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International Issues in Broadband Deployment and Use

Catherine A. Middleton

Ryerson University, catherine.middleton@ryerson.ca

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International issues in broadband deployment and use

Presentation at Chalmers University of
Technology, October 21, 2010

Catherine Middleton

Canada Research Chair

Ryerson University, Toronto Canada

Overview

- Three approaches to building broadband infrastructure
- Getting benefits from broadband connectivity
- Broadband usage (supply/demand disconnect)
- What about wireless?
- Discussion

Why broadband?

- “the foundation of public services and social progress” (Broadband Commission for Digital Development, 2010a)
- “The National Broadband Network will boost productivity and transform the way we live and work—it will improve education and health service delivery and connect cities, regional and rural centres across Australia” (Australian comms minister Conroy)

Broadband Commission for Digital Development (2010a). About the Broadband Commission. <http://www.broadbandcommission.org/about.html>.
Conroy, S. (2010). Address to the National Commercial Radio Conference, 15 October. <http://www.minister.dbcde.gov.au/media/speeches/2010/011>

Underlying assumptions

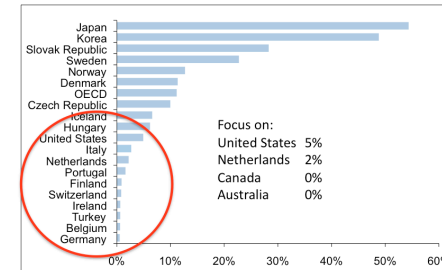
- Broadband network connectivity can be used to provide social and economic benefits to citizens
- Governments believe that broadband connectivity is essential for their citizens

Why fibre?

- “fibre is the next step in the natural technological evolution of the fixed-line telecommunications industry and essential to meeting the ambitious broadband targets set out in the [EU] Digital Agenda” (European Commission, 2010)
- “future-proof”, “end game” etc.

European Commission (2010). Broadband: Commission Sets out Common EU Approach on Ultra-Fast Broadband Networks. <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/10/424&format=HTML&aged=0&language=EN&guiLanguage=nl>.

Fibre to the Premises (FTTP)



Percentage of fibre connections in total broadband subscriptions, Dec 2009
OECD data

OECD (2010). Percentage of Fibre Connections in Total Broadband among Countries Reporting Fibre Subscribers, December 2009. <http://www.oecd.org/dataoecd/21/58/39574845.xls>.

Three Approaches

- *Focus here is on consumer/citizen broadband (not business sector)*
- Private sector: closed
 - e.g. US, Canada
- Private sector: open
 - e.g. Netherlands
- Public sector: open
 - e.g. Australia, Singapore

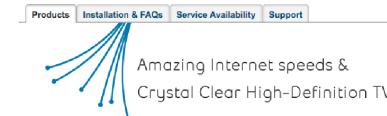
North American (NA) approach

This is FiOS

The TV and Internet of the future. On America's Largest 100% fiber-optic network.

Bell Alliant FibreOP

Canada's first 100% fibre-to-the home network to cover an entire city.



- Incumbent telcos investing in FTTH*
- Driven by competition with cablecos

Verizon: [http://www22.verizon.com/Residential/aboutFiOS/Overview.htm?](http://www22.verizon.com/Residential/aboutFiOS/Overview.htm?CMP=DMC-CVS_ZZ_ZZ_E_TV_N_X001)

CMP=DMC-CVS_ZZ_ZZ_E_TV_N_X001 (or go to verizon.com and click on the FiOS link)

*There are some notable exceptions, e.g. FTTH networks in Lafayette, LA (<http://www.lusfiber.com>) and Chattanooga, TN (<http://epbfi.com/>) owned by municipal utilities. UTOPIA network in Utah, open access. See Cherry, S. (2006). A Broadband Utopia. *IEEE Spectrum* 43(5), 48-54. Alberta SuperNet in Canada (<http://www.thealbertasupernet.com/>).

North American approach

- US regulation does not require telcos to open their fibre services to competitors
 - Verizon investment enabled by this regulatory certainty (?)
- Canadian regulation does require network builders (cable or telco) to allow access to competitors (10% price mark up for “new higher speed wholesale service options”), incumbents have made access very difficult to date

US regulation: Federal Communications Commission (2004). Federal Communications Commission Further Spurs Advanced Fiber Network Deployment. http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-253492A1.pdf.

Canadian regulation: Canadian Radio-television and Telecommunications Commission (2010). Telecom Decision CRTC 2010-632: Wholesale High-Speed Access Services Proceeding. <http://www.crtc.gc.ca/eng/archive/2010/2010-632.htm>.

van Gorp, A., & Middleton, C. (2010). The Impact of Facilities and Service-Based Competition on Internet Services Provision in the Canadian Broadband Market. *Telematics and Informatics*, 27(3), 217-230.

Middleton, C. A., & van Gorp, A. F. (2009). *How Competitive Is the Canadian Residential Broadband Market? A Study of Canadian Internet Service Providers and Their Regulatory Environment*. Paper presented at the Telecommunications Policy Research Conference, Arlington, VA.

Why is the NA approach “closed”?

- Investment in broadband in North America is being driven by television services
 - Cablecos upgrading to DOCSIS3.0, telcos must upgrade to compete
 - “battle for the broadband home”, cutting the other guy’s wire
- Broadband as private sector infrastructure, owned/controlled by telcos/cablecos

Broadband for public benefit?

- In NA it will be difficult to get access to provide public service
- Limited attention to date to broadband as a public utility
- Questions of affordability, quality of service etc. when broadband is delivered by a duopoly
 - Canadian regulator is holding hearings next week about broadband universal service obligation
 - US broadband plan looking at these issues

Canadian Radio-television and Telecommunications Commission (2010). Telecom Notice of Consultation CRTC 2010-43-3: Obligation to Serve and Other Matters (Formerly Proceeding to Review Access to Basic Telecommunication Services and Other Matters). <http://www.crtc.gc.ca/eng/archive/2010/2010-43-3.htm>.

Federal Communications Commission (2010). *Connecting America: The National Broadband Plan*. Washington, DC: FCC. <http://download.broadband.gov/plan/national-broadband-plan.pdf>.

Broadband in the public interest

- Community Wireless Infrastructure Research Project (www.cwirp.org)
- Canadian research project that explored questions of developing broadband infrastructure in ways that benefitted the public, focus on wireless and municipal efforts (2006 – 2008)

See Middleton, C. A. (2008). *Information and Communication Technology (ICT) Infrastructure as Public Infrastructure: Final Report of the Community Wireless Infrastructure Research Project*. Toronto: Ryerson University. http://www.cwirp.ca/files/CWIRP_Final_report.pdf.

Private sector: Open approach



- Dutch incumbent
- Partnership with Reggefibere
- “KPN believes that FttH is the long-term superior technology and will proceed with FttH roll-out in the Netherlands”
- Plans to pass 30% - 60% of Dutch homes

KPN (2009). *Annual Report 2009*. Amsterdam. <http://www.kpn.com/web/file?uuid=69d5ef7b-a2dc-4d9c-97de-04dc57e9688c&owner=baf0ec87-37ad-488a-8aa0-b6043736f25d>

Open access to KPN fibre

- Netherlands is one of the few EU countries with extensive cable TV coverage
- Intense competition between cable (DOCSIS3.0) and telco broadband
- “We need all the friends we can get as we battle against cable carriers. ... They [access seekers] are our competitors, but they’re still our friends.” Jos Huigen, KPN Regulatory Affairs

For discussion of the Dutch market, see van Gorp, A., & Middleton, C. (2010). Fiber to the Home Unbundling and Retail Competition: Developments in the Netherlands. *Communications & Strategies*, 78, 87-106. See also work by Sadowski & colleagues, e.g. Sadowski, B. M., Nucciarelli, A., & de Rooij, M. (2010). Providing Incentives for Private Investment in Municipal Broadband Networks: Evidence from the Netherlands. *Telecommunications Policy*, *In Press, Corrected Proof*.

Jos Huigen quote from IIC conference, Barcelona Spain October 2010.

Open or closed, still private sector

- NA approach has been to fight open access
- KPN is an example of operator that is embracing open access, similar approach advocated by Yankee Group analyst Benoît Felten (@fiberguy)
 - Better to have more competitors on FTTH networks, helps drive uptake, improves business case
- But, open or closed, networks are still controlled by private sector entities

Felten, B., & Swain, W. (2009). *Open Access Makes Economic Sense*. Boston: Yankee Group.

Government as facilitator of bb

- Australia and Singapore as examples, also NZ
 - See 2010 TPRC paper with Jock Given
- BIG broadband
 - Big investment (up to \$43B in AUS ≈283B SEK)
 - Large coverage area (93% FTTP in Australia, 100% in Singapore)
 - Speeds of up to 1 Gbps
 - Public, wholesale open access networks
 - Reconfiguring telecom industry
 - Strategies to develop public/gov't services

Middleton, C. A., & Given, J. (2010). *Open Access Broadband Networks in Australia, Canada, New Zealand and Singapore*. Paper presented at the Telecommunications Policy Research Conference.



Photo on left: Looking toward Midway Point, TAS, showing where the pavement was cut to lay fibre. December 2009
 Photo on right: Near Aurora Energy's Cambridge, TAS Southern Operations base. December 2009
 Realising our Broadband Future conference held in Sydney, December 9-10, 2009.
<http://www.broadbandfuture.gov.au/>

See presentation to ITS conference for more detail: http://www.broadbandresearch.ca/ourresearch/Middleton_ITS_NBN.pdf



Photos taken by Catherine Middleton, IDA Infocomm Experience Centre, Singapore, June 2010. <http://www.ida.gov.sg/News%20and%20Events/20060607171021.aspx?getPagetype=20>

Three Approaches: What about Benefits?

- All three approaches will bring fibre connectivity to citizens' homes
- How do we get benefits from broadband?
 - “it’s about television” – killer app for FTTH?
 - Trans-sectoral services (see work by Paul Budde, <http://www.budde.com.au>)
 - 2009 OECD work on economic justification of FTTH investment

Broadband Commission for Digital Development (2010b). *Broadband: A Platform for Progress*. New York: International Telecommunication Union and UNESCO. <http://www.broadbandcommission.org/report2.pdf>.

OECD Directorate for Science Technology and Industry (2009). *Network Developments in Support of Innovation and User Needs*. Paris: OECD Working Party on Communication Infrastructures and Services Policy. [http://www.oilis.oecd.org/oilis/2009doc.nsf/LinkTo/NT0000889E/\\$FILE/JT03275973.PDF](http://www.oilis.oecd.org/oilis/2009doc.nsf/LinkTo/NT0000889E/$FILE/JT03275973.PDF).

New OECD report on the benefits of broadband anticipated in November 2010.

Benefitting from broadband

- Need better metrics (usage, not adoption)
 - Speed matters (e.g. OECD/ITU def'n 256 kbps)
 - Connection between broadband and the 'information society'
 - Information society indicators
- Need better understanding of how to develop/deliver services
 - Users, devices, networks (fixed/wireless), services

Middleton, C. A. (forthcoming). Beyond Broadband Access: What Do We Need to Measure, and How Do We Measure It? In P. Napoli (Ed.), *Beyond Broadband Access (Working Title)*. Bronx, NY: Fordham University Press.

Middleton, C. A. (2010). Delivering Services over Next Generation Broadband Networks: Exploring Devices, Applications and Networks. *Telecommunications Journal of Australia*, 60(4).

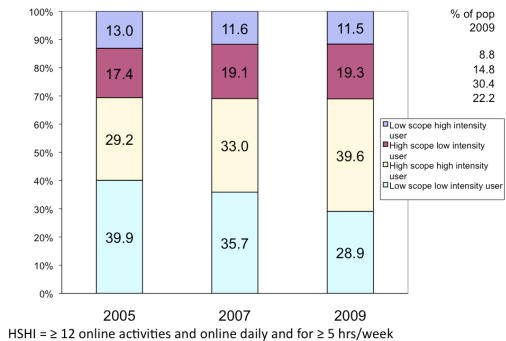
What about the users?

- Statistics Canada – Canadian Internet Use Survey (2005, 2007, 2009)
- Data suggest that although internet adoption rates are high (~80%), actual usage may not be very intensive
- e.g. just 42% of Canadians go online from home for more than 5 hours per week (2009 data)
- Disconnect between information society rhetoric and reality of daily use

Middleton, C., Veenhof, B., & Leith, J. (2010). *Intensity of Internet Use in Canada: Understanding Different Types of Users*. Ottawa: Statistics Canada – Business Special Surveys and Technology Statistics Division Working Papers. <http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=88F0006XIE2010002&lang=eng#formatdisp>.

See my talk in the Big Thinking series about the challenges of creating a digital society: http://www.ryerson.ca/~cmiddlet/files/Middleton_BigThinking.pdf

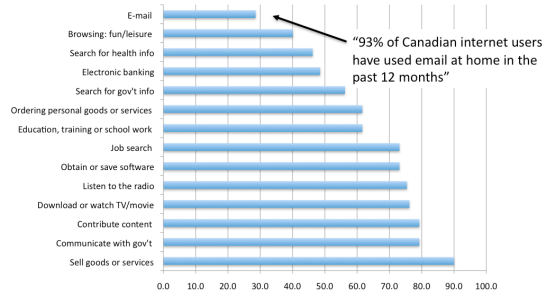
Canadian Internet Use Survey



Custom calculations by Ben Veenhof at Statistics Canada, June 2010. Follow up analysis for Middleton, C., Veenhof, B., & Leith, J. (2010). *Intensity of Internet Use in Canada: Understanding Different Types of Users*. Ottawa: Statistics Canada – Business Special Surveys and Technology Statistics Division Working Papers. <http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=88F0006XIE2010002&lang=eng#formatdisp>. 2009 % of population = CIUS data * .8 (% Canadians who used the internet in the past 12 months) * .96 (% who used the Internet from home)

Digging Deeper

% of adult Canadians who DO NOT do these activities online (from home)



Statistics Canada (2010). Canadian Internet Use Survey, 2009. <http://www.statcan.gc.ca/daily-quotidien/100510/dq100510a-eng.htm>.
Calculations by Catherine Middleton, showing % of total adult Canadian population that did not engage in these specific activities on the internet from home in the past twelve months

What about wireless?

- Argument that wireless networks will never provide the capacity that FTTP/H can offer
- But:
 - Increasing demand for mobile services, FTTH isn't useful away from your home
 - Some (many?) broadband services don't need FTTH, e.g. examples of healthcare, educational services delivered in communities (so fibre to the community is important)
 - Wireless as a disruptive technology (Christensen), if so it doesn't have to be better than fibre

Middleton, C., & Given, J. (2010). *The Next Broadband Challenge: Mobile*. Paper presented at the The Broadband Act of 2011: Developing a Communications Act for the 21st Century: Experts Workshop.

Summary

- 3 models for extending broadband connectivity to citizens, all work, but not all allow for easy service provision outside the private sector
- Benefits of broadband are assumed, asserted, not very clear how they will be realized
- Current broadband usage (in Canada) does not present strong case for next gen networks
- Are we building the right infrastructure? FTTH vs. wireless

Thank you

Contact info:

- catherine.middleton@ryerson.ca
- www.broadbandresearch.ca (will be updated soon)
- @catmiddleton (Twitter)
- Bookmarks at www.delicious.com/canadabroadband