Open Access Broadband Networks in Alberta, Singapore, Australia and New Zealand

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The project

- policy discussion about 'open access' next generation networks is no longer theoretical, because some are now operating or being constructed.
- four different models at different stages of deployment - Canadian province of Alberta, Singapore, Australia, New Zealand
- 'Developing Next Generation Broadband Infrastructure: learning from Australia's national broadband network', funded in 2009/10 by Canadian Social Sciences and Humanities Research Council
- interviews in 2009 and 2010

overview

- Alberta – the SuperNet
- Singapore – Next Generation National Broadband Network [NGNBN]
- Australia – National Broadband Network [NBN]
- New Zealand – Ultra Fast Broadband Initiative [UFB]

Comparative analysis

- Rationales
- What is being done
- Institutional structures
- Services and pricing
- Role of incumbent organizations and infrastructure
- Plans outside the fibre footprint
- Funding and financial expectations
- Local debates about models chosen and performance to date

conclusions

- Only Alberta SuperNet operating for any length of time – different outcomes for
  - government service provision
  - last mile infrastructure
- Singapore
  - integration of incumbents
- Australia and New Zealand
  - early days
  - changes between plans and implementation

Table: Next Generation Broadband Plans – Alberta (Canada), Singapore, Australia, New Zealand

Element	Alberta (Canada)	Singapore	Australia	New Zealand
Population and density				
Population estimate at 5 September 2010	3.8 million	5.1 million [June 2010]	22.4 million	4.4 million
Area [sq km] [US 9.4 mill, Canada 10.0 mill]	662,000	710.3 [2009]	7.7 million	269,000
Persons/sq km [US 32.8, Canada 3.4, 2008]	5.7 [2010]	7,022 [2009]	2.9 [2008]	15.9 [2008]
% of landmass used by cumulative 50% of popn [US 13.91, Canada 15.91]	n/a	n/a	10.36	8.31
General description	Large province of a huge country. Around two-thirds of population lives in two major cities, Calgary and Edmonton. <20% of the population lives in multi-unit dwellings.	Island city state. Densely populated, 85% in multi-unit dwellings.	Island continent with small number of offshore islands. Sparsely populated overall but high % in cities dominated by free-standing houses. Approx 30% live in multi-unit dwellings	Two main islands with small number of others. In 2006, 55% of households were in the Auckland, Wellington and Canterbury [Christchurch] regions.
Broadband penetration				
Number of subs [Dec 2009]	1,091,000 (*estimate, ~11% of Canadian total*)		5,133,000	992,000
Fixed broadband subs/100 inhabs, Dec 2009 [OECD]	29.6 subs per 100 popn [Dec 2009] 11/30 OECD (*Canada*)	23.7 subs per 100 popn [2009 ITU data, non-OECD country]	23.3 subs per 100 popn [Dec 2009] 17/30 OECD	23.2 subs per 100 popn [Dec 2009] 18/30 OECD
Mobile broadband subs per 100 population, 2009 (ITU)	7.7 (*Canada*)	89	67	64.2

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Broadband plans				
Project	Alberta SuperNet	Next Generation National Broadband Network	National Broadband Network	Ultra-Fast Broadband Initiative
Status	Announced 2001. Network built 2005.	Announced 2006. Under construction. First retail customers to be connected late 2010.	Announced 2009. Under construction. [backhaul; Tasmania; other trial sites; further sites] First retail customers connected in Tasmania July 2010. August election returned minority government dependent on support of independents and Green – construction timetable being revised to give priority to regional and rural areas	Election policy 2008. Draft Plan March 2009. Overview and Invitation to Participate, Sept/Oct 2009. Proposals received from 18 different parties and consortia, Jan 2010. Amendments to Plan, July 2010. 14 parties shortlisted for further negotiation of which 3 for 'prioritized negotiations', Sept 2010.
Timeframe for completion	Complete Final Mile Broadband Initiative launched 2010 to extend rural broadband coverage	95% coverage by 2012	8 years - 2018	6-10 years – December 2015 to December 2019
Cost [exchange rates at 5 September 2010]				
Total cost	At least C$330 million including $100 million by Bell Canada for base area network and $30 million by Axia for extended area network	Up to S$1 billion invested by government, private sector investment unknown	A$43 billion	At least NZ$3 billion
Public cost, local currency, $US	C$200 million US$190 million	S$1 billion US$742 million	A$43 billion US$39 billion	NZ$1.5 billion US$1 billion
Public cost per head, $US	$51	$146	$1743	$244

Element	Alberta (Canada)	Singapore	Australia	New Zealand
What has been or will be done				
Overview	• Fibre backbone to points of presence in 429 communities • Fibre connections to 4700 government service providers in these communities and urban centres (provincial government & municipal offices, schools & colleges, health facilities, libraries). • 'Last mile' connections to citizens provided by the private sector. ~300 communities have at least one ISP in 2010. • Government of Alberta is an anchor tenant across the whole network – 10 year contract with Axia for carriage of services and information over SuperNet.	FTTP network to provide broadband connectivity to all homes and offices in Singapore, supporting speeds of 1000 Mbits/sec. Plans to develop and deliver services (e.g. ehealth, elearning, ecommerce, entertainment) over network.	• FTTP, 100 Mbits/sec, 93% of homes, schools, workplaces – generally towns with populations bigger than 1000. NBN Co proposes to focus on Layer 2 services • Terrestrial wireless, 4% of homes and businesses, peak speed 12 Mbits/sec – separate contract will be let • Satellite, peak speed 12 Mbits/sec, remaining 3%	• FTTP to 75% of New Zealanders • Local fibre companies (LFCs) must provide Layer 2 services across all parts of network plus Layer 1 point-to-point services (particularly suitable for business customers) to end-users seeking premium quality services (likely up to 1 Gbps) • Until Dec 2019, LFCs reqd to supply services on non-discriminatory basis. After Dec 2019, LFCs required to provide unbundled access to Layer 1 point-to-point services on 'equivalence of inputs' basis • Remaining 25% addressed in 'separate process which may be associated with the review of Telecommunications Service Obligations'

Element	**Alberta (Canada)**	**Singapore**	**Australia**	**New Zealand**
Priorities	*Initially* Improving rural broadband access Making government services and information available online *Now* Improving rural broadband access by increasing the number of communities with 'last mile' connections to the SuperNet Increasing use of the SuperNet	Network available to 60% of homes and offices by end of 2010. Next Gen Services Innovation Programme to develop new broadband services and applications (initial apps available by end of 2010)	• Tasmania [island province], in conjunction with state government and power utility • Fibre backhaul between major non-metro centres [A$250 million] • Initially - otherwise roll-out simultaneously in metro, regional and rural areas. Post-election, 'outside-in' timetable giving greater priority to regional and rural areas.	• Businesses, schools and health services; greenfields developments and some tranches of residential users within 6 years • 75% of population within 10 years
Structure	• Base area [urban] network funded, owned and operated by Bell [private]. • 'Extended area' network in 402 rural communities [owned by GoA] and operated by Axia [private]. Axia sells Layer 2 or 3 wholesale services to private sector service providers. • Axia does not offer retail services but acts as the GoA's 'service provider', delivering its services and information to the government service providers.	PPP 3-level pyramid: NetCo: OpenNet (Shareholders Axia [private], SingTel [state-controlled]), Singapore Press Holdings, and Singapore Power Telecommunications). OpenNet owns the fibre. OpCo: Nucleus Connect (shareholder: StarHub) activates the fibre. Retail Service Providers (e.g. M1, SingTel, StarHub, SuperInternet) buy access from Nucleus Connect at prices approved by the Infocomm Development Authority.	• Government establishes new state-owned corporation, holds majority of shares, private investors hold rest – Implementation Study later recommends government hold all shares during construction • Corporation builds and operates wholesale FTTP network • Corporation has no retail operations	• Government establishes Crown-owned investment company, Crown Fibre Holdings [CFH] • CFH invests alongside private investors in local fibre companies offering wholesale dark fibre to service providers • Local fibre companies have no retail operations, though non-controlling shareholders may

Element	Alberta (Canada)	Singapore	Australia	New Zealand
Finance	• Base area [urban] network funded [$100 million], owned and operated by Bell. • Extended area [rural] network funded by Government of Alberta [$200 million] and Axia [$30 million].	Government grant of up to S$750 million to OpenNet to build passive fibre network, and up to S$250 million to Nucleus Connect to build and operate active infrastructure.	• 50/50 debt/equity, government holds 51% of equity (approx $11 billion) • government equity from existing A$4.7 billion allocation plus $6.3 billion Infrastructure Bonds issued to households and institutions • 'Significant private investment is anticipated'. Later Implementation Study says likely rate of return insufficient for private investors	• CFH wholly owned by national government. Local fibre companies owned up to 50% by CFH, rest by private shareholders and /or local government • CFH may accept lower rate of return than other shareholders on equity in local fibre companies, but cannot guarantee any rate of return
Future	Long term contracts in place between government and Axia. Efforts are ongoing to increase private sector use of the SuperNet, especially to provide broadband to rural/remote users.	Competition expected at the active layer, Nucleus Connect will not be the only OpCo.	• Government sells down shareholding in NBN Co within 5 years after network built and operational, 'consistent with market conditions and national and identity security considerations' • Post-election – construction schedule being revised to give greater priority to regional and rural areas.	All CFH funds need not be committed at the outset. Can consider staged proposals and reserve funds for future rounds.