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Local Communities and Home Rule: Extending the Alberta SuperNet to Unserved Areas

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Introduction

In 2000, the Government of Alberta, Canada, announced its intention to build a province-wide fiber optic network to provide its residents with the “infrastructure for high-tech, knowledge-based business” (Province of Alberta, 2000, p. 437). The government undertook the task with two private partners and construction occurred between 2001 and 2005. Alberta’s SuperNet project, an open access network, extended fiber optic cable to all towns, villages and hamlets in the province. The network terminated in schools, libraries, hospitals and provincial government offices (Cherry, 2004). The government never intended to bring fiber-to-the-home, as its design strategy was to create entrepreneurship opportunities for Albertans, including internet service provision (Alberta, n.d.). The province constructed the fiber optic pipeline that would carry applications, including privately provided internet service (Province of Alberta, 2002; Province of Alberta, 2004) and charged \$50 Canadian a month per megabit per second (Mbps) of bandwidth, regardless of location (Cherry, 2004). The government argued internet service providers (ISPs) would compete with each other for customers (Province of Alberta, 2002). This design strategy was one of the unique features of the private partners’ winning proposal and the Institute of Electrical and Electronics Engineers (IEEE) celebrated this business model (Cherry, 2004).

The SuperNet is an example of Gurstein’s “competitive innovation,” which supports “competitive positioning in hyper-competitive commercial marketplaces” (2013). Gurstein (2013) notes there is another, less recognized form, “community innovation,” where communities seek to effectively respond to changing circumstances. In rural Alberta, despite initial interest to provide high-speed internet (HSI) service, private companies did not serve all communities. The small size of some communities made it difficult for private ISPs to develop a profitable business case (Adria & Brown, 2012; Kozak, 2010). The Government of Alberta’s top-down approach to the SuperNet, however, created opportunities for bottom-up community innovation.

This research asks if Alberta communities unserved by commercial providers initiated local approaches to internet provision. If they did, how did they address their lack of access? Were these approaches successful and what made them so? Research found some communities devised local innovations to provide HSI, using three strategies: county-wide municipal initiatives, construction of infrastructure, and use of existing resources. The five areas employing these approaches all successfully brought HSI access to their communities, but not all remain community owned and operated. Research found that in rural Alberta, the top-down policy of the SuperNet added to bottom-up community initiatives created a successful formula for providing HSI access to unserved areas.

The legal concept *home rule* is a helpful one for thinking through the relationship between the provincial government and local communities on the issue of internet provision. Schiller (1998) labelled the independent and municipal telephone systems in the twentieth century United States as examples of home rule. According to *Black's Law Dictionary* (1990), *home rule* is a "state or constitutional provision or type of legislative action which results in apportioning power between state and local governments by providing local cities and towns with a measure of self-government if such local government accepts the terms of the state legislation" (p. 733). The larger, overseeing government thus grants *home rule* to a smaller, local organization that then has self-determination (Munro, 1930). *Home rule* is a particularly fecund concept for analyzing the development of local solutions to high-speed internet provision in Alberta because it establishes a relationship between states and localities, where each has responsibilities, and it prompts an examination of how particular localities respond to a common problem.

This paper begins with a review of community informatics literature relevant to the cases presented, followed by a description of the research site and methods used. It then describes and analyzes three local approaches taken to expand HSI to unserved regions in rural Alberta. Finally, the article concludes with a discussion of the importance of this work for community informatics research and community First Mile initiatives in practice.

Literature Review

Community informatics (CI) is a research approach centrally concerned with communities left out of the rapid development of information and communication technology (ICT) (Gurstein, 2000; Keeble & Loader, 2001). CI explores a diverse array of initiatives designed to provide ICT access, tools, skills, and content to unconnected groups and communities, enhance community participation, and allow for economic development (Gurstein, 2007). This approach forefronts "the social and cultural factors shaping the development and diffusion of new ICT and its effects upon community development, regeneration and sustainability" (Keeble & Loader, 2001, p. 3). Access is a primary focus of community informatics as it is required to foster a community's other goals, be they political, economic, or social (Gurstein, 2000). Two important levels of access for community informatics are carriage facilities, the base level of digital information infrastructure, and service provision, or access to an ISP, to provide internet connectivity

(Clement & Shade, 2000). Scholars examine how communities develop the organization providing ICT access and how they create a context to optimize the use of the technologies (Gurstein, 2000).

A common characteristic of community informatics research is its bottom-up approach to community development (Gurstein, 2007; Heaton et al., 2013). The field describes and analyses how people and institutions come together to work on common problems (Bishop & Bruce, 2005). Some work has found that top-down policy approaches, such as the European Union's approach to ICTs, fostered bottom-up community informatics initiatives (Cawood & Simpson, 2000). This focus on bottom-up innovations leads CI to study ICT development at the community level (Gurstein, 2000). Community informatics, therefore, connects cyberspace and physical locations and scholars view ICTs as "geographically embedded" (Loader, et al., 2000, p. 81). CI scholarship explores the local development of ICTs in specific, geographic communities, describing and analyzing the unique approaches taken to resolve problems. The field, thus, creates thick descriptions of diverse local approaches and their social contexts (Gurstein, 2007).

Since the announcement of the Alberta SuperNet, scholars have studied the network and people's understandings of it. Mitchell (2007) explores SuperNet development and its promise, but argues some communities "will not be able to secure the full benefits of the network" (p. 263). Carrying out public consultation using a Constructive Technology Assessment approach, Mitchell (2007) looked into extending the SuperNet into aboriginal communities in northern Alberta. He found multiple levels of barriers, including technical, jurisdictional, economic, and socio-cultural challenges, to extending service. Adria and Brown (2012) interviewed stakeholders in rural Alberta broadband to discover how they made sense of the last mile and its challenges. The interview participants indicated that grassroots community movements were necessary for the provisioning of rural broadband. This research builds on these findings and explores communities that overcame the barriers and developed rural HSI initiatives.

Methods

This study employed a qualitative ethnographic approach based on case studies of three counties in rural Alberta, hereafter called the northern, central, and southern counties. It is based on nine semi-structured, face-to-face interviews conducted with the community actors at the heart of the local broadband initiatives, local and regional administrators, and government officials. The author recorded and qualitatively analyzed the interviews. Each interview was between one and three hours long. Additionally, the research used provincial and regional government documents. The five cases discussed were the only community initiatives in the three counties.

The analysis is part of a larger ethnographic study carried out in the three counties between October 2006 and January 2007, where the author lived in the counties, conducted 73 interviews, and was involved in participant-observer research. Interviewees included provincial government representatives, local and regional government representatives, institutional

actors such as school officials, librarians, and health care administrators, as well as rural and town residents (Kozak, 2010).

Local Solutions to High-Speed Internet Provision

County-Wide Municipal Initiatives

The first method of extending HSI within a region is county-wide municipal initiatives to overcome provision issues, the option selected by the northern and southern counties. The municipal governments chose to extend the SuperNet connection and make high-speed internet available to all residents without waiting for private companies to arrive. Both counties found that while the SuperNet offered reasonably priced internet backhaul, telecommunications companies were not willing to provide service to the rural areas of the counties (Economic Development Officer [EDO], southern county, interview, October 23, 2006; Chief Administrative Officer [CAO], northern county, interview, December 5, 2006).

To overcome this issue, in 2002, southern county officials decided to provide modestly priced internet service to their residents. The decision to bring line of sight wireless service to residents occurred after the county office surveyed its inhabitants. The county's economic development officer noted respondents identified high-speed internet availability as *"high priority."* Although only *"approx[imately] 12% [of] the households"* completed the survey, *"This gave us enough to build the business case; we now have approx[imately] 15-20% of the households and businesses signed on"* (EDO, southern county, fax communication, January 11, 2007). To provide high-speed internet, the county's economic development society partnered with a private ISP based in Calgary, a large metropolitan center 300 kilometers to the south, reaching an agreement for 25 years. The county built and owns the towers and provided the transmitting equipment and the ISP manages the system and interacts with customers (EDO, southern county, interview, October 23, 2006). This was a lucrative deal for the ISP because the county funded the most costly aspects of the venture, building the towers and buying the equipment.

The wireless network has six towers in the county and two transmitters in a neighboring county because it *"wasn't cost prohibitive"* to install them. The partnership provides service to the county's rural and urban areas. The economic development officer argued *"the only way rural residents get service is if they step up to the plate and make sure it's put in place."* He stressed that theirs is a local, community-driven initiative. He stated while ISPs want quick returns, the county can *"afford to be patient"* and amortized the cost over ten years (EDO, interview, southern county, October 23, 2006). In 2006, the municipal-private partnership had 200 customers.ⁱ The official reported a customer satisfaction survey in January 2006 found the *"overwhelming majority"* was *"tickled pink and extremely grateful"* but *"one or two [were] less than satisfied"* (EDO, southern county, interview, October 23, 2006).

Some did question the county's approach. Critics argue the county accepted too much of the financial burden. The region's Member of the Legislative Assembly (MLA) noted while he gave

the municipal way *“a lot of credit,”* he was *“not very happy”* because the southern *“county gave taxpayer money”* to the ISP in a *“bottomless pit.”* The MLA stated the southern county did not cap the amount available for the project and he worried taxpayers were going to pay for cost overruns and excess to the private provider. He also suggested the county had a *“bone to pick with private sector business, especially local ones,”* and as a result, it contracted with an ISP from Calgary, rather than a local business (MLA, interview, November 17, 2006).

By April of 2008, the southern county had hired a new economic development officer, whose reports to the county council suggest the broadband partnership was not a panacea. In his first report, the new officer noted, *“We are presently continuing to upgrade our equipment for the internet system to ensure that service levels are more reliable. As well we are having discussions with [the ISP] to ensure that our customers’ expectations are met”* (County, 2008a). Over the next months, upgrades occurred to improve service and the economic partnership society planned to construct a new tower to further extend service (County, 2008b; County, 2008c). Additionally, the economic development officer wrote residents ought to contact him if they were encountering difficulties getting issues resolved with the ISP (County, 2009).

The northern county also decided to bring HSI to its residents, by expanding the mandate of its municipal corporation to include broadband provision (Municipal corporation general manager [GM], northern county, interview, October 30, 2006). The municipal corporation embarked on a joint venture with a private company to provide internet service to rural and urban residents. The venture began as a for-profit, tax-supported initiative. The northern county dedicated up to \$800,000 Canadian to provide internet access to the ratepayers, particularly those in rural areas. The municipal corporation’s general manager noted large companies tended to *“cherry pick”* and exclusively serve urban communities; in contrast, the county’s chief administrative officer argued, *“we want to make sure everyone has access”* (CAO, northern county, interview, December 5, 2006). In the initial plan, the ratepayers owned the municipal corporation through the county council and eventually, the municipal corporation and private company were to amalgamate and the ratepayers would own the resulting corporation. Local ownership of the Wi-Max infrastructure and service was one of the county’s priorities (CAO, northern county, interview, December 5, 2006). The profits from internet service were to be kept in the county rather than exported to a private company’s coffers (Municipal corporation GM, northern county interview, October 30, 2006).

Residents and businesses allowed the municipal corporation to install communication equipment on their seed cleaning plants, fertilizer plants, and grain elevators in exchange for free internet, thus allowing the municipal corporation to save \$10,000 Canadian per tower (Municipal corporation GM, northern county, interview, October 30, 2006).

This partnership started offering limited service in July 2006 and had over twenty subscribers, or less than one percent of the county’s population, by the end of the year (CAO, northern county, interview, December 5, 2006; municipal corporation GM, northern county, interview, October 30, 2006; Beaver, 2006; Statistics Canada, 2007b). By September 2008, the service expanded to 365 customers, or over ten percent. Additionally, the northern county added

three new towers (Beaver, 2008). Despite the initial vision of community ownership, the county sold the broadband network to a private company in 2010, which now provides broadband service to county residents (Yaremchuk & Annicchiarico, 2010; Beaver, 2010).

Construction of Infrastructure

The second solution used to expand high-speed internet within a region is providing the necessary infrastructure to entice companies to offer service. In the central county, two businesses operating on the outskirts of small towns found that after SuperNet construction, they remained without high-speed internet. The central county, unlike its northern and southern counterparts, decided to leave HSI provision to private companies (County official, central county, interview, October 24, 2006). In one case, an automotive dealer located in a town with a population of 743 in 2001 required access to broadband internet (Statistics Canada, 2007a). In the other, a local branch of the electric company found itself the only service point of 37 in the region that remained on dialup in August 2006. Both the car dealership's general manager and the electric company's senior serviceman decided to investigate the lack of ISPs in their areas. The general manager talked to approximately eight companies and learned there were no providers coming to town "*in the short-term future*" (Automotive general manager [GM], central county, interview, November 15, 2006). The ISPs revealed that no one was "*interested to put out money to build a tower*" for line of sight wireless transmitters. The manager discovered that gaining the "*expertise to set up a wireless network is not something that I could do*" but investing in infrastructure to entice ISPs was a practicable solution. The car dealership, therefore, paid for the tower and had the infrastructure installed in October 2005. After this, a few ISPs contacted the general manager, interested in providing service to the town because the tower decreased their set up costs. He leased the tower to an ISP for ten years and expects to earn slightly more than he spent, making a small profit in addition to providing a "*service to the community.*" By late 2006, the general manager noted "*at least 75*" homes in the town and its surroundings signed up for HSI service (Automotive GM, central county, interview, November 15, 2006; Town, n.d.). This solution is limited; however, as those located over 25 kilometers from town cannot access the service (Town librarian, central county, interview, November 22, 2006; Automotive GM, central county, interview, November 15, 2006).

The electric company's senior serviceman found only one ISP willing to provide high-speed internet to his location; the southern county's ISP, discussed in the previous section, which had equipment in the area. To obtain service, the electric company paid for the "*whole install*" of an \$11,000 Canadian transmitter that reached the ISP's nearest tower in a farmer's field. In return, the electric company's office received three years of free internet service (Senior Serviceman, Electric Company, central county, interview, December 21, 2006). Rural residents in the immediate area can also subscribe to the wireless internet service. The car dealer and electric company's experiences illustrate that local entrepreneurs with adequate financial resources do develop solutions to extend broadband internet, but neither worked with their communities to do so.

Employing Existing Resources

The third solution studied delivers high-speed internet to a village in the central county through its community cable system. The community formed a society in 1991 to provide residents with cable service. A society member, realizing that the SuperNet's fiber optic cable ran in front of his home, wondered why he could not get high-speed internet. Providers, however, did not extend the service to a village of 161 people (Statistics Canada, 2007a). The society member researched the issue and found the village office's SuperNet point of presence could be connected to the existing coaxial cable system using a media converter and an ISP (Cable society member, central county, interview, December 7, 2006). The society borrowed \$8,000 Canadian from the village to fund the venture (Marck, 2006). The society's members agreed to the plan but the former president resigned, arguing HSI service would not be profitable and cable would end up subsidizing the internet. By late 2006, the society offered high-speed cable internet to homes and businesses for \$40 Canadian a month and the society member noted *"now we have more revenue than cable."* His goals, however, were not altruistic. As a recent transplant from a large city, he stated *"I want to ensure that there's a facility available so I can have internet."* He admitted his was not a desire to see everyone connected rather this was a positive externality (Cable society member, central county, interview, December 7, 2006; Marck, 2006). In 2006, 28 community members, or seventeen percent of the village population, connected to the internet (Cable society member, interview, December 7, 2006). As distribution occurs through the cable system, this approach is limited to homes in the village. The village's administrator stated the community's high-speed internet venture is an *"important part of the fabric of the community,"* illustrating the village's *"can do"* spirit (central county, interview, December 14, 2006).

Analysis

The five local HSI initiatives studied can be considered successful because each met their goal of bringing HSI to previously unserved areas. There are, however, some caveats to discuss. While the three micro initiatives led by the cable society member, automotive general manager, and senior serviceman extended HSI to an entire village, town, and unserved region south of a town respectively, the two county initiatives had more qualified success. A 2011 report found service gaps in both counties. In the northern county, 9 of 41 townships remained without service and in the southern county, 22 of 40 townships did not have HSI (Bly, 2011). Additionally, the northern county's goal of community ownership of the broadband network did not come to fruition as the county sold the network to a company located outside of the region. Broadly, however, the local initiatives have extended HSI and have been sustained, a concern of CI approaches (Keeble & Loader, 2001).

The local initiatives considered above share four common elements, which were keys to their success. These shared characteristics are access to the SuperNet, a *lead user* to shepherd the process, community and ISP involvement, and financial support from business and/or local government.

Scholarly work has illustrated that government support and partnerships are needed to develop telecommunications infrastructure when a viable business case is not possible (Ramírez, 2001). As it did with telephony at the start of the twentieth century (Love, 2005), the Alberta Government facilitated ICT expansion at the start of the twenty-first. The availability of the Alberta SuperNet in the province's towns and villages enabled the five local solutions. The SuperNet business model provided communities a cost effective way to deploy high-speed internet and each initiative connected to a SuperNet point of presence that provided broadband infrastructure. Thus, the province provided carriage facilities and the local initiatives ensured ISP access (Clement & Shade, 2000). As Cawood and Simpson (2000) found, in these cases, the top-down government decisions enabled bottom-up community initiatives. The government's legislative action, building the SuperNet but not extending fiber to homes, gave localities power to decide how to provision the First Mile (Black, 1990).

CI explores how people and institutions within communities work together on common problems (Bishop & Bruce, 2005). This study has done so, and in the process found that each of the community initiatives had one individual who spearheaded the project. The county initiatives each had an employee who conceived of, and worked toward, the solution. In the northern county, the general manager of the municipal corporation took on this key role. In the southern county, it was the purview of the county's economic development officer. In the other three projects, the cable society member, automotive dealer's general manager, and the electric company's senior serviceman were the central figures. These three were *lead users* in Von Hippel's sense, people who realize a need in advance of the general population and who are positioned "to benefit significantly by obtaining a solution to those needs" (as cited in Van Oost et al., 2009, p. 185). The auto dealer's general manager and the senior serviceman each had corporate ties to facilities that pressed upon them the need for, and convenience of, high-speed internet. The cable society member knew of the benefits of HSI from service at his previous residence. While county employees and *lead users* played a central role, some of the initiatives sought community support for the plans. The village cable society's members voted on whether to provide internet service through the cable system and residents of the southern county had an opportunity to respond to a survey, although only a minority did. In the northern and southern counties, people offered grain elevators and other structures as locations for mounting equipment. Other CI research illustrates there is a role for wider community involvement in local initiatives (see, for example, Powell & Shade, 2006; Gurstein, 2007). Additionally, each community initiative paired with a private ISP to bring HSI to their locations.

While securing the necessary funding can be an issue for rural HSI provision (Mitchell, 2007; Adria & Brown, 2012; Kozak, 2010), the community initiatives above were successful at finding money. The third common element is the financial support of businesses and/or local government. Each of the local initiatives received funding from a corporate or municipal source. Both the auto dealer's general manager and the electric company's senior serviceman secured corporate funds to build infrastructure. The northern and southern counties drew on municipal monies to build towers and install equipment. The village cable society received a loan from the village council to carry out its plans.

While the local initiatives discussed here expanded HSI to unserved regions, in 2012, the government announced only 260 of the 429 SuperNet communities had an ISP seven years after the network's completion (Government of Alberta, 2012b). In response, the provincial government created the Final Mile Rural Connectivity Initiative to "ensure reliable, high-speed internet is available to at least 98 per cent of Albertans" (Government of Alberta, 2012b). The initiative provides \$5 million Canadian to fund rural First Mile projects proposed by municipalities, aboriginal bands, and Métis settlements. Private businesses and not-for-profit organizations may not apply, unless partnered with a municipality, band, or Métis settlement (Government of Alberta, 2012a).

Conclusion

This research examines resourceful individual and community First Mile initiatives in five towns, villages, and counties to provide local residents and businesses with high-speed internet. Alberta's SuperNet design strategy divested the power to decide how to extend high-speed internet service to the final mile onto local businesses and communities. This approach allowed communities to adopt unique local solutions using their particular infrastructures, resources, and understandings of the public good, allowing for *home rule*. The successful local initiatives illustrate that partnerships between individuals, businesses and communities, the support of local government, the presence of *lead users*, and top-down actions that enable bottom-up initiatives can successfully combine to provide high-speed internet in unserved rural communities; findings that are relevant to both community informatics research and future First Mile initiatives in practice.

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ⁱ In 2006, the county contained 680 private households (Statistics Canada, 2007c). If the only internet subscribers were households, 29.4% would have had HSI connections. It is most likely, however, that some were businesses.