The City Takes to the Air

Notes from a presentation by Robert Ramsay, PhD candidate in Geography and recipient of the Alan Broadbent Graduate Fellowship in Municipal Finance and Governance, 2007-2008

Introduction

Title has two meanings:
- Euphemistic: when the data that constitutes the functions of a municipality is digitized and transmitted, the city takes to the air.
- Disappointment: promised outcomes fade away with realities of implementation, financing, maintenance, etc.

- As of August 2007, 415 municipalities in the US planning or building muniicpal wi-fi networks.
- Much less in Canada, proportionately. Why?
    - Regulatory differences
    - Trend did not catch on in Canada with same frenzy as in the States
    - Many cities, including Toronto, already have robust fibre networks
- Most of this data is from US cases

A great deal of research suggests: mobile data networks indicate exciting potential for mobilization, new possibilities for "the convergence of bodies."
- Jenny Pickerill: on-line environmental activism in UK and Australia
- Jeffery James: connection between cellular networks and entrepreneurship in India
- Howard Rheingold: on-line communities, identity, collectivity
- All optimistic and share view that technology can change and even create social relations
- Muni wi-fi discourse also taps into this utopian imaginary

Three main points of inquiry:
- Why? Why do cities commit to these networks? What problems, what solutions?
- Models. Comes out of community broadband, but current projects often sacrifice access and education for "economic sustainability". What financial constraints shape projects?
- Implications. For particular cities, for the industry, and for urban space.

Number of projects and spending
- Growth of projects over past few years (and projected growth) indicate this is a significant market involving multiple players with different visions.

Why?
- Take a look at four of the primary reasons (given in industry literature and interviews) for initiating muni wi-fi projects. Then a closer look at Philadelphia.

Drivers

1. **Digital Inclusion:**
   - Digital divide still an issue in the US, between 16th and 20th globally on different measures of per capita access
   - For comparison, coverage rate in S. Korea is close to 90%; in US approx. 64%
   - Other countries take broadband access seriously
   - Difference between approaching broadband as "infrastructure" or "service"
   - Access can mean 1) access to hardware; to network, 2) ability to engage in meaningful activity on-line, e.g. streaming, and 3) knowledge, both how and why
   - Digital Inclusion most common topic in literature and interviews

2. **Public Safety**
   - Mobility in the service of public safety and emergency response is highly valued
   - Therefore, public safety replacing digital inclusion as the "funder" of networks
   - Federal funding (e.g. Dept of Homeland Security) a large source of money for these networks
   - Tests on wireless GIS system in Milpitas CA: shaved 120 seconds off emergency response time, a significant change
   - Many cities have chosen to forego public access applications temporarily or altogether in order to secure funding for public safety wireless networks

3. **City Services**
   - Meter reading, parking enforcement, traffic management, building inspection, etc.
   - Using VoIP instead of cell phones for mobile workers, a municipality can save hundreds of thousands of dollars a year
   - Other automatic services (e.g. meter reading) can save hundreds of hours of labour costs or generate revenue (e.g. automatic parking enforcement)

4. **Economic Development**
   - Inward: training of workers for a knowledge economy
     - Problem: declining labour force; declining population
   - Outward: creating a competitive city
     - Attracting businesses; retaining university graduates
   - Strong causal link in discourse between providing access to the technology, including training and education, and the overall financial health of a municipality

Philadelphia

With a population of 1.5 million, Philadelphia is the 5th most populous city in the United States. At 135 square miles, it is actually quite small for its population, ranking somewhere between 50th and 60th in the US for geographical size. It is situated halfway between New York City and Washington DC, and at the convergence of the Schuylkill and Delaware rivers, with ocean access through Delaware Bay. It is therefore a major city for both overland and shipping commerce, as well as a catchment area for the

financial and governmental overflow from its neighbours. Still, the main industries in Philadelphia over the past few decades have shifted away from manufacturing, like many cities in the Rust Belt, and to servicing and sales. It was the capital of the United States before Washington DC, and the site of the drafting of both the Declaration of Independence and the US Constitution, and therefore has a palpable sense of historical importance.

At the same time, the city is plagued by crime, ranking with other troubled cities such as Detroit and Baltimore. Approximately 80% of public school students in Philadelphia receive federal government lunch subsidies, and more to the point here, estimates of Internet access – defined as access at home, work, or school – are as low at 45% in some studies. The deterioration of the inner city has sparked a move outwards toward now-affluent suburbs such as Cherry Hill and Bryn Mawr. This is, of course, a familiar story.

Half of the city's revenue (2006) comes from federal and state grants for transportation, education, HOPE VI, homeland security, etc. Of the rest, wage and earnings tax is significant, and provides a clear incentive for the city to attract business, attract and retain residents, and increase per capita income within the city limits. These are the same stated goals of the city's wireless project.

Wireless Philadelphia
- Grew out of former Mayor John Street's "Neighborhood Transformation Initiative"
- Garnered intense media attention
- Clearly linked economic development to digital inclusion

Pilot areas
- Target areas were either 1) economically depressed or technologically unconnected neighbourhoods of the city, or 2) business or tourist areas
- The successful pilot zone in Olney notably operated with existing community organizations
- Overseen by Wireless Philadelphia and operated by various technology partners
- Currently, the network is operated by EarthLink
- Four years after announcement, the network is 80% complete
- Interview data reveals shared views of Philadelphia's project:
  - Started with important aims and a determination to include the community in the planning process
  - Was a unique and promising model originally
  - Allowed other cities to see community consultation as a good and powerful tool

House Bill 30
- Passed by Pennsylvania legislature and signed into law by Governor Ed Rendell in late 2004
- Essentially an anti-competition edict

- Philadelphia's project was able to be "grandfathered" in due to a last minute deal between Wireless Philadelphia and Verizon
- House Bill 30 heralded a short campaign by telecoms and states to limit the power of cities to construct their own wireless netoworks
  - In 2005, 14 more states attempted; only Nebraska succeeded

Models

Despite this early trouble, telecoms and other technology and service provision companies began turning to cities and the new market in wireless opening up. Philadelphia's original business plan was informed by extensive public consultation, but this plan met resistance at city council. In late 2004, an Atlanta-based consulting firm named Civitium became involved, managing a feasibility study and producing a Request for Proposals that laid out the "cooperative wholesale model". EarthLink responded with a plan of its own that would require little funding from the city while still meeting over time the city's goals. Important point: a case of public access model replaced by public-private partnership model, which set the tone for subsequent projects.

The contract between EarthLink and Philadelphia was highly publicized. All parties to the contract, including Civitium, benefited. However, in Philadelphia progress stagnated:
- Between July 2004 and October 2006, nothing really happened
- Did EarthLink drag its feet in order to secure other contracts before having to "prove" itself capable of doing the job?
- The cooperative wholesale model, as envisioned by Civitium for Philadelphia, did not prove successful elsewhere

In June of 2007, EarthLink hired a new CEO, Rolla Huff, whose first order of business was to cull much of the company's municipal obligations. It quickly pulled out of Houston, San Francisco, and Chicago.

Although EarthLink continues to honour its contract with Philadelphia, the outlook is grim.

Case study database
- Ownership used as a proxy for business model (admittedly problematic), because it highlights a nuance in development of muni wi-fi
- Public ownership: the network, including backhaul, is owned by the city (e.g. St. Cloud FL)
- Private ownership: the network is privately owned (e.g. Mountain View CA)
- P3: a city-provider consortium, with or without a non-profit intermediary (e.g. Philadelphia)
- Other: community networks (e.g. New York) or single use (public safety) networks
- Categories are fluid; for example, P3 can include cases where the city serves as anchor-tenant; should this be considered private?
- Interesting to note that public ownership of the network is still the most common scenario

One Zone

Toronto's network is an interesting contract to Philadelphia's. It is impossible to know
Toronto's project in any significant detail due to the rather inexplicable lack of
cooperation from Toronto Hydro Telecom. Very little pertaining to business plan,
funding structure, relationship to Toronto Hydro and the city, deployment strategy, or
user rates has been made available to the public. Early this year a professor in the
Faculty of Information Science filed a Freedom of Information and Privacy Act request
in order to obtain this information. However, this request has not yet been processed and
I still don't have that information. I will share what I know, which has been pieced
together by and large from media reports, interviews, and financial statements from the
city of Toronto.

- A unique (in North America) amalgamation of a private-ownership and public
  utility model
- Launched in 2006
- Rests on one of the most extensive fibre-optic networks in North America (over
  450 kms of cable, most of it dark)
- Current deployment covers 6 square kms in the financial district in the downtown
  core
- Unlike most American cities, digital inclusion has *never* been a goal of Toronto's
  network; it is a for-profit venture

Performance
As a telecommunications network, One Zone performs well.

Overall
Note: St. Cloud and Mountain View are free networks, which may affect overall ranking.
Also Philadelphia is on both rankings, despite low take-up rates and financial difficulties.
As for One Zone, there is little information on actual take-up rates or subscribers, and
therefore questions about its ability to generate revenue.

Toronto budget
- City relies primarily on property taxes to generate revenue
- Business enterprise earning is where Toronto Hydro Telecom fits in

Business Enterprise Earnings
In the 1% of overall revenue labelled "Business Enterprise Earnings" we find four
primary assets: Toronto Hydro, Toronto Parking Authority, TEDCO (Toronto Economic
Development Corporation), and Enwave (power company). Clearly, Toronto Hydro is
the major contributor to this budget line.

Toronto Hydro
Until more detailed information is available, I can do little more than suggest that the
potential for OneZone to "amplify the revenue" of Toronto Hydro or the City has not yet
been realized. The limited data from 2007 supports this suggestion: for the fiscal year
ending December 31 2007, Toronto Hydro Telecom's revenue was just slighty up to 5.6

million, an increase the financial report attributes to "increased sale of data services" and increased return from "revenue generating assets." One Zone or not? I don't know. On January 22 of this year, Telecom announced its intention to seek expressions of interest from 3rd parties for a possible sale of Telecom, which makes me question the viability of a municipal wireless network as a significant generator of revenue, or revenue as the sole driver of the project. Again, though, the sale could be another mechanism for revenue generation and not related to the success or failure of One Zone.

Impact/Implications
- Due to variability of projects, the impacts will be hard to pin down generally.
- Interviews, though, reveal a shared vision of the "digital city":
  - Ubiquity of access is the most common attribute of an idealized muni wi-fi outcome
  - Sophistication of wired and wireless systems seen as key
  - High capacity for streaming seen as requisite
  - Technical excellence (e.g. low latency)
- Achievement of these goals questionable due to regulatory, financial, and technological realities
- I will suggest that potential impacts for cities are limited to small but measurable financial return through cost savings and in the offering of services

Five year plan sources of revenue
A look at Philadelphia's five year financial plan recognizes that the wireless network will only be a small part of much larger reforms. To wit, the wireless program is projected to generate $800,000/year, just behind gun permit fees!

So, if significant financial gain is not the motivation, then why are 415 cities it the US doing this?
- It's a "technology of hope"
- Enhance the city's appeal
- Making the city more competitive; appealing to the "creative class"
- Intensification of communication network

Drivers (again)

Of the four drivers of projects I outlined at the beginning, digital inclusion, while the most prevalent in the discourse, is proving the hardest to achieve due to financial and regulatory obstacles. It is slowly giving way to public safety as a primary driver, and networks with this focus are able to find ample funding, many through federal grants. Public safety networks, however, are not for public access, and therefore cities that take this route abandon digital inclusion's broader economic development goals. City services are central to many networks and allow for real cost savings for cities, but their scope is limited and are perhaps best seen as value-added for projects with larger aims. Economic development, broadly defined, continues to matter in cities like Philadelphia, where so many residents are unconnected from the Internet and therefore from ways of communicating and learning and doing business that are no longer optional. In cities like

Toronto, however, economic development is a more questionable aim, as the city is already highly connected, and revenue from projects proves difficult to realize.

Tentative conclusion: public ownership, even without public operation, is key in order to realize the possible positive benefits. The operation and management of the network can go to an EarthLink or a Google or a Nortel, and in fact these companies will probably be able to manage a network far more skilfully than a municipality. But the infrastructure must be the city's. The example of St. Cloud, while on a different scale than the larger cities, provides a clear example of a dedicated public effort with measurable benefits. In a relatively short time, the city of St. Cloud was able to build out the network, experience a 470% increase in usage in the first 12 months, and can now boast to have over 77% of households registered. These households paid an average of 36 dollars for Internet access before, and now the annual savings to residents is nearly $4 million. On the other hand, the example of Philadelphia, and even of Toronto, both of which now face the selling off of their municipal networks to the highest bidder, serve as a warning.