

Towards a Broadband Research Agenda for Ontario

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Presentation: Dr. Barbara Crow, York University

I would like to thank Dr. Gale Moore for her invitation to participate in today's event and to the sponsors. As well, much of what I will be presenting today has been shaped by my work with colleagues on two research projects that examine wi-fi, the CWIRP and MDCN -- and I thank them as well.

Introduction:

The delivery, diffusion and dissemination of digital content via wi-fi has been expanding in such a manner that even one of its leading innovators, Sasha Meinrath,¹ cannot reasonably estimate how many there are, where they are and/or how they all operate.

In general, Canada has been slow in the uptake and implementation of wi-fi. A partial explanation for this lag is a long-standing government commitment to fair and accessible landline telecommunications as well as the geographical challenges of the Canadian landscape. It is also not clear that Canadians are convinced that wi-fi technologies offer compelling applications, meaning that there has been limited interest in the rollout of these services, particularly in relation to mobile data and internet access.

To date, there are a number of ways in which municipal governments, community activists, marginal peoples, small businesses and telecommunication companies have taken up wi-fi. Given the ubiquitous and ephemeral character of wireless and digital technologies, part of our challenge is how to reveal them such that citizens and

¹ Sasha Meinrath made this comment at the Alternative Telecommunications Policy Conference, Ottawa, Ontario, October 19, 2006.

consumers can make real choices about how, where, why and when they want to engage and use these technologies.

What is Wi-Fi?:

Wi-Fi is the short form for a technical description of the use of a kind of radio frequency, wireless fidelity. It was developed by the IEEE (the Institute of Electrical and Electronics Engineer). The 802 committee develops standards for local and wide area networks (LANs and WANs). 802.11 is then further divided: 802.11b, or Wi-Fi, is a standard for wireless LANs operating in the 2.4 GHz spectrum with a bandwidth of 11 Mbps. There are other standards as well, but I won't go into them at this point. What is important for you to know is that a standard was set in unlicensed spectrum -- meaning anyone can use this frequency - to transmit in the 2.4 GHz spectrum with a bandwidth of 11 megabits per second.

What happens is a wireless adapter translates data into a radio signal and transmits it using an antenna. This is then sent to a wireless router that receives the signal and decodes it. The adapter and router convert 1s and 0s into radio waves and convert the radio waves back into 1s and 0s. Wi-fi transmits at frequencies of 2.4 GHz or 5GHz. This frequency is considerably higher than the frequencies used for cell phones, walkie-talkies and televisions as a result of this higher frequency it can carry more data.

What kinds of research questions does wi-fi illicit?

Is there a way -- or would it be feasible for the provincial government to provide wi-fi access?

Is wi-fi a way to offer provincial services in a more inexpensive format?

Could wi-fi be a way for the provincial government to own and control a telecommunications infrastructure?

Is it a way to make the provincial government a supplier and access point to internet and mobile services?

In what ways could wi-fi better facilitate provincial/citizen relations?

Is wi-fi a way to provide affordable and easy access to disenfranchised citizens?

How can we bring citizens, consumers and users of these technologies into the research and design process? Let me expand a little here -- many assumptions have been made about citizens around these technologies. In some instances there still continues to be a position that if we build it, they will come. It is clear from a range of research that you need to do more than build -- offer a service -- how can we integrate the user into the research and design process that makes them take ownership, want to use and bring their own meanings and practices to these technologies?

Increasingly, more and more wireless devices are being driven by individualization and personalization -- what are the implications of this increased individualization and

personalization? Is there a way we can intervene to have a more collective orientation or sets of practices?

What are the challenges of privacy, security and surveillance with increased location based awareness technologies such as gps and sensor applications?

What is the capacity for wi-fi? What are its limitations? Spectrum???

Given what we know about some of the possible developments in wireless technologies, for example the current rollout of 3G and 4G -- and wi-fi enabled cell phones, PDAS and other wireless devices, can we provide some possible scenarios or ways to think about how we might take up these possibilities?

At a recent conference I attended, Uwe Hermann suggested that there will be 7 trillion wireless devices serving 7 billion people by 2017. He claimed that "All people will be served with wireless devices; [that they will be] [a]ffordable to purchase and operate; [they will be characterized as] [c]alm communications and computing; [that the] technology [will be] invisible to users; that there will be machine to machine communications; that Sensors and tags in transport and medical systems, infrastructure, will be used to provide ambient intelligence and context sensitivity; and finally, all these devices will be part of a (mobile) Internet

Source: WWRF (World Wireless Research Forum) / Deutsche Bank / EU Commission

Where are we in Ontario about imagining this future -- how can we shape it rather than respond, adapt or reject these possibilities?

Finally, we know that research can be valuable in policy making -- how can we better facilitate relations and research between academics and policy makers around broadband issues?

Conclusion:

Canada is enjoying what Christian Sandvig (2006) refers to as "disorderly" infrastructure. Just as other telecommunications have been introduced over the years, they have gone through various phases of development, implementation, commodification and regulation. Many of these telecommunications have not followed the same path. For example, we continue to have bandwidth for community radio. Are there lessons to be learned from community radio? Are there lessons to be learned by the struggles of community internet networks? Is the shift from federal to municipal level of government a way to leverage public wi-fi networks? Is there a place for provincial governments to take leadership in delivery and implementation of wi-fi? I look forward to exploring these questions and more that may ultimately have the potential to meaningfully engage citizens in the evolving digital technologies shaping our everyday lives.

Terms:

3G -- Third generation - The term refers to digital, packet-switched technology and is used to describe the third-generation of mobile telephony which brings video and broadband Internet access to mobile phones. The first generation was represented by analog cellular phones and the second generation by digital cellular networks.

CWIRP -- Community Wireless Infrastructure Research Project, <http://www.cwirp.org>

MDCN -- Mobile Digital Commons Network, <http://www.mdcn.ca>

Wi-Fi and WiMAX (Worldwide Interoperability for Microwave Access) -- will coexist and become increasingly complementary technologies for their respective applications. Wi-Fi technology was designed and optimized for Local Area Networks (LAN), whereas WiMAX was designed and optimized for Metropolitan Area Networks (MAN). WiMAX typically is not thought of as a replacement for Wi-Fi. Rather, WiMAX complements Wi-Fi by extending its reach and providing a "Wi-Fi like" user experience on a larger geographical scale. In the 2006-2008 timeframe, it is expected that both 802.16 and 802.11 will be available in end user devices from laptops to PDAs, as both will deliver wireless connectivity directly to the end user - at home, in the office and on the move.

