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Introduction

The Remote Rural Broadband Deficit in Canada

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In December 2012, The Monieson Centre, Queen's School of Business, was host to an international conference, "Connecting the Future: Rural Broadband Technology, Policy and Impact". Six papers from the conference that deal with the remote rural broadband deficit in Canada are being presented in this special edition of the *Journal of Rural and Community Development*. Collectively, they draw together three important themes: *availability* (Razabiun and Middleton; McNally and Trosow; Ashton and Girard), *adoption* (Hudson; Carpenter et al.; Ashton and Girard) and *impact* (Chowdhury and Hambly Odame; Hudson).

The *availability* shortfall results largely from the failure of the marketplace to supply remote rural markets, which lack population density and infrastructure sufficient to generate adequate financial returns to providers. The Canadian government has yet to formulate a national broadband strategy; however, it has attempted to address remote broadband *availability* with targeted funding initiatives. The greatest burden, though, has fallen to provincial governments whose strategies have taken the form of *public private partnerships* that attempt to fuse public policy with private sector implementation. Much has been achieved, but sometimes at levels of performance quality that fall below standards acceptable in other developed countries. That said, even success in terms of broadband *availability* means little unless it is both *adopted* by rural communities and has meaningful social and economic *impact*. So these three issues are first of two organizing themes of this special issue of the *Journal*.

The second theme is *public private partnerships*. Canadian governments often promote infrastructure investment and development through varying forms of partnership that bring together public policy objectives with private sector implementation. Governments have valuable incentives to partner. The first is financial. Governments can free up their own balance sheets (and protect or improve their credit ratings) by allowing investment capital to be raised by the

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private sector partners. Also, they can create budgetary flexibility by sharing program expenditure costs with partners. In turn this opens the opportunity for allocating budgetary resources to other priorities. Second, governments can share with, or allocate to, private sector partners the project design, construction, finance and operational risks. In this way risks can be allocated to those partners best able to assess and manage them. Third, governments are able to leveraging private sector expertise and innovation.

In the process of establishing public private partnerships, governments usually lead in three ways. First is by defining the private sector's functions, for instance by assigning to them varying roles that can include any combination of designing, building, operating, maintaining and owning the asset or entity that is the object of the partnership. Second, the government partner controls how the private enterprises can join the partnership, e.g., by winning bids in tenders or chosen in a sole-sourced procurement process. Third, governments determine their own financial roles, for instance by providing direct investment, grants, or loans; or by ensuring cash flow to the partnership entity in the form of service contracts, purchase agreements and subsidies to purchasers or other stakeholders. The Canadian broadband landscape provides many different partnership arrangements, which are evident throughout the papers to follow.

With respect to the theme of *availability*, in "Rural Broadband Development in Canada's Provinces: An Overview of Policy Approaches", Rajabiun and Middleton explain how the federal government and three provinces structure public private partnerships for rural broadband development and delivery. In the Alberta case, the SuperNet high-capacity fibre and fixed wireless backbone network connects schools, municipal offices, libraries, hospitals and other public facilities. In establishing the partnership, Alberta's financing mechanisms include a combination of direct investment, purchase agreements and funding grants to both local municipalities and network providers to connect households. The main partners are the network owners, Bell Canada and the Government of Alberta, system operator, Axia SuperNet, a private sector company based in Calgary, and the local ISP providers. The structural problem Rajabiun et al. highlight is that the system was not designed specifically to connect the last mile, so rural connectivity depends upon local ISPs. Because the incumbent operator was not selected to build and manage SuperNet, including responsibility for the last mile connections, there is a misalignment between the public policy connectivity objectives and the local ISPs that lack a clear business rationale for investing in the connections in uneconomic rural markets. The government may have achieved certain financial and risk allocation objectives (though we do not know this), but effective leveraging private sector innovation requires that contractual relationships ensure all partners' financial priorities are met.

In British Columbia the partnership was structured in a way that better linked public policy objectives with contractual incentives for private partners to achieve rural connectivity. The incumbent backbone operator, TELUS, was retained as the system operator and contracted to maintain points-of-presence and affordable access to third party ISPs to connect local communities, upgrade network facilities and improve rural broadband speeds. This resulted in a better alignment of partner objectives. In order to finance the partnership, the BC government entered into long-term procurement contracts with TELUS, and allocated small infrastructure grants to local service providers and community organizations. Rajabiun et al. note

the better alignment of incentives between system operator and third party providers, however they also point out that because the government established the partnership by way of a sole sourced procurement contract, rather than public tender, it is difficult to assess the overall cost effectiveness of the BC partnership.

Ontario's approach contrasts with both Alberta and BC, but is similar to other provinces and the federal government. Again, it is a public private partnership model with the provincial government leading with policy followed by private sector implementation. The Rural Connections Broadband Program was designed to cover one third of the capital costs for underserved rural areas with private providers contributing the remaining two thirds. The financing was provided in the form of variable subsidies based on the size of the community. This is very similar, as Rajabiun et al. point out, to the federal government's Connecting Rural Canadians program (2009) except that it financed up to fifty percent of costs and provided much larger subsidies than Ontario.

In the analysis of each provincial and federal program, Rajabiun et al. point to the challenges of obtaining data to evaluate programs fully. However, in Ontario, where more detail is available, they establish an empirical model to account for capital expenditures to provide access across diverse rural communities.

The Canadian government has been reluctant to use its regulatory powers to intervene in the commercial marketplace to encourage rural broadband infrastructure investment. However, the federal government has asserted itself in terms of foreign competition regulation with the unfortunate result being protection of the dominant incumbents. Here McNally and Trosow provide insight in "The New Telecommunications Sector Foreign Investment Regime and Rural Broadband". They are very critical of what they take to be the market-oriented bias of telecommunications policy in Canada given the high potential for market failure in rural environments. They quote the Telecommunications Act (1993): "to foster increased reliance on market forces for the provision of telecommunications services and to ensure that regulation, where required, is efficient and effective.", and regarding government direction to the Canadian Radio and Telecommunications Commission (CRTC), "to rely on market forces to the maximum extent feasible as a means of achieving the telecommunications policy objectives."

McNally et al. explain that a "major issue with Canada's approach to broadband is the lack of a clear, coherent plan." They tell us that both Industry Canada and the CRTC want to increase rural broadband availability. The problem with the CRTC's performance threshold is that it is very unambitious with respect to download and upload speeds – well below that of other comparator countries such as Australia. One of the key drivers of competition that could promote rural broadband development relates to foreign entry into Canadian markets, but here the federal government's ownership restrictions suffer from indecision. The authors express concern that there is no clear indication of when a decision will be made on the Telecommunication Policy Review Panel (2006) recommendation of scraping foreign investment restrictions entirely, as many countries have done.

However, market liberalization is not enough to promote availability, adoption or impact. The private sector and market forces cannot be relied upon without a national plan, as in both Australia and the United States. Private sector partners will not service rural markets where this is not a business case. They point to the

U. S. national *Connect America Fund* as an example of what could be done. To be successful Public private partnerships require both strong public policy and a strong regulatory underlay.

The third paper, "Reducing the Digital Divide in Rural Manitoba: A Proposed Framework", by Ashton and Girard, provides a bridge between the themes of *availability*, and both *adoption*, and *impact*. The authors describe a Manitoba case study in which the public private partnership is highly inclusive because it involves youth and citizens, along with various levels of government, IPS and local businesses. Ashton et al. present an action-oriented model that links access (availability), users (adoption) and uses (impact). Whereas Rajabium et al. and McNally et al. both provide public policy analyses, Ashton et al.'s paper presents a model for community action. They develop a community-based rural development framework for inclusive collaborative partnerships, called an *integrated action framework*.

In their framework, *access* to broadband is achieved by a cluster of communities in partnership with an ISP, whose business case includes public sector partner funding support. The incentive for the public sector combines the policy commitment to provide broadband with budgetary savings for governments from reduced flights for health services, improved access to e-government services and reduced travel costs for government agencies. The second component of the framework is *users* (adoption) in which a key partner must be a heavy data user, such as a hospital or school, which can act as an anchor. Other community business and household users are then appended to the anchor. Third are *uses* (impact) for the services, which are commercial/economic and social opportunities and outcomes. What enables the framework to be effective is government participation, and leadership in each part of the model.

The model has general applicability across Canada to under-serviced communities. It is important to be realistic about timeframes, though, because implementation can take years. Equally, strong partners are needed. And apathy among ISPs is a potentially limiting factor. Still, as successful partnerships develop, other communities will see the benefits and be motivated to establish their own based on the action-oriented framework.

Hudson, in "Beyond Infrastructure: Broadband for Development in Remote Indigenous Regions", makes a very strong case for considering the importance of *adoption*, not simply *availability*. To this end, she develops a framework for *adoption* that is based on geographical, economic and cultural environments of indigenous communities in Alaska and Northern Canada.

Hudson builds her case by reminding us that "true access involves more than availability; it also includes affordability and adoption". After all, the benefits of broadband give value to having access to it. Hudson's research framework is built on personal, household, community and institutional uses. In addition to a broadly-based literature review, she conducts a random telephone survey in sixty-five remote communities in southwest Alaska. She then compares policies in Alaska and Northern Canada.

Hudson has much that is encouraging to report in terms of *adoption* but faster connectivity is needed in both for family, social service and economic reasons. *Adoption* has been strongly influenced by engaging native organizations directly. She notes, "no other regulator in the world that has required carriers to consult

with indigenous representatives in order to receive subsidies for serving their communities." Hudson concludes on the linkage of *adoption* to *impact* with the comment that "many applications of broadband by rural residents, social services, nonprofit organizations, and commercial enterprises can contribute to economic growth and diversification, and to improved delivery of services and access to educational resources in remote communities."

In the next paper, Carpenter, Gibson, Kakekaspan and O'Donnell further develop the theme of *adoption*. In "How Women in Remote and Rural First Nation Communities are Using Information and Communication Technologies (ICT)", they provide a detailed analysis of how rural broadband is used across many remote communities. The authors survey approximately two hundred and thirty women, ranging in age from seventeen to more than seventy years of age, living in rural First Nations communities in Northern Ontario to determine personal, health and wellness and cultural preservation uses of broadband. Their investigation is less concerned with the level of *adoption*, since the subjects are already Internet users, than with how and for what purposes it comes about.

First Nations women are specifically chosen for this study because of their strong traditional role of guiding family and community success as mothers, elders, educators, students, health service providers, and leaders/councilors. The subjects are located in the Sioux Lookout zone, a region containing approximately twenty-five remote First Nation communities, which range in population from sixty to two thousand people and covers a geographical area about the size of France. Internet connections are managed primarily in collaboration with Keewaytinook Okimakanak (KO-KNET). With the introduction of new IT solutions and fibre networks, service is gradually being upgraded to 10MB and 100MB circuits. Within the overall study, Carpenter et al. profile the women in the Slate Falls First Nation.

The results show active *adoption* not only for social purposes through social media for personal and family communication and cultural preservation, but also for education and telemedicine. As Carpenter et al. say, "it is evident that women in rural and remote communities in Northern Ontario have been energized to take ownership in the way broadband and ICT applications are used to complement the way they raise their families, support their communities and tell their stories."

The study contributes to our understanding of public private partnerships, by showing how communities can work effectively with the system operator, in this case to expand the cable network to replace satellite, which provides significantly increased Internet speeds. Importantly as well, the community partners retain local ownership and control of equipment and services including the Internet and videoconferencing. In this way, the last mile connection strategy is aligned with those of both the operator and provider. There is recognition as well of the importance not only of community ownership to generate income, but also of local technical support capacity building for sustainability of the model. It reminds us of Rajabiun et al.'s observations about how British Columbia's partnership structure makes the operator-community relationship easier to manage than in Alberta. Carpenter et al. describe a relationship process that would at least partly fit the model recommended by Ashton et al. with respect of complementary objectives and shared interests.

The final paper examines *impact*. In "Social Media for Enhancing Innovation in Agri-food and Rural Development: Current Dynamics in Ontario, Canada",

Chowdhury and Hambly Odame cast doubt on the commonly held presumption that social media, e.g., Facebook, Skype, Linkedin and Myspace, are *necessarily* conduits for innovation. As channels of communication, these tools seemly should promote collective learning processes and knowledge creation. But in a study of fifty on-line communities in the rural agri-food sector in Canada, though mainly in Ontario, which has one quarter of Canada's farms and is the largest agricultural and food producing sector in the country, Chowdhury et al. employ multiple database searches, literature review and content analysis. They find little evidence to support *impact*. Explanations for this could be *availability* issues related to access and capacity. Or the challenge could be *adoption*, arising from what the authors point out are concerns about privacy, security and property rights. They conclude saying: "Social media do play a role in making information available, but there exists no sufficient evidence, in the context of agriculture and rural development, of their role in building dialogue and taking action to solve problems and innovate."

Taken together, these six papers present a comprehensive view of three crucial measures of what gives value to broadband in rural Canada, namely *availability*, *adoption* and *impact*. In this country, we have sought to improve these aspects of broadband policy and implementation through *public private partnerships*. The research studies presented here demonstrate the many ways that partners can be contractually linked to achieve differing objectives. The authors give us much to think about in terms of how effective these partnership relations have been, or could be in the future. My co-editor, Dr. William Ashton, Brandon University, and I are pleased to present this special edition of the *Journal*.