



CWIRP – COMMUNITY WIRELESS INFRASTRUCTURE RESEARCH PROJECT¹

Authors: Barbara Crow and Tammy Miller²

Île Sans Fil Case Study

¹ Production of this case study has been made possible through a financial contribution from Infrastructure Canada. The views expressed herein do not necessarily represent the views of the Government of Canada.

² The authors thank Michael Lenczner and Alison Powell for their contributions to this case study.

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www.cwirp.org

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1. Introduction

1.1 Brief Case Study History

Île Sans Fil (“Island Without Wires”, www.ilesansfil.org) is a non-profit organization operating a network of free wireless access points (or hotspots) in public locations across Montréal, Québec, Canada. Founded in 2003, the organization is dedicated to the development of a free communication infrastructure to strengthen local communities in the greater Montreal region:

Île Sans Fil (ISF) is both a technical development project and a grass roots community group, involving professionals and students from diverse fields. The vision of the group is to use new technology, in particular wireless technology, to empower individuals and to foster a sense of community.³

Île Sans Fil is working on two infrastructure projects to provide city-wide wireless networks. The first is the deployment of free Internet hotspots in public spaces, such as, cafes, restaurants, bars, libraries, funeral homes, doctors’ offices, BIAs (Business Improvement Agencies), parks and sections of popular commercial streets. The second is the creation of a high-speed rooftop-to-rooftop wireless network open to everyone in the metropolitan region allowing ISF to disseminate art and cultural content in public spaces.⁴

Île Sans Fil is a bilingual organization working with French and English organizations with largely Francophone volunteers. Members of Île Sans Fil believe that technology can be used to bring people together and foster a sense of community. In pursuit of this goal, Île Sans Fil uses its free public access points to promote interaction between users, show new media art, and provide geographically- and community-relevant information.⁵

In many ways, Île Sans Fil is the product of specific technical and social cultural practices rooted in Quebec. There has been a significant and long history in Quebec of community-based technology projects (community radio, artists’ galleries) and it is this context of community engagement with technology that has influenced the development and positioning of ISF.⁶ In late 2005, ISF encountered possible diffusion of its network by various levels of government and telecommunication companies interested in developing a city-wide municipal network in Montreal. As a result of these representations, ISF made a concerted effort to increase its number of hotspots. ISF agreed that an increased presence could play a role in facilitating the location and delivery of free and public Wi-Fi networks. To date, neither government nor telecommunication Wi-Fi networks have materialized. ISF’s organization is one of the largest Wi-Fi networks with a commitment to not only make its network seamless and transparent, but also as a site for community engagement.

1.2 Mission Statement and Goals

Michael Lenczner, one of the founding members of Île Sans Fil states: [Our] main goal to start off with ... was free public wireless, free wireless in public spaces, and using the technology to create and support local community...⁷ Île Sans Fil 's mission has three distinct, but complementary, aims. First, Île Sans Fil is dedicated to the promotion, installation, and support of public access to wireless Internet access on the island of Montreal. Second, Île Sans Fil is working on creating and maintaining a wireless metropolitan community network that is accessible to everyone, free, and secure. Third, Île Sans Fil promotes content and applications designed for wireless networks.⁸

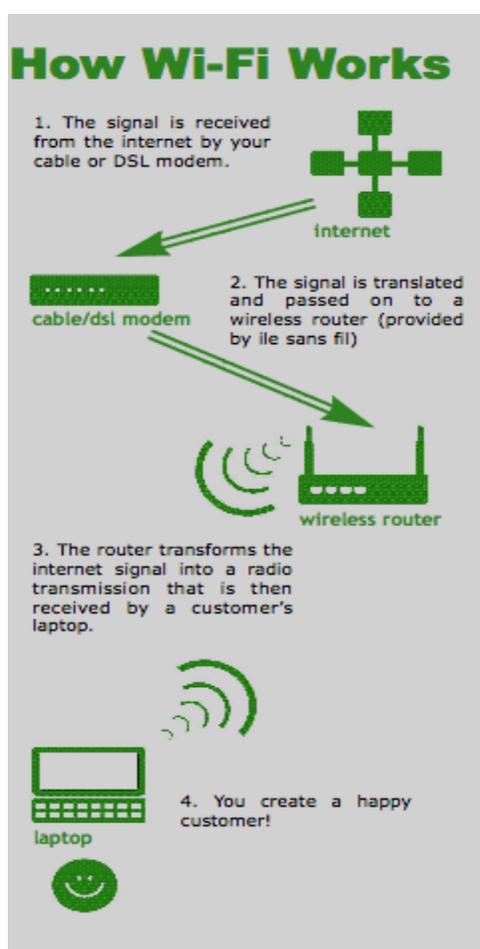


Figure 1

1.3 Network Type

Île Sans Fil is a non-profit organization developing, installing and maintaining a Community Wireless Network (CWN). Community Wireless Networks are local organizations, typically run by volunteers connecting local citizens to local resources and offering free alternatives to commercial service Internet providers. The principles embodied in community-based technological innovation include collaboration, participation, consultation, open access, transparency, democracy and a regard for the public interest.⁹ With a desire to use Wi-Fi technology to cheaply and easily share Internet connections, community wireless networks are characterized by a non-hierarchical organizational structure and in the case of ISF a passionate commitment to community development and technology.

Similarly to other community wireless networks, Île Sans Fil members establish Wi-Fi hotspots in public locations across the city. Figure 1 outlines how the network works. Essentially, each hotspot shares a wired Internet connection through a wireless router reprogrammed with open-source software created by ISF. Hotspots are developed in locations that are accessible to the public such as parks, artist and

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community centres, cafes, bars, restaurants, and public areas of some hospitals and academic institutions. At each of these hotspot locations, the hosting institution signs a “social contract” outlining that they will not charge any of their users for this service. This contract reinforces the relationship between the end user, host and ISF as social service rather than as a commercial one.¹⁰ Île Sans Fil does not charge for installing and administering hotspots; instead ISF relies on businesses, organizations, and individuals to share their Internet connections wirelessly with their clientele and members of the community. As a volunteer-based organization, ISF depends on the goodwill of graphic artists, webmasters, administrators and developers to deploy and sustain its network. This network is made up solely of hotspots provided by members of its community, and the network reach increases as more organizations develop hotspots.

³ <http://www.ilesansfil.org/tiki-index.php?bl=y> (accessed September 30, 2006).

⁴ <http://www.ilesansfil.org/tiki-index.php?page=APropos> (accessed September 31, 2006).

⁵ <http://www.ilesansfil.org/tiki-index.php?bl=y>. (accessed October 20, 2007).

⁶ Powell, A. (2006). *Île Sans Fil as a Digital Formation*, LABCMO, École des Medias, Université du Québec à Montréal.

⁷ Michael Lenczner, interview, June 7, 2006.

⁸ Île Sans Fil brochure “How to use Île Sans Fil free wireless Internet”.

⁹ ICT Infrastructure as Public Infrastructure: Exploring the Benefits of Public Wireless Networks. Paper presented at the 34th Research Conference on Communication, Information and Internet Policy, George Mason University School of Law, Arlington, Virginia, September 29 – October 1, 2006. Catherine Middleton, Graham Longford, Andrew Clement, Amelia Bryne Potter and Barbara Crow.

¹⁰ Powell, A. Forthcoming. "Community WiFi, Resistance, and Making Infrastructure Visible," In B. Crow, M. Longford and K. Sawchuk. Eds., *Sampling the Spectrum*. Toronto: University of Toronto Press.

2. Organization

2.1 Overview

Île Sans Fil has a board of directors, including a president, secretary, and vice-presidents of operations, research and development and communications. ISF has 60 active members who are predominately young, white, well-educated males. Members are engineers, academics, students, technologists, artists and management consultants. Volunteers contribute to the hardware and software development, marketing, communications, public relations and the installation of equipment in public places. The group describes its members as “computer hackers (the geeky-but-cool kind), system administrators, “hands-on” academics, web designers, idealists, engineers and more.”¹¹ Four primary work tasks make up the functions of ISF: networking, coding, coordinating and marketing. In recent research, Powell (2006) has argued that “[o]rganizationaly, ISF has moved from a hierarchy of competing values, couched within an open-source, non-hierarchical organizational structure to a hierarchy where leaders are responsible for different tasks and report to a board of directors.”¹²

The most active ISF volunteers also work as full-time employees, many of them work for telecommunications companies. According to Powell (2006), there is a two-way flow between private and corporate interests of the telecommunications companies and the community oriented approach of ISF. While telecommunications employees may use knowledge gained on the job, the skills they acquire at ISF may also benefit the corporations in which members work.¹³ Île Sans Fil provides a social network and an opportunity for these highly skilled and technically savvy volunteers to work with cutting edge technology and to learn new skills. Moreover, volunteers seem to want to come on board as they have not been technically challenged and ISF enables members to experiment with technology and perform new tasks that they may not be able to do in their paid jobs.

2.2 Partnerships

In addition to the important partnerships with hotspot owners, Île Sans Fil has academic partnerships with the Community Wireless Infrastructure Research Project (CWIRP), the Canadian Research Alliance for Community Innovation and Networking (CRACIN) and L'Université du Québec à Montréal (LabCMO). ISF has collaborated with artists who worked with the Mobile Digital Commons Network (MDCN) and other local artists to display their work.¹⁴ Through this partnership with the Mobile Digital Commons Network projects such as Sonic Scene and DigitalCities have been developed.¹⁵ Île Sans Fil also has a partnership with SDC, a Business Development Association (BDA) in the Gay Village in Montreal. In this partnership, the BDA subsidized coverage and cost of access for other businesses donating.¹⁶

Key players

The founding members of ISF include:

- Michael Lenczner: 27-year-old non-profit and technology worker and a former sociology student.
- Benoit Grégoire: 27-year-old computer programmer with background experience in student government.
- Robert Crecco: 40-year-old part time photographer and first time volunteer.
- Alexis Cornellier: 28-year old computer salesperson and first time volunteer.
- Daniel Lemay: 45-year telecommunications management worker.
- Mina Naguib: 24-year-old full-time self-taught computer programmer.¹⁷

¹¹ <http://www.ilesansfil.org/tiki-index.php?page=ImpliquezVous> (Accessed November 10, 2007).

¹² Powell, A. (2006). *Île Sans Fil as a Digital Formation*, LABCMO, École des Medias, Université du Québec à Montréal.

¹³ Powell, A. (2006). *Île Sans Fil as a Digital Formation*, LABCMO, École des Medias, Université du Québec à Montréal.

¹⁴ Powell, A. *Last Mile? or Local Innovation? Canadian Perspectives on Community Wireless Networking as Civic Participation*, Presented at TPRC annual conference, September 2006, Washington, DC, <http://www.tprc.org/TPRC06/Sat410Sess06.htm#MuniWireless>.

¹⁵ **Sonic Scene**- Using the ISF hotspots in Montreal, Sonic Scene explores and creates personalized, mobile audio, video and textual experiences of the city. Sonic Scene is an artistic intervention into both the physical and wireless city that aims to develop experiential, cultural content and for public wireless reception. For more information see, <http://www.mdcn.ca/tiki-index.php?page=SonicScene>

DigitalCities- This project will create a network database to support MDCN projects as well as conduct research with sensors in the urban environment. ISF will prototype a series of low-cost, task specific, wireless sensors capable of capturing and measuring urban stimuli by sending text, sound, and image over the Internet to a newly established urban database, TRANS.ACT 1.3. The database will house a range of media objects contributed by users that can be modified in relation to the data collected by the sensors and used to trigger events in the database that will activate zones of public dialogue and exchange. For more information see, <http://www.digitalcitiesproject.net/>

¹⁶ Notes from meeting with Alison Powell in February 21, 2007.

¹⁷ Comments from Michael Lenczner November 11, 2007.

3. ICT Infrastructure

3.1 Overview

The Sans Fil's hotspots use 802.11 IEEE Wi-Fi standard equipment and operate within 2.4 Ghz license exempt spectrum. The network is both regulated and closed, meaning that although access to the network is free, users must authenticate themselves on the network by logging in. Although the organization planned to set up a mesh network, it dropped this project as it was too expensive and there was a lack of interest in the group to develop the technology.¹⁸ In addition to establishing hotspots, ISF had also developed an open-source software reconfiguring off-the-shelf Wi-Fi modems that transforms them into nodes in ISF's network. Each hotspot has a unique opening page with places for locally produced artwork, community content, and profiles for users logged onto any location.¹⁹

Inspired by and in response to NoCat,²⁰ ISF developed WiFiDog, an open source portal solution for wireless hotspots. WiFiDog is designed to have optional centralized access control, full bandwidth accounting, node heart beating and local content specific for each hotspot. It does not rely on a JavaScript window and hence, works with any platform with a web browser including personal digital devices (PDAs) and cell phones (Figure 2).²¹ WiFiDog is developed in C++ language and it has been designed for the Linksys WRT54G, but can run on Linux platforms. A typical installation only takes 30kb on i386 and a fully functional installation could be made in fewer than 10 kb if necessary.²² The portal suite is mainly an authentication server (auth-server) coded in PHP using a PostgreSQL database. As well, the WiFiDog gateway connects to the auth-server for directives based on information submitted by users. Administration content is in the authentication server and the gateway is only playing with gateway firewall rules to allow or deny users access.²³ WiFiDog also regulates the distribution of video, music and authorizes users on the network.

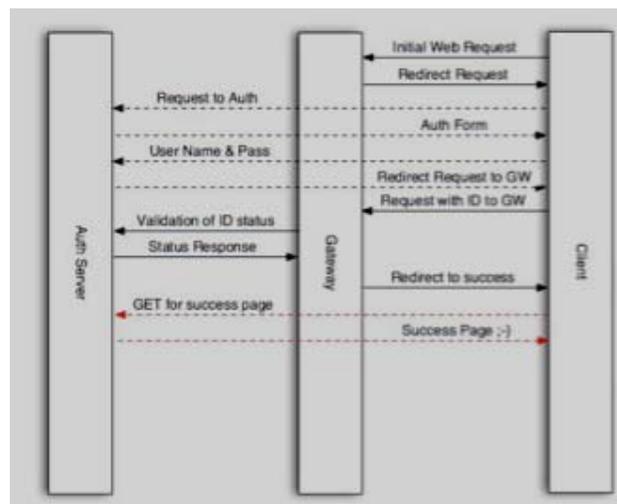


Figure 2: Wifi Dog Flow Diagram

3.2 Role of partners in deploying infrastructure

Most of ISF hotspots have been sought out by small businesses, community members, and outreach by a volunteer sales manager. The network has grown largely the result of word-of-mouth and by the significant local media coverage ISF has garnered (http://www.ilesansfil.org/tiki-view_articles.php). As well, connection to a group of artists and researchers facilitated initial funds to set up hotspots and to support the development of cultural content for ISF's portal page.

3.3 Cost of Deployment

Hotspot owners incur the following costs to provide an ISF hotspot:

- Monthly high-speed Internet connection cost (around \$65/month)
- One-time purchase of Wi-Fi access-point equipment (less than \$100)
- If interested in providing extended network range, a one time-purchase of a Wi-Fi antenna and possibly an amplifier is required.
- Annual ISF network membership (\$50/year) (for servers and administrative costs)

Setup and maintenance is free of charge and provided by Île Sans Fil volunteers. Equipment purchased to provide an ISF hotspot belongs to the purchaser. Île Sans Fil can act as a hotspot “technical advisor,” purchasing equipment on an organization’s behalf and invoicing for the costs, or ISF can advise an organization about the required equipment with the organization obtaining the equipment itself²⁴ (Île Sans Fil, 2006).

3.4 Technical Challenges

Obtaining the hardware and human resources to deploy and support its network is a significant challenge for ISF. In order to address network disturbances and to manage the interface with users, ISF developed WiFiDog. WiFiDog is small (occupying as little as 30KB of flash memory) and allows the equipment cost for a typical site to remain well under \$100. As a result, the combination of WiFiDog and router firmware allows ISF to configure equipment at a new site by just plugging into the existing Internet connection and entering the new router password. WiFiDog allows for the easy remote monitoring of sites through a graphical display of the status and location of each hotspot, sending mail to local support resources assigned to each hotspot in case of fault. The auth-server also allows increasingly decentralized administration and technical support.²⁵ For ISF, technical challenges include the reliability of ISP connectivity to hotspots, “buggy” client hardware that can distort connections and improperly shared Internet connections between host and clients as well as among users.

3.5 Properties of the ISF Network

In May 2007, data on open and closed Wi-Fi networks in the vicinity of ISF hotspots were collected to demonstrate the presence of Wi-Fi networks. Networks on sections of Ste. Catherine, St. Laurent, St. Denis, Ontario, Belanger, de la Roche, and Berri streets were tracked using Netstumbler²⁶ -- these are avenues and streets touched by most of the ISF networks. Figure 3 outlines the number of networks on these streets (observed during the 4 days of data collection in May 2007) as well as the percentage of ISF networks in the areas. Assuming that “open” networks are not restricted in some way (e.g. limiting network access to registered machines), these data suggest that it is relatively easy to find Wi-Fi connectivity in Montreal, either through an ISF hotspot, or by connecting to a personal hotspot that has not been encrypted (“closed”).

Figure 3: Network Data – Summary of Results May 9 – 12, 2007

Location	St. Laurent	Ste. Catherine	Ste. Catherine-Village	St. Denis	Ontario	Belanger de la Roche Berri	Totals
Total Networks per location	595	265	131	234	79	171	1475
ISF Networks	3.4%	2.3%	16.8%	9.8%	1.3%	0.6%	4.9%
Open Networks	31.4%	28.3%	45.8%	44.9%	32.9%	32.2%	34.4%
Closed Networks	68.6%	71.7%	54.2%	55.1%	67.1%	67.8%	65.6%

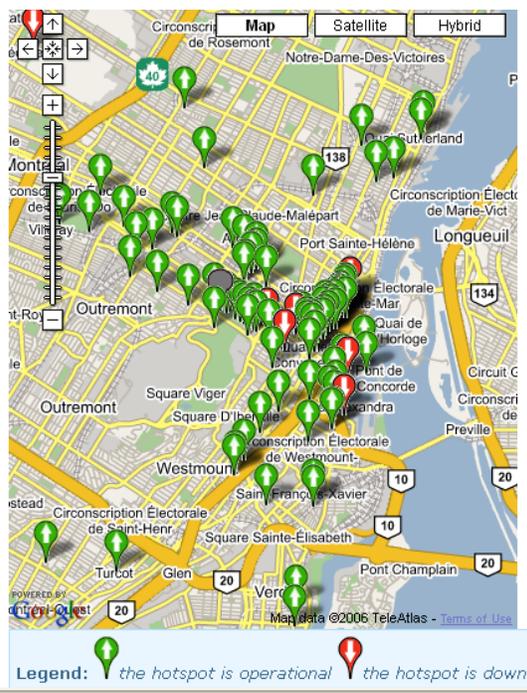


Figure 4: Geographic Range of the Network

To date, Île Sans Fil has implemented over 140 free hotspots and has registered over 45,000 users.²⁷ Figure 4 illustrates the geographic range of Île Sans Fil’s network with each arrow represents one hotspot. ISF hotspots spread north-east from the intersection of highway 15 & 20 and south-west from the intersection of highways 40 & 25 towards the St. Lawrence River.

The hotspot geographic range is 16 km² and there is a cluster of hotspots ranging from 8 km north/south and 5 km east/west. The majority of ISF hotspots are located in the vicinity of the suburbs from Westmount to Mount Royal.

3.6 Does the network offer Quality of Service (QoS)?

What is the organization's philosophy on reliability of the network?

Although ISF volunteers work hard to ensure that the network runs smoothly, the organization seems to work towards best effort. One user stated that, "Here, people seem to understand that this is a basic service. It won't work 100% of the time, but if it does, so much the better!"²⁸

¹⁸ Notes from meeting with Alison Powell in February 21, 2007.

¹⁹ Powell, A. (2005). *The Politics of Visibility: Montreal's Île Sans Fil*. Paper presented at the Association of Internet Researchers, Chicago, USA.

²⁰ NoCat, "NoCat's goal is to bring you Infinite Bandwidth Everywhere for Free," <http://nocat.net/> (accessed February 27, 2008).

²¹ <http://dev.wifidog.org/wiki/About> (accessed September 27, 2007).

²² <http://dev.wifidog.org/wiki/FAQ> (accessed September 27, 2007).

²³ Yeo, J; Kotz, D; Henderson, T. (September, 2007). Île Sans Fil-"Island without wires" In Community Resource for Archiving Wireless Data At Dartmouth CWARD Newsletter.

²⁴ <http://www.ilesansfil.org/tiki-index.php?page=DevenirHotspot>

²⁵ All content in this paragraph is from- Yeo, J; Kotz, D; Henderson, T. (September, 2007). Île Sans Fil-"Island without wires." In Community Resource for Archiving Wireless Data At Dartmouth CWARD Newsletter.

²⁶ <http://www.netstumbler.com>.

²⁷ Interview with Michael Leczner in Yeo, J; Kotz, D; Henderson, T. (September, 2007). Île Sans Fil-"Island without wires." In Community Resource for Archiving Wireless Data At Dartmouth CWARD Newsletter.

²⁸ Powell, A. (2007, June 23). Personal Interview with Bernard Plante.

4. Key Services

What Services does the Organization Provide or Enable?

4.1 Internet Access

The primary service ISF provides is wireless Internet access in public spaces across Montreal. Hotspots have Linksys WRT54G routers running ISF's captive portal suite *WiFiDog* running on top of Linux.

4.2 WiFiDog

WiFiDog is both a gateway for each hotspot running a client process and a web-based central server. As a captive portal, users are required to login and are taken to an ISF webpage (or redirected to portal page where site is located). This application allows hotspots to create and manage their own location-specific content. ISF also has a user profile section allowing users to see who is on-line, where they may be located and information (disclosed solely by the user) about particular users currently on-line.²⁹

4.3 Art and Cultural Content

Through wireless hotspots, ISF disseminates local art and cultural content. In partnership with Terminus 1525 and Wireless Toronto, Canadian artists can exhibit their work to new audiences. Hun d'Artistes Local (HAL) is a technological and cultural project aiming to improve citizens' local cultural connection within Montreal. HAL makes local artists work available via wireless jukeboxes located at select Île Sans Fil hotspots. HAL also brings high-speed streaming of video and audio together with location-relevant media.³⁰ To facilitate Hun d'Artistes Local, a small box is connected to the router that can go over different servers to download music and movie content. Individuals can share local content while they are connected to the server by uploading and downloading text, images, and sound through HAL.³¹

4.4 Political Content

Election07 was another project realized in collaboration between Île Sans Fil and ZAP Quebec (Zone Acces Public, <http://www.zapquebec.org>). The goal of Election07 was to use the free wireless services to engage and inform their users about the 2007 Quebec election. News items were automatically collected from political parties and displayed on the portal pages of ISF and ZAP Quebec. Since the users of the two groups have to pass through these portal pages before gaining access to the Internet, users were automatically informed about the latest news from each party.³²

²⁹ To date, this application has been taken up in four continents and by over 30 groups.

³⁰ <http://hal.ilesansfil.org>

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³¹ Hubs des Artistes Locaux, HAL, <http://www.ilesansfil.org/tiki-index.php?page=HAL&bl=y> and <http://www.halproject.net/>

³² For more information on this project visit: <http://civicsense.ca/elections/quebec07/>

5. Users

5.1 Overview

To acquire an understanding of who uses the ISF network, what services are most widely used and unexpected usage patterns, we interviewed 22 owners and surveyed 13 users in Île San Fil hotspots. This research was conducted on three of the warmest days in May 2007 and many Montrealers were outside and hence, not using the ISF networks (for a list of hotspot use from May 9-12 please refer to Appendix A).

5.2 Who uses the network/services provided by Île Sans Fil?

While we did not find a direct correlation with users and our site visits, there are some generalizations we can make; almost all of the users we interviewed were young white males who work in a freelance capacity as designers, photojournalists and students. There were few women with PDAs or laptops and the one site where we saw the most female users was a site in an emerging and thriving neighbourhood, where there were three women using desktop computers supplied by the café. Hence, just as ISF is largely supported by young white male professionals, so too it seems that the dominant population of network users is similar to its designers.

5.3 What has been expected/unexpected about usage and users?

Some of our data suggest that individuals are accessing Île San Fil's network from locations other than its designated site. For example, at a number of sites we visited, WiFiDog indicated that there were a total of 34 laptop connections and over the course of the four days there were over 224 separate logins to these sites. However, we did not see near this number of laptops or PDAs in these sites. This means that many individuals using the ISF network were not sitting in cafes as the network designers intended, but instead within a range of the network where they could pick up the signal. As Wi-Fi network signals can be broadcast up to 300 meters³³, some individuals may be able to access an ISF hotspot signal in their own homes, rather than purchasing Internet service from an ISP. This could pose technical problems due to bandwidth and router limitations (routers are designed to receive only so many connections). This bleeding of the network also raises some interesting research questions about how to measure use and other uses and economies that may be served by these sites/nodes.

Although the portal pages designed for WiFiDog were intended to create a local community at the location where the access was provided, many users admit that they occasionally consult the portal page, but they rarely use the profiles to communicate with other people using Wi-Fi in the same space. In our study, the overwhelming majority of individuals we interviewed stated that they do not use the portal page, although 85% of users are aware of the portal page. Some individuals use the list of logged on members to gauge the bandwidth being used and avoid locations with many

logged-on members to avoid slower connection speeds. Powell (2006) also found that users seemed more interested in getting free Wi-Fi than in participating in a wireless community network.³⁴

5.4 What services are most widely used and is the network/service easy to use?

To use the ISF network, individuals must have a laptop or personal digital assistant that has wireless capabilities (Wi-Fi / 802.11 b or g). The most popular Internet applications were web-based email such as Yahoo!, Gmail and Hotmail, search engines such as Google. Although hotspot connectivity is not required, individuals also used tools like Microsoft Office while at ISF locations. The majority of users in our study said that the ISF network was easy to use, although some individuals had difficulty creating an account.

5.5 What role do target groups and users play in the development of the network and its major programs?

Users have very little input in network development. One ISFer, Michael Lenczner explains, “[o]ur partnerships have an effect in promoting certain uses of our network, but they have only partial control on how those specific uses actually come across. Basically, the requirements are agreed upon together, but there is no check in after that.”

5.6 Hotspot owners’ comments on having the ISF network in their location

Most of the sites were very supportive of the ISF network. The more supportive owners have the highest number of users such as the Arts Café, Café Art Java and Atomic Café. As well, the owners of these locations were fairly flexible in allowing clients to use their laptops for long periods of time (especially if the café was not busy). Interestingly, most of the owners we interviewed do not use the ISF network themselves, but they are aware of the portal page. While hotspot owners were aware of the portal page, many did not know how to upload content onto it. Many owners commented that they would like to have this facility, but lacked the technical skills to implement it.

5.7 What does it cost for users to access the network/service?

How are issues like affordability considered in developing pricing models?

Developing effective pricing models has been important to ISF. According to Michael Lenczner, the Community Wireless Network movement only happened when Wi-Fi equipment became affordable at less than \$200. This lower cost fits into a hobbyist's budget. ISF has had to compete with for-profit ISPs who were charging hotspots for money and wanted to undercut them.

³³ A Case Study of ISF 'Free' Hotspot Owners and Users. Presentation by Barbara Crow, Tammy Miller, and Alison Powell. Canadian Communications Association, Saskatoon, May 30, 2007.

³⁴ Powell, A. (2006, January 17). Personal Interviews: *Convenience and Community: Everyday Uses of ISF Service*, Montreal, Canada.

6. Financial and Other Resources

6.1 Overview

The earliest funding for ISF came from the Mobile Digital Commons project and from the International Development Research Centre (IDRC) for modifications to WiFiDog. In May 2004, the MDCN provided equipment in kind for 50 hotspots; this contribution was the equivalent of \$45,000. In February 2006, Terminus 1525 contributed a \$20,000 grant for diffusing music at hotspots. Other deliverables from these grants included modification of WiFiDog and some hardware. In January 2006, CHOQ (alternative FM radio station in Montreal) provided equipment in kind to purchase music hardware for hotspots. In March 2005, Telephone provided equipment in kind, paid for services and contributed free VoIP phones and \$2000 for code modification. The Office National de Film paid \$1000 for services. In exchange for office space for one year, ISF set up a network in Centre St. Pierre. Other partners have included cafes, bars and ongoing hotspot providers. Most ISF funds have been the result of government grants directed towards the development of specific functionalities within WiFiDog. ISF has also received grant funding from Heritage Canada and the Canada Council for the Arts. Grants from cultural ministries are intended to assist in the diffusion of cultural content using new technology. Recent academic research projects and partnerships have also added to ISF's funding base, these include: CRACIN, Partiques Callaboratives, LabCMO and CWIRP (funded by Infrastructure Canada).³⁵

6.2 What influence do funding agencies have in shaping the direction of the organization and/or its services?

What accountability mechanisms are in place?

The only funding agency ISF has received money from directly is the Canada Council for the Arts. As founding member Michael Lenczner states, "They didn't shape the direction of the organization so much as allow us to pursue our goals of promoting more cultural content, developing our practice of aggregating and re-contextualizing, as opposed to generating new content, and working with other Canadian CWNs." ISF did not apply to an existing, established funding channel for this partnership and Île Sans Fil received a contract for work directly from Canadian Council for the Arts.

³⁵ Source for all financial information from: Powell, A. (2006). *Île Sans Fil as a Digital Formation*, LABCMO, École des Médias, Université du Québec à Montréal.

7. Community

7.1 External Stakeholders

What stakeholders influence, or are influenced by, the CWN initiative?

Île Sans Fil has been influenced by the following stakeholders: cafés, business improvement agencies (St. Laurent and the gay village), one borough, other Community Wireless Networks (especially the Canadian CWNs), the local tech scene and other free / grassroots technology projects worldwide. Media visibility has also been important for ISF as it helped the organization increase the number of locations they serve and in soliciting new volunteers. Media visibility directed at raising ISF's profile to businesses and potential users concentrates on the utility of the service, not its cost aspect and the unique community orientation of the project.³⁶

7.2 Impact and Benefits

What impact does the network/service have on the broader community in which it is active?

In our study, most users were interested in the ISF network as it was free. The majority of users felt that using their services did not make them feel more connected to the Montreal community. A few users mentioned that if the hotspot went down or went away for a while they would be disappointed, as many individuals would have to work in their office or at school instead of a hotspot. Many of the users preferred the atmosphere of hotspots instead of working in an office or a library. If an ISF network was not available, users said that they would seek out another free/public Wi-Fi hotspot. While people may support ISF's mandate, generally individuals were looking for a wireless connection, not necessarily for a way to better inform themselves about their community and/or socialize with other people in public spaces.

7.3 Community Profile

Montreal is the second largest city in Canada at seven million. It is located in a culturally rich and bilingual province with the highest number of cultural producers in the country³⁷ with a median age for men at 37.8 and for women 39.8 with 82 per cent of its population over age 15. The majority of individuals are Canadian born and over 450,000 people have immigrated to Quebec since 1991, with average earnings per full work year \$39,217. French is the main language most often used in the paid work place. The predominant employers are manufacturing and construction industries followed by other services and health and education.³⁸

Montreal's cultural richness has played a role in the development of ISF's community Wi-Fi network as well as its long history of engagement with sustainability issues and

national independence. European colonial cultures, especially France, have also contributed to the architecture, design and Catholic heritage that influence the city. In particular, the high number of artists and self-employed individuals has partially sustained a strong public, café culture. ISF implemented its first free hotspot in July 2003 at Café Laika - centrally located in what is considered to be a funky and hip neighbourhood, the Plateau. The Café serves as a beacon site and is one of ISF's most frequented and long standing free hotspots.³⁹

7.4 Policy/regulatory/legal Context

Île Sans Fil has not explored how the organization is impacted by policy and legal issues. However, they do keep up-to-date with other community wireless network blogs and listservs which often relay important policy information and updates pertaining to network strategies and technical developments.

³⁶ Powell, A. (2005). *The Politics of Visibility: Montreal's Île Sans Fil*. Paper presented at the Association of Internet Researchers, Chicago, USA.

³⁷ Findings released by Hill Strategies study, *Resources on the Arts*, found that Montreal has the highest average earnings of artists as a percentage of average local labour force earnings and the second highest population of artists after the city of Toronto, http://www.hillstrategies.com/resources_details.php?resUID=1000160.

³⁸ Data retrieved from Statistics Canada. 2002. 2001 Community Profiles, Released June 27, 2002, <http://www12.statcan.ca/English/Profil01/CP01/Indedx.cfm?Lang=E>, accessed November 6, 2006.

³⁹ A Case Study of ISF 'Free' Hotspot Owners and Users. Presentation by Barbara Crow, Tammy Miller, and Alison Powell. Canadian Communications Association, Saskatoon, May 30, 2007.

8. Critical Success Factors and Lessons Learned

What were the key factors that enable the development of this network/provision of this service?

One of the critical success factors for ISF is the organization's business model. For businesses, Wi-Fi service provided by Bell or Rogers (telephone and cable companies respectively) requires a capital investment by the hotspot owner. This capital cost is then recuperated by charging the end-user and by splitting profits with the Internet service provider. ISF provides a similar service, but the organization only charges \$50 per year as a contribution to the organization and they provide wireless routers at cost. In a way, ISF reproduces corporate business models, but without the corporate cost and with more flexible software. For ISF, once they had a critical number of hotspots, it was easier to tell businesses that they only had to pay \$50 per year including technical support. According to Alison Powell, "ISF's success suggests that a combination of a change in discourse and a slight change in economic model can reframe the economic relationships surrounding Wi-Fi."⁴⁰

8.1 What was the role of local context?

Quebec has a unique culture of community engagement rooted within community groups. Since the 1990's, Quebec community groups have been characterized by an interest in and promotion of information technologies in service of the community. This context of community engagement with technology and the strong café culture in Montreal has definitely influenced the development and positioning of Île Sans Fil. It has been ISF's contention that if they were to take up place and context more specifically through their technology that they could possibly increase citizenship and community involvement generally and more specifically to raise awareness of Wi-Fi.

8.2 What lessons from this case study are applicable for other public (wireless) Internet infrastructure development projects?

Île Sans Fil is a good example of how grassroots innovation can emerge in competition and cooperation with other types of service provision. In developing a similar network, organizations may want to consider their ability to provide open and accessible networks, to leave room for community innovation and to create the conditions of possibility for a new generation of community media and digital citizenship.

⁴⁰ Alison Powell, "Île Sans Fil as a Digital Formation," LABCMO, École des Médias, Université du Québec à Montréal, July 20, 2006

9. Assessment

*How well has this organization/network done in meeting its stated objectives?
Do the stated objectives meet the needs of stakeholders?*

In many respects, ISF is considered to be Canada's most successful community wireless network. In March 2005, ISF received the Montreal Prix d'Innovation Sociale for its contributions to the social use of information technology. ISF has become the dominant provider of wireless access points and an important part of Montreal's community-based media. In May 2005, ISF was voted one of the five best Internet service providers in Montreal by the Mirror independent weekly newspaper.⁴¹

9.1 Does this network/organization provide a public benefit? How?

One of the main benefits that Île Sans Fil provides is the opportunity to use free Wi-Fi in publicly accessible spaces. The mobile professionals, students and freelance workers that typically use ISF's services enjoy being wirelessly connected away from home. The majority of hotspot owners we interviewed agreed that having an ISF hotspot provided them with a competitive advantage. For example the owner at Café Art Java stated that having an ISF hotspot brings in 50 additional clients per week. In this respect, ISF may help the economy by attracting and drawing in regular ISF customers to small businesses. The community aspect of ISF also provides a public benefit by promoting art and cultural content through projects such as Hun d'Artistes Local.

9.2 What are the strengths and weaknesses of this network/organization?

Île Sans Fil has been very influential in their community wireless initiatives in providing technical information, consulting work and applications that have been fairly straightforward to adapt to different sites. ISF's commitment to provide applications such as WiFiDog and HAL has been designed specifically to enable community representation on portal sites. These applications are an attempt to bring meaning to virtual community and link them back to the place where users live and work. However, numerous requests for assistance setting up community Wi-Fi networks, building and maintaining their own network and developing user/community applications have been very demanding for this volunteer based organization.⁴²

9.3 How could this network/organization be improved?

Île Sans Fil could improve their organization by providing more reliable service and better communication with hotspot owners. Several owners in our study mentioned that they were concerned about what to do when the network crashed and the majority of these sites said that it was difficult to contact ISF when their networks went down. While many of the owners tried simple strategies like turning the router/server off and on, many wanted more immediate service from ISF or at the very least some kind of instruction manual on what they could do when the network went down.

Overall, ISF has been a tremendous success in the development and deployment of community Wi-Fi. They have set new standards for user integration through their social software applications and have been generous in transferring their skills and knowledge to other community Wi-Fi groups around the world. However, our preliminary findings suggest a number of items ISF may want to ponder -- who really needs these networks? - how does securing more business from regular customers who spend more time in a place of business enhance profits? -- how do these regular customers who spend more time and take up more space change patterns of use in an establishment? -- why aren't women using these networks? - how will this group of young white freelance workers shape our expectations, design and delivery of other Wi-Fi networks?

Finally, ISF has recently entered an agreement with the City of Montreal that will affect its current organization, structure and delivery.⁴³ In November 2007, the city announced a \$200,000 commitment per year for ISF to add more hotspots to cover most of the city and its 17 parks. In this arrangement, ISF will be able to secure a stable location and provider better quality of service. While ISF members are excited by not having to spend time concerned about funds and maintaining the network, they are struggling with transitioning from a volunteer organization to a funded non-profit one. It will be interesting to follow how ISF negotiates institutionalization and whether they will be able to maintain their 'free' hotspots.

⁴¹ Powell, A., & Regan Shade, L. (2006). Going Wi-Fi in Canada: Municipal, and Community Initiatives. *Government Information Quarterly*. Volume 23, Issues 3-4, 2006, pp. 381-403.

⁴² Engaging Citizens in Community Wi-Fi: Insights From Three Canadian Case Studies. Presentation at the Third International CICT Conference, "Mobile and Wireless Content, Services and Networks," Center for Information and Communication Technologies, Technical University of Denmark, November 30th – December 1st, 2006. Barbara Crow, Graham Longford, Catherine Middleton, Andrew Clement, and Tammy Miller.

⁴³ See <http://montrealtechwatch.com/2007/11/23/wifi-to-be-availaible-in-parks-and-public-spaces/> and <http://www.cyberpresse.ca/article/20071122/CPACTUALITES/71121260/5050/CPRESSE>.

Appendix A

Chart of ISF Hotspot Use in Montreal May 9-12, 2007

ISF Hotspot	Location	Time	Number of Users on Laptops	9-May	10-May	11-May	12-May	Total
Café l'Utopik	552 St. Catherine E	3:24 PM	6	1	1	2	4	8
Juliette & Chocolat	1615 St. Denis	11:30 AM	0	1	1	1	1	4
Auberge Cosy	1274 St. Catherine E	1:20 PM	0	0	0	0	0	0
Le Cabaret a Mado	1115 St. Catherine E	12:42 PM	0	1	1	0	0	2
Mike's Restaurant	902 st. Catherine E	12:28 PM	0	0	0	0	0	0
Autur Dun pain	1219 St. Catherine	12:52 PM	0	0	2	1	1	4
Café Laika	4040 St. Laurent	10:41 AM	6	9	13	12	6	40
Café Art Java	837 Mont Royal	12:42 PM	5	11	12	4	1	28
Arts Café	201 Fairmount	2:29 PM	1	13	7	7	2	29
Café Pi	4127 St-Laurent	4:19 PM	5	2	3	5	5	15
Camillia- Sinensis	351 Emery	6:48 PM	1	0	3	3	1	7
Florist on Amherst	1447 Amherst	1:30 PM	0	0	0	0	0	0
Spin Café -Laundromat	3801 rue Adam	6:10 PM	0	1	1	2	3	7
Atwater Library	1200 Atwater	3:43 PM	0	3	0	2	1	6
Atomic Café	3606 Ontario E	4:51 PM	3	7	4	5	5	21
Salon Mogador	310 Beaubien E	8:50 PM	1	0	0	1	4	5
Marche Jean-Talon	Jean-Talon	11:36 AM	0	3	0	1	1	5
I Technique signal	St. Laurent	1:29 PM	5	2	2	2	0	6
Else's on Roy	156 Roy E	2:34 PM	1	1	8	3	3	15
Salon Alfred Dallaire	4321b St. Laurent	3:11 PM	0	4	2	4	5	15
Santropol Café	3990 St. Urbain	4:23 PM	0	1	2	1	2	6
Café Companie F	6323 St-Hubert	12:40 PM	0	0	0	1	0	1
			34	60	62	57	45	224