are needed for ICT-enabled Development. *Information Solutions Group Working Papers* No. 3. World Bank 2003.  
[http://wsispapers.choike.org/national\\_strategies.pdf](http://wsispapers.choike.org/national_strategies.pdf)

Hanna found that “a national ICT strategy must be integrated into the overall development strategy of the country. It should assess the prospects and options for promoting the ICT industry, for using ICT in key sectors of the economy, and for empowering and networking all stakeholders in development. It should also systematically address how to use ICT as an enabling tool, in combination with other instruments, to address the two overarching goals of development: sustainable growth and poverty reduction.” He noted that, “Some aid practitioners view ICT as a threat to established sectors and ways of doing business, and there is subtle but pervasive resistance to the required changes to mainstream ICT into development.” The roles that the strategy should serve are:

- *Raise awareness, resources and commitment to action.*
- *Build coalitions for policy and institutional reforms.*
- *Clarify roles, build public-private partnerships, and facilitate participation by*

*all stakeholders, including NGOs.*

- *Focus scarce resources on exploiting ICT for national priorities and help sequence and phase complementary investments.*
- *Complement market forces, promote societal applications, enable bottom up efforts, and ensure shared learning and scaling up.*
- *Address the special needs and dynamics of promising segments of the ICT industry for export and economy-wide competitiveness.*
- *Re-orient the national innovation system to meet the substantial and cumulative technological learning requirements of ICT (as a general purpose technology).*
- *Address coordination failures, exploit network effects, and secure complementary investments to use ICT as empowerment and service delivery infrastructure.*

Nunez, Flavio. 2006. Geographical gaps in the Portuguese broadband access: Rethinking the role of public funding after years of trade liberalization. *Telecommunications Policy* 30: 496-515.

Nunez describes a “common strategy used by many countries” to encourage investment from the private sector in broadband network diffusion and to remove legislative barriers in order to ensure effective competition as well as to generate innovation and lower prices. But in Portugal, Nunez found that “Market failures originating in pro-competitive policies between private operators may lead to a rethink of the role of public funding after years of trade liberalisation.” Therefore steps were needed “to guide public policies so as to counter balance deficiencies provided by market oriented development of broadband Internet access.”

In mapping the distribution of broadband access in Portugal, he found clear indications that:

*.... competing operators develop market skimming strategies that ignore the great majority of the Portuguese municipalities, including entire towns. Areas with a low demand for information services represent an enormous risk for the investment strategies of private operators. As a consequence, the spatial configuration of their high-speed networks are minimising the impact of ICTs in terms of the (re)location of activities and jobs. The recognition of ICTs as instruments contributing to the increase of geographical disparities is of great concern due to the fact that only the most developed and urbanised municipalities - those which have the best physical communication networks - are currently benefiting from competition between different broadband platforms and are thus able to explore the benefits of ICTs as tools of local development in a more efficient manner.*

*... the diffusion of this technology is undoubtedly a market and profit driven process. If it is certain that recent private companies, operating under profit driven strategies, try to maximise their investment returns, it has also been made clear that Portugal Telecom is following the same type of strategy in regard to investment returns. When this historic operator belonged to the public domain of the State, it was expected that investments in the expansion of the infrastructure*

*network would precede demand. Nowadays, since its privatization and the subsequent obligation to defend the shareholders interests, it is not likely that there will be any significant incitement in ICT use resulting from supply pressure.*

*... the absence of competitive access disproportionately affects services to rural populations and, on the other hand, the relatively lower income level of rural populations raises serious affordability issues concerning broadband subscriptions.*

While acknowledging a primary role for the market in broadband development, he recommends the recognition of the role of public policies in the effective functioning of the market.

*If private-sector investments are insufficient to ensure a widespread availability of these high-speed information networks, one would expect that, according to all political recommendations, the functioning of the market should have been complemented by effective public policies.” These would include a “new regulatory framework:*

- *legitimising adjustments in the concession contract of the public telecommunications service,*
- *application of public funds to correct the inequalities created by the market in under-served areas,*
- *complementary strategies concerning the demand side of the market, where public support should also stimulate the appropriation of these technologies, with the development and implementation of better contents and interactive services.*

Ramírez, Ricardo. 2001. A model for rural and remote information and communication technologies: a Canadian exploration. *Telecommunications Policy* 25: 315–330.

Ramirez proposes a model for rural and remote ICTs describing the interrelationships among the dimensions of policy, organization, community, and technology. He notes several principles for strategic policy and organizational insights as to how rural and remote communities can harness ICTs. He concludes with a hypothesis highlighting the role of mediating organizations to secure affordable and relevant ICT services and applications for rural and remote communities:

*How can other communities accomplish as rich a learning process as the cases reviewed in this study? The learning accomplished by all case study representatives has to do with their skill and confidence in negotiating with grant providers, with community needs, and with technology. They have become ‘jugglers’ of the three dimensions on an ongoing basis. The challenge is to capture the stimulating elements that enabled them to develop those skills, and retain local support. The model and case studies signal some of the stimulating elements, or ‘principles that travel’:*

1. *A continuum of policy incentive programs (in terms of funds and the degree of sophistication required from applicants) that a community group/partnership can access as their capacities and need evolve;*
2. *A team of champions who together can offer visionary, effective management, and facilitation roles; these champions can afford to take risks either because they are skilled enough to be in demand, or because they have an existing separate source of funding. The champions tend to have a rooting in the community; they are there to stay.*
3. *Workable informal relationships between the champions and the policy makers, allowing each to learn from the other, and adapt accordingly. This is the champions' social capital, and they have spent time building this up.*
4. *Community-based electronic network organizations that: (a) respond to a community vision and serve their interests; (b) are flexible to change; (c) are able to take on risks; and (d) are willing to review their service offerings regularly especially with regard to the need to compete with the private sector or complement it.*
5. *Community trust in a local organization (a 'space and place') where the benefits and limitations of ICTs can be explored. This trust is earned, but it also nurtures the networking organization. ICTs may function as a (positive) Trojan horse in that they bring different individuals together to explore the potential of the technology.*

The above elements cannot be imported; they have to be 'grown' locally.

*The hypothesis is: rural and remote ICT initiatives need a local learning space to flourish, where a 'local learning space' may be a mediating organization united by a vision of a desirable community future. The organizations may integrate not-for-profit goals with some commercial behavior. 'Failure to flourish' will be evident in uneconomic service access (only available to powerful institutions in the community) that widens income and information accessibility gaps and reduces opportunities for broad citizen participation...ICT projects will fail if a local learning space does not flourish, which is often the case when outside agencies try to parachute models in from the outside.*

*ICTs are part of a context, along with global markets, jobs, interest rates, tariffs, regulations, political parties, families, weather, and disease. They can be harnessed and put to work to reaffirm where a community wants to be. What is true, however, is that they create a new environment that was not there before, and one that will certainly transform the options that rural and remote communities have at hand.*

Spence, Randy. 2003. Information and Communications Technologies (ICTs) for Poverty Reduction: When, Where and How? Background Paper for *The Harvard Forum : A Dialogue on ICTs and Poverty*, September 2003. Ottawa: IDRC, July 18, 2003.

[http://www.idrc.ca/uploads/user-S/1074024575110618469203RS ICT-Pov\\_18\\_July.pdf](http://www.idrc.ca/uploads/user-S/1074024575110618469203RS ICT-Pov_18_July.pdf)

Spence takes the view “that growth and development are necessary but not sufficient for poverty reduction, and that pro-poor strategies and investments are as important for ICT and knowledge-economy strategy as for other connected areas of social and economic development.” In rapidly changing developing countries, he found that:

*Both a national ICT/knowledge economy game plan and intensive ICT infrastructure investment were essential, ..... initial effects were also disruptive, and created a major change in the structure of economies. Structural adjustment included initial negative impacts, like labour displacement, and differential initial access to ICTs (digital divide) contributed often to some initial decline in distributional equity. As access spread in business, public services and households, the positive economic potential of ICTs prevailed in terms of GDP, but results for equity and poverty reduction depended on the nature and extent of socio-economic policy and action in each country.*

*[In the less advanced developing countries], Clearly, poverty will not be eradicated by ICTs - and for many poor populations, more basic needs may take precedence. But equally, poverty will not be eradicated without these technologies, and failure to maximize their potential for poverty reduction, in this PRSP/MDG era, would be incongruous. The positive dynamic often created by ICTs and the commitment of their beneficiaries and supporting groups, appear highly valuable to global poverty reduction objectives, and it is hard to see poverty reduction succeeding if a large part of humanity is excluded from the knowledge shared by everyone else.*

Stiglitz, Joseph. 1999. Scan Globally, Reinvent Locally: Knowledge Infrastructure and the Localization of Knowledge. Keynote Address, *First Global Development Network Conference*, Bonn, Germany. December 1999. <[http://www.gdnet.org/pdf/226\\_GDNfinal.pdf](http://www.gdnet.org/pdf/226_GDNfinal.pdf)>

Speaking on the epistemological foundations of development, Stiglitz noted that, in a knowledge-based or networked economy, achieving full benefit from the globalization of production actually depends of the localization of knowledge. In effect, all real knowledge is actually indigenous knowledge. He saw “a role far more subtle than just the technology-driven visions of downloading” global knowledge – as useful as that may be.” He then argued three main theses:

- *The overwhelming variety and complexity of human societies requires the localization of knowledge,*
- *Practical know-how is largely tacit knowledge that needs to be learned by*

*horizontal methods of twinning, apprenticeship, and seconding, and*

- *Each society, through its knowledge institutions, should take the active role ("in the driver's seat") in the local learning process.*

That is, one size of 'clothing' does not fit all societies, a society learns to be a "tailor" partly by apprenticeship and a society should be its own "tailor" to find the best fit."

Venturelli, Shalin. 2002. Inventing e-regulation in the US, EU and East Asia: conflicting social visions of the Information Society. *Telematics and Informatics* 19: 69–90.

Venturelli argues that, "The emergence of ideas as capital ... necessarily brings creative capital to the center of public policy." This paper assesses the international approach to Internet policy in the context of distinctive socio-political frameworks evolving in the US, the European Union (EU), and East Asia and describes "a set of underlying structural models of the Information Society particular to each region." In USA, these models are libertarian, public interest, and liberal market. In the EU, these models are liberal market, public service, and national cultural. In East Asia, the models are development, and liberalized corporate.

*Despite the range and diversity of paths to e-regulation suggested in these choices, none adequately addresses the underlying issue of how to promote an innovative society that is open to broad social participation. What is needed at this historical juncture in the international system, it is suggested, is a complete rethinking of the problems and challenges of the new information space in a way that allows its full potential to emerge to the benefit of all sectors of economy and society. The paper concludes, then, with two arguments: first, that the globalization of the information economy and the internationalization of cyberspace have made it imperative that concepts of creativity and innovation be re-assessed and re-positioned at the center of public policy; and second, that the creative and innovative challenges of the information economy should reform the emphasis on hardware and technological issues by prioritizing the knowledge and creative foundations of society.*

*The source of wealth and power in an information economy is found in a different type of capital: intellectual and creative ideas packaged and distributed in different forms over information networks. One might even say that wealth creation in an economy of ideas is derived far less than we imagine from the technological hardware and infrastructure, since eventually most nations, such as China, will make investments in large-scale infrastructure technologies. Rather, this article suggests, prosperity will depend on the capacity of a nation to continually create content, or new forms of widely distributed expression, for which they will need to invest in creative human capital throughout the economy and not merely in the diffusion of hardware.*

Wellman, Barry. 2003. *The Internet in Everyday Life*. Knowledge Media Design Institute,

University of Toronto, October.

[http://kmdi.utoronto.ca/publications/documents/KMDI\\_WP\\_2003\\_4.pdf](http://kmdi.utoronto.ca/publications/documents/KMDI_WP_2003_4.pdf)

This article presents what sociologists have discovered about the interplay between the Internet – and other forms of computer mediated communication – and community. Wellman describes myths about the Internet that are utopian and dystopian. But, as a sociologist examining the evidence of daily routine, he is aware that “people take technology and use it in ways that its developers have never dreamed of.”

*The evidence shows that Internet users are becoming “glocalized,” heavily involved in both local and long-distance relationships. They neighbor, on and offline, and they connect with far-flung friends and relatives, mostly online. But the wired nature of the current Internet means that the more people are online, the more they must stay physically rooted to fixed personal computers and Internet connections at home, work, school or public places. Paradoxically, even as people are connecting globally, they are well placed to be aware of what is happening in their immediate surroundings.*

*In the old days, before the 1990s, it was places that were largely connected: households and workplaces linked by telephone, cars, planes and railroads. Now, it is individual people that are connected... Each person becomes a switchboard, between ties and networks. They remain connected, but as individuals available for contact anywhere and at anytime. They are no longer rooted in the home bases of home, café, and workplace ...In effect, the Internet and other new communication technologies are helping people to personalize their own communities. This is neither a dystopian loss of community nor a utopian gain, but rather the transformation of community from groups to networks.*

Vargo Daggett, Becca. 2007. *Localizing the Internet: Five Ways Public Ownership Solves the U.S. Broadband Problem*. Institute for Local Self-Reliance , January.

<http://www.newrules.org/info/5ways.pdf>

“Local governments have taken the lead in U.S. broadband policy. Hundreds of communities of all sizes are making decisions about how to best deliver universal, affordable access to high-speed information networks. Many are offered seemingly attractive arrangements with no upfront cost to the city. They do themselves and their households and businesses a disservice if they do not seriously explore the costs and benefits of a publicly owned network. “ This report highlights five arguments for public ownership:

1. **High-speed information networks are essential public infrastructure:** *Public ownership of the physical network does not necessarily mean the city either manages the network or provides services.*
2. **Public ownership ensures competition:** *A publicly owned, open access network can be open to all service providers on the same terms,*

*thereby encouraging the entry of new service providers.*

**3. Publicly owned networks can generate significant revenue:**

*Telecommunications networks are different from traditional public works like roads because they can be self-financing both in terms of initial construction costs and ongoing upgrades. They can also generate revenue for local government, reduce the cost of government services, or keep more money in residents' pockets with lower prices.*

**4. Public ownership can ensure universal access:** *Publicly owned road, water and sewer, and sidewalk networks connect all households without discrimination. ... Private companies, on the other hand, have incentives to upgrade their networks only where it will be the most profitable.*

**5. Public ownership can ensure non-discriminatory networks:** *With publicly owned networks, customers can be sure that any traffic management mechanisms are necessary and not simply to improve profitability. Communities can insist on neutrality from any service provider that uses the network. Or, if the market is large enough to support multiple service providers, a publicly owned network can leave neutrality to the market, knowing that unhappy customers can easily change service providers.*

Ownership matters. ...Public ownership of the physical infrastructure may be the only way to guarantee future competition. It is clearly the only way that communities can influence the design of their future information systems. And public ownership can allow a community to tap into the growing exchange of information to generate significant revenues while enabling all households in the city to have affordable access.



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