

Appendix A – Background

Current broadband services in Australia

1. The term 'broadband' can be loosely defined as a service that delivers data transfer speeds faster than those achievable using the 'narrowband' dial-up internet services that were ubiquitous in the 1990s. The actual speed of a broadband service may therefore vary greatly. The Australian Bureau of Statistics (ABS) defines broadband as 'an "always on" internet connection with an access speed equal to or greater than 256 kbit/s'.¹ This compares to 56 kbit/s for most dial-up connections. 'Always on' means that the service can remain constantly connected to the internet without disrupting voice telephone services.
2. The OECD also defines broadband as internet connectivity capable of download speeds of at least 256 kbit/s,² while the US Federal Communications Commission recently updated its definition of broadband to refer to speeds of at least 4 Mbit/s download and 1 Mbit/s upload speeds.³

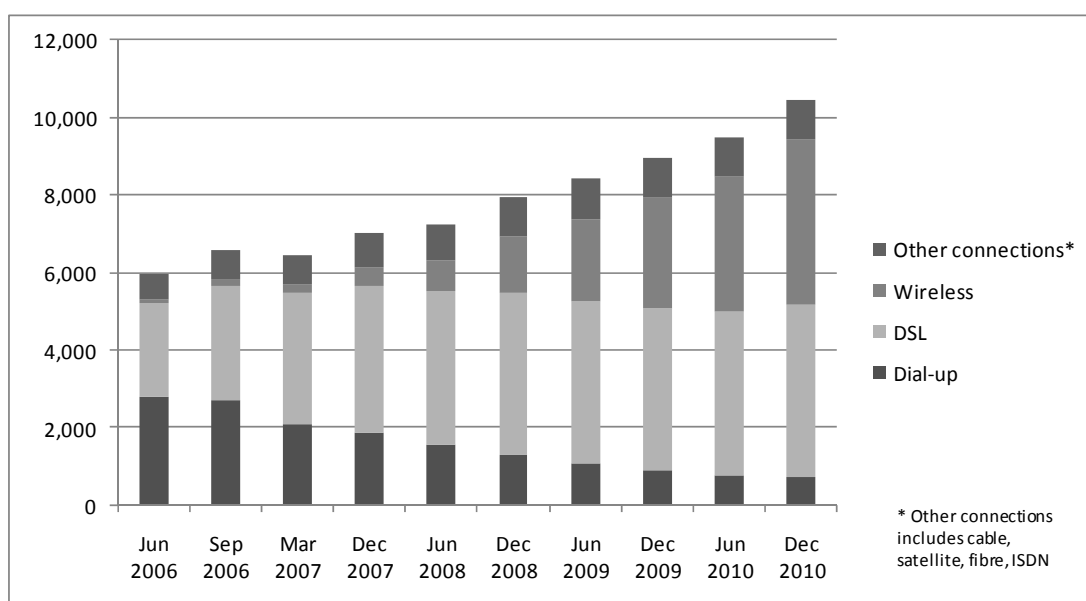
1 Australian Bureau of Statistics (ABS), 'Information and Communication Technology (ICT) and Innovation Statistics Glossary' <<http://www.abs.gov.au/websitedbs/c311215.nsf/20564c23f3183fdaca25672100813ef1/c49fb25ed58f2ec4ca25702f001eeaaa!OpenDocument>> viewed 28 January 2011.

2 OECD Broadband Subscriber Criteria, 2010 <http://www.oecd.org/document/46/0,3746,en_2649_34225_39575598_1_1_1_1,00.html> viewed 28 January 2011.

3 FCC, *Sixth Broadband Deployment Report*, 16 July 2010 <http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-129A1_Rcd.pdf> viewed 28 January 2011.

3. Advertised speeds for all types of broadband services are usually an indication of *peak* speed, which is the theoretical maximum speed allowed by the technology. However, the actual speed of data transfer experienced by users will vary greatly depending on a number of other factors, including their distance from the nearest exchange or transmission tower (particularly for DSL and wireless broadband), the number of other users on the network at the particular time (particularly for wireless, satellite and cable), and physical barriers and weather conditions (particularly for wireless and satellite). The average speed that is experienced by users is usually significantly lower than the peak speed.⁴
4. According to the ABS, 43 per cent of Australian internet access connections in December 2010 were DSL broadband, closely followed by mobile wireless broadband at around 40 per cent. Dial-up internet connections now make up less than 7 per cent of connections, a decrease from 47 per cent in June 2006. The remainder of connections are made up of cable, satellite, fixed wireless and a small number of fibre connections and other technologies, as shown in the below figure.⁵

Figure A.1 Number of internet subscribers by connection type, all ISPs, 2006-2010



Source Australian Bureau of Statistics, 8153.0 – Internet Activity, Australia, Dec 2010

4 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 275.

5 ABS, 'Table 1 Internet subscribers by type of access connection, for ISPs with more than 1,000 active subscribers', 8153.0 – Internet Activity Australia, December 2010. <<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8153.0Main+Features1Dec%202010?OpenDocument>> viewed 18 July 2011.

DSL broadband

5. Currently, most fixed line broadband services in Australia are Digital Subscriber Line (DSL) connections. DSL uses existing copper-based telephone networks to digitally transfer data.⁶ Asymmetric DSL (ADSL) is the most common type, and simply indicates that data is uploaded at a lower rate to that at which it is downloaded. ADSL 2 and 2+ are common variations of this technology which enable faster download speeds than more basic ADSL 1 standard, provided premises are close enough to a telephone exchange. Other variations include VDSL (Very High Bitrate DSL), which can provide even faster transfer speeds close to an exchange.⁷
6. Unlike dial-up internet, DSL data is transferred at different frequencies to voice data, enabling users to be connected to the internet at all times without affecting their telephone services.⁸
7. The use of existing copper networks makes DSL services theoretically available to all premises with a telephone line; however, there are several limitations which mean ubiquitous DSL broadband is not currently possible. Firstly, local telephone exchanges must have equipment known as DSL Access Multiplexers (DSLAMs) installed by an internet service provider (ISP) before DSL services can be offered.⁹ While ADSL 2+ is now available at most metropolitan and larger regional exchanges, the limited commercial appeal of more remote exchanges mean that it is still not available in many areas. According to the NBN Implementation Study, DSL broadband of some type is available to approximately 92 per cent of the population.¹⁰
8. Secondly, a lack of competitive fibre 'backhaul' networks in many parts of Australia means that high quality and affordable DSL services are not possible without significant new investment in infrastructure, which the private sector has been reluctant to undertake given limited potential for return.¹¹ The government's Regional Backbone Blackspot Program (RBBP) is going some way to addressing this problem (see further details below).

6 Alcatel-Lucent, *The National Broadband Network: a glossary of terms*, 2010.

7 Ayre et al, 'A Guide to Broadband Technologies', *The Australian Economic Review*, vol. 43, no. 2, June 2010, p. 201.

8 Ayre et al, 'A Guide to Broadband Technologies', *The Australian Economic Review*, vol. 43, no. 2, June 2010, p. 201.

9 Ayre et al, 'A Guide to Broadband Technologies', *The Australian Economic Review*, vol. 43, no. 2, June 2010, p. 201.

10 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 12.

11 See Regional Telecommunications Independent Review Committee (RTIRC), *Framework for the Future*, September 2008, pp. 217-221.

9. Thirdly, and most importantly, the speeds of DSL connections vary significantly depending on the distance of the premises from the local telephone exchange. This is due to loss of signal along the copper lines. Premises very close to an ADSL 2+ enabled exchange may obtain download speeds of over 20 Mbit/s, while those several kilometres from an exchange may only receive 1 to 2 Mbit/s, or not be able to receive DSL broadband at all.¹² The deteriorated condition of copper lines also reduces the quality of DSL services in many areas.¹³

Wireless broadband

10. Wireless broadband has been rapidly increasing in popularity in recent years. It uses a range of technologies to transmit data to users' devices without the need for a telephone line or other fixed line service to their premises.
11. There are two main types of wireless broadband technologies: fixed wireless and mobile wireless. Fixed wireless refers to services that are designed to be transmitted to premises equipped with a fixed antenna (often externally). Mobile broadband services transmit to small portable devices such as 'smart phones' and laptops.¹⁴
12. While fixed wireless does not currently exist on a large scale in Australia,¹⁵ mobile broadband has become increasingly popular in recent years. The numbers of subscribers to mobile broadband services have increased from less than 500 000 in December 2007 to over 4.2 million in December 2010, and as a proportion of total broadband subscriptions, mobile broadband has increased from 7 per cent to around 41 per cent over this period.¹⁶
13. The NBN Implementation Study puts the current growth in mobile broadband subscriptions down to a number of temporary factors, including recent price drops, rapid take-up in the business sector and poor fixed line broadband services.¹⁷ The ongoing substitution of standard mobile phones with smart phones and other devices has clearly also

12 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 60.

13 For example, see Mr Steven Harrison, Director, Business and Economic Development, City of Prospect, *Committee Hansard*, Adelaide, 4 April 2011, p. 65.

14 Alcatel-Lucent, *The National Broadband Network: a glossary of terms*, 2010.

15 ABS data indicates there were around 33 000 subscribers to fixed wireless broadband services in Australia in June 2010. See ABS, 'Table 2 Internet subscribers by type of access connection, for all ISPs', *8153.0 - Internet Activity Australia*, December 2010.

16 ABS, 'Table 1 Internet subscribers by type of access connection, for ISPs with more than 1,000 active subscribers', *8153.0 - Internet Activity Australia*, December 2010.

17 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, pp. 232-234.

increased the number of connections. The Implementation Study notes that the vast majority of mobile broadband customers also have a fixed line broadband service.¹⁸ ABS data shows that fixed line services still account for over 91 per cent of all data downloaded in Australia, compared to less than 9 per cent for wireless.¹⁹

14. With denser tower distribution and more effective receiving antennas, fixed wireless is capable of providing faster speeds and more consistent performance than mobile wireless broadband, particularly if external antennas are attached to premises.²⁰ However, both types of wireless technology are affected by geography, with performance dropping with distance from a tower and due to physical barriers such as hills and trees. Users of wireless broadband must also share capacity, meaning the more people that are using their connection the lower the performance (this is known as 'contention'). For these reasons, fixed wireless broadband is considered a suitable alternative to fixed line services in areas with lower population densities where it is not economical to provide fixed line broadband infrastructure.²¹
15. These ISP-delivered wireless broadband services should not be confused with short-range wireless technologies such as Wi-Fi. Wireless Local Area Networks in homes, workplaces and publicly accessible wireless 'hot spots', such as in cafes and libraries, almost always use a wireless router that is attached to a fixed line broadband connection.

Other broadband technologies

16. Hybrid Fibre Coaxial (HFC) cable broadband, often known simply as 'cable', is available to many consumers in larger cities, primarily using Telstra and Optus networks.²² This service uses the same infrastructure as that which delivers cable subscription television services, and can deliver very fast broadband speeds with only negligible loss of signal. It uses fibre optic cables to transfer data to nodes close to premises, then coaxial cable for the 'last mile' of transfer from the node to premises.²³

18 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 233.

19 ABS, 'Volume of data downloaded by access connection, for ISPs with more than 1,000 active subscribers', 8153.0 - *Internet Activity Australia*, December 2010.

20 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, pp. 12, 274-276.

21 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 280.

22 Availability is estimated at 20 per cent of the population; see McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, pp. 21, 135.

23 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 21.

17. HFC is essentially a proprietary form of fibre-to-the-Node (FTTN), which is the generic name for infrastructure where fibre is laid out to equipment 'nodes' in each neighbourhood rather than all the way to individual premises. HFC is more widely deployed in Europe and North America than in Australia.²⁴ The NBN Implementation Study notes that while HFC is capable of providing fast broadband connections, compared to alternative technologies there are questions about its ability to provide a wholesale open-access network, keep pace with future bandwidth requirements and, due to its higher contention ratios, deliver reliable average speeds and enterprise-grade services to customers.²⁵
18. Satellite broadband currently has around 111 000 subscribers in Australia,²⁶ mainly provided through IPSTAR and Optus. Current satellite services are slow compared with other technologies, and performance suffers from high 'latency', a delay in response time caused by the distances that signals need to travel to reach and return from satellites orbiting around 36 000 kilometres above the earth.²⁷ However, satellite broadband is often the only viable broadband option for many people in remote areas. Current satellite broadband services are provided by geostationary (GEO) satellites operating over the Ku band. Under the Government's Australian Broadband Guarantee program, which ended in June 2011, residential and small business premises in locations unable to access 'metro-equivalent' broadband services were able to access satellite broadband services at a subsidised price.²⁸
19. Fibre-optic cable, or just 'fibre' for short, is made of thin threads of glass that carry data in the form of pulses of light. As fibre is less susceptible to 'noise' and 'interference' than other technologies, it is able to transfer large amounts of data over long distances without loss of quality or speed.²⁹ A single fibre is capable of extremely high bandwidth transmission, with recent studies demonstrating speeds of over 100 *terabits* per second

24 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 135.

25 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, pp. 105–108, provides a discussion of the issues around HFC and its potential use as an 'interim' solution in some areas.

26 ABS, 'Table 1 Internet subscribers by type of access connection, for ISPs with more than 1,000 active subscribers', 8153.0 – *Internet Activity Australia*, December 2010.

27 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 277.

28 For details refer to *Australian Government*, 'Australian Broadband Guarantee: Program Guidelines 2010-11', July 2010

<http://www.dbcde.gov.au/__data/assets/pdf_file/0017/128204/Australian-Broadband-Guarantee-2010-11-Guidelines-July-2010.pdf> viewed 18 July 2011.

29 Alcatel-Lucent, *The National Broadband Network: a glossary of terms*, 2010, p. 5.

(100 000 000 Mbit/s).³⁰ The actual speed of transmission depends on the equipment that is installed in exchanges, aggregation points and end user premises.³¹

20. Fibre is already used extensively in backhaul telecommunications networks, including international submarine cables. Fibre is also increasingly being used for network connections closer to individual premises. Fibre-to-the-premises (FTTP) refers to fibre delivered all the way to an individual home or business (the 'last mile'), eliminating any dependence on copper cabling. FTTP has been increasingly made available in new developments, and many large businesses and public institutions, including schools, universities and hospitals, also already have fibre connections,³² although these connections are often under-utilised due to cost barriers.³³

Overview of the NBN

21. The National Broadband Network (NBN), as announced by the Federal Government on 7 April 2009, promised to deliver a 'super fast' FTTP network delivering broadband services of up to 100 Mbit/s to 90 per cent of Australian premises, with the remaining 10 per cent to be serviced by wireless broadband with speeds of at least 12 Mbit/s.³⁴
22. Shortly after the announcement, NBN Co was established as a wholly government-owned company to build and operate the NBN. Mr Mike Quigley was appointed as NBN Co's Chief Executive Officer on 25 July 2009.³⁵

30 New Scientist, 'Ultrafast fibre optics set new speed record', 29 April 2011 <<http://www.newscientist.com/article/mg21028095.500-ultrafast-fibre-optics-set-new-speed-record.html>> viewed 18 July 2011.

31 See Ayre et al, 'A Guide to Broadband Technologies', *The Australian Economic Review*, vol. 43, no. 2, June 2010, pp. 203-204.

32 Paul Budde Communication Pty Ltd, *Australia - National Broadband Network - Critical Considerations*, 29 April 2009, p. 3.

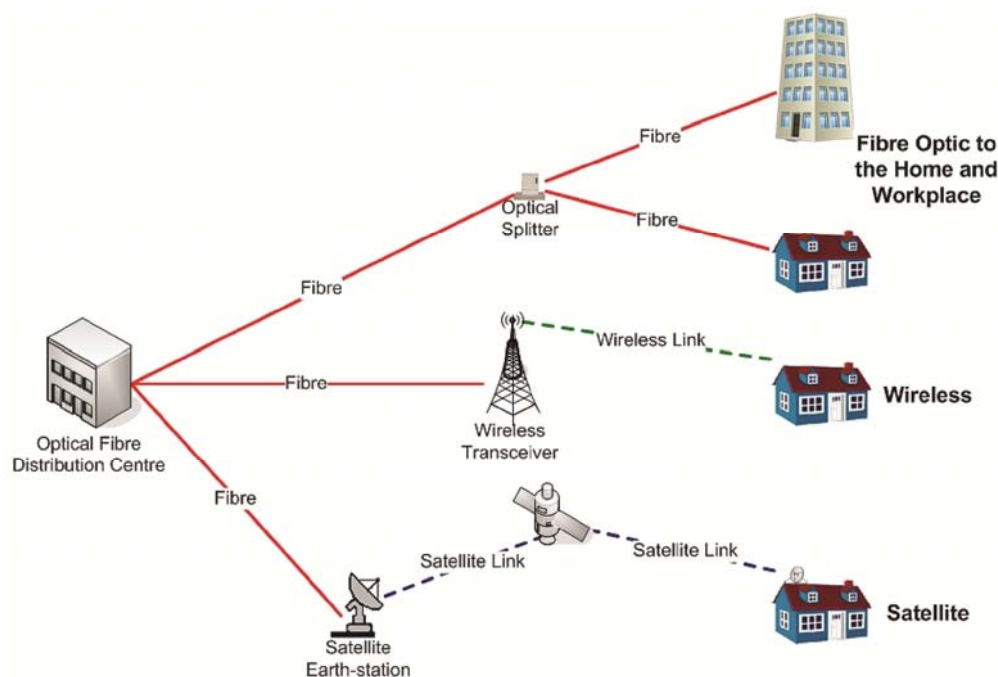
33 The Department of Education, Employment and Workplace Relations (DEEWR) estimates that 63.4 per cent of schools and 80 per cent of TAFEs have fibre connections, but download speeds often remain slow due to pricing and contract issues. See Australian ICT in Education Committee (AICTEC), *Submission 124*, pp. 10-11.

34 Prime Minister, Treasurer, Minister for Finance and Minister for Broadband, 'New National Broadband Network', *Joint Media Release*, 7 April 2009.

35 NBN Co, 'History' <<http://www.nbnco.com.au/wps/wcm/connect/main/site-base/resources/about-nbn-co/history-of-nbnco/>> viewed 18 July 2011.

23. In August 2009, McKinsey-KPMG was appointed by the Government as the Lead Advisor for the NBN's Implementation Study.³⁶ The Government released the Implementation Study in May 2010.³⁷ Among other things, the study recommended the FTTP component of the NBN plan should be extended to 93 per cent of households. Fixed wireless technology would deliver broadband to another 4 per cent of households, and next generation satellite technology would service the remaining 3 per cent of the population. Figure A.2 below gives an overview of the type of infrastructure to be used, and Figure A.3 shows NBN Co's indicative coverage map of each type of technology. The government's official response to the Implementation Study, accepting its key recommendations, was publically released on 20 December 2010.³⁸

Figure A.2 NBN technologies

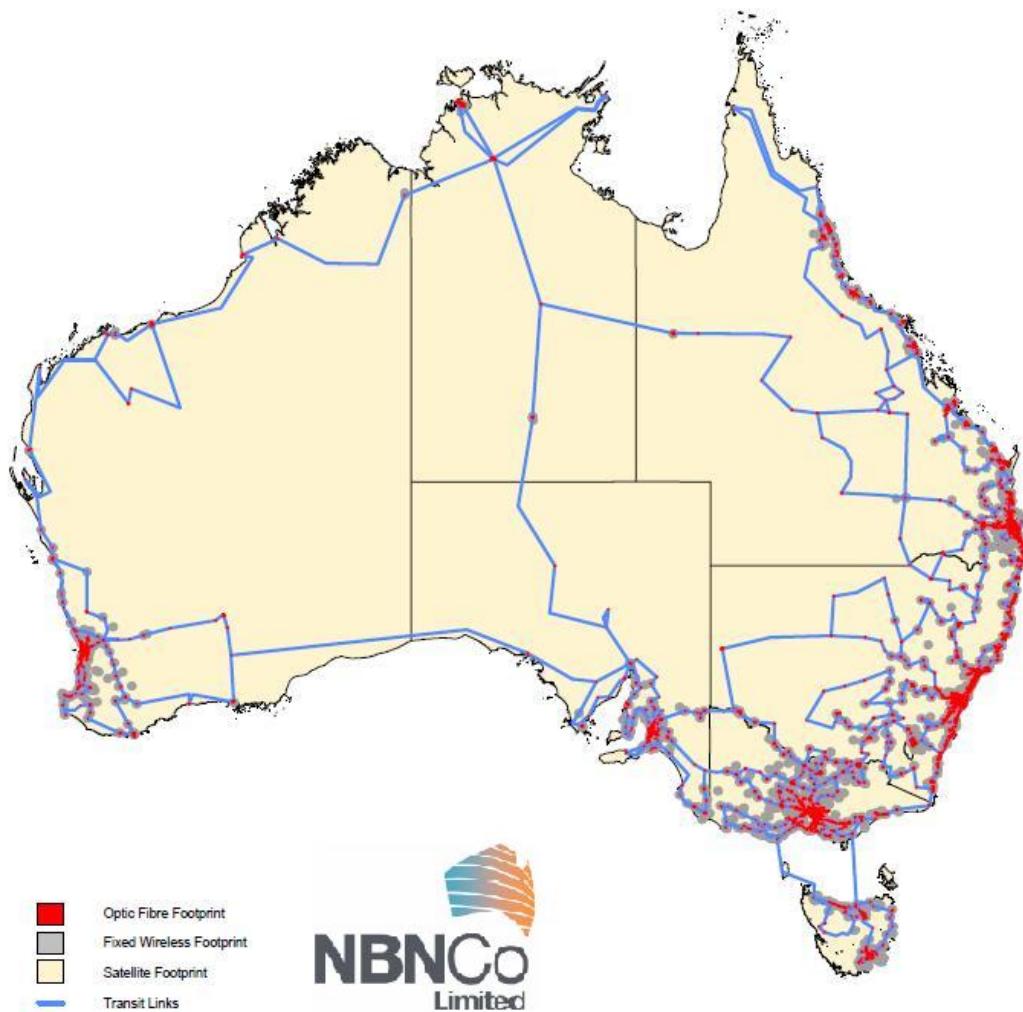


Source Australian Government, '21st Century broadband'

<http://www.dbcde.gov.au/_data/assets/pdf_file/0005/110012/National_Broadband_Network_policy_brochure.pdf> viewed 14 January 2011.

- 36 Senator the Hon Stephen Conroy, 'McKinsey-KPMG appointed Lead Advisor for National Broadband Network', *Media Release*, 6 August 2009.
- 37 See DBCDE, 'National Broadband Network Implementation Study' <http://www.dbcde.gov.au/funding_and_programs/national_broadband_network/national_broadband_network_implementation_study> viewed 18 July 2011.
- 38 Senator the Hon Penny Wong, Minister for Finance and Deregulation and Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, 'Statement of Expectations', *Joint Ministerial Direction*, 17 December 2010.

Figure A.3 Indicative coverage of NBN fibre, wireless and satellite services



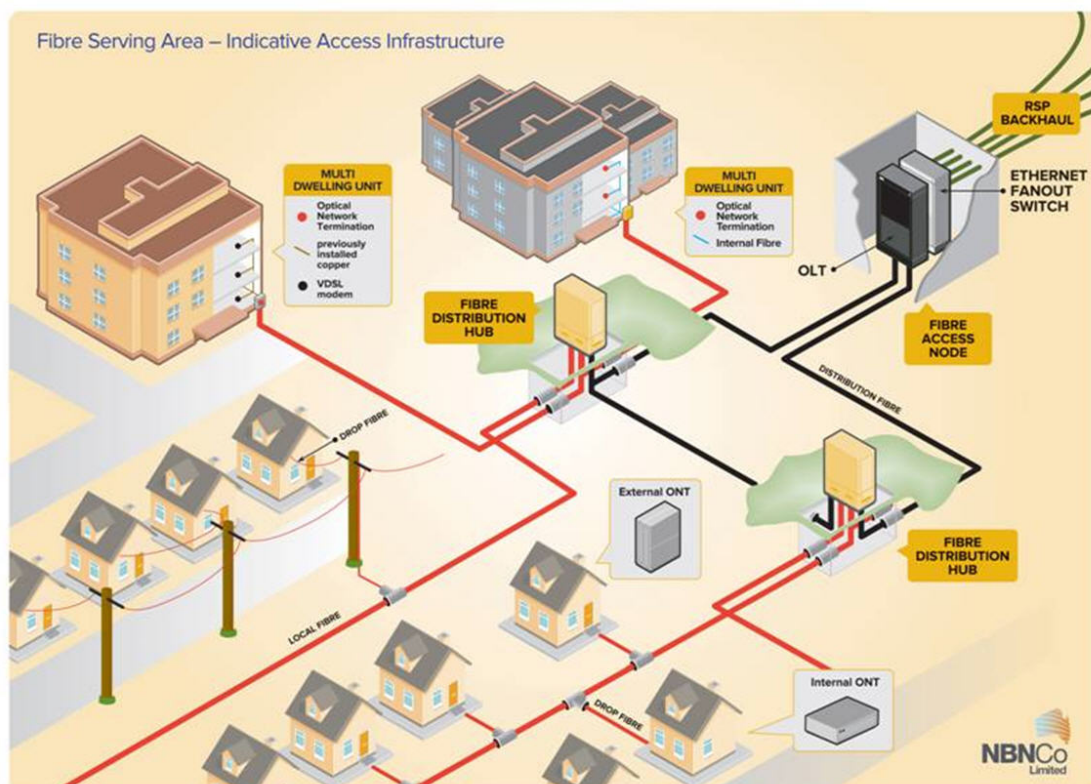
Source NBN Co website <<http://www.nbnco.com.au/our-network/maps.html>>

24. The NBN will be an 'open access' network, which means that NBN Co will be a wholesale-only company that provides the basic fibre infrastructure and a 'Layer 2 bitstream' service, which retail service providers (RSPs) will be able to draw upon on an equal basis.³⁹ Only RSPs will deal with end-user customers and offer a range of higher level products. This structure is different from the 'vertically integrated' structure currently in place for most of the existing copper network, in which Telstra is both the wholesale infrastructure owner and a retail service provider. The fibre-based NBN, which will eventually replace the copper network, will therefore structurally reform the telecommunications industry in addition to providing new infrastructure.

³⁹ NBN Co, *Corporate Plan 2011–2013*, pp. 12, 49.

25. Figure A.4 gives an overview of the typical infrastructure that will be used to deliver the NBN's fibre network in each of around 980 fibre serving areas (FSAs) around Australia.⁴⁰ The NBN distribution fibre will connect to retail backhaul networks at what is known as a Point of Interconnect (PoI) (the Fibre Access Node shown in Figure A.4 incorporates a PoI).

Figure A.4 Indicative NBN infrastructure design: a typical Fibre Service Area (with POI)



Source NBN Co, Consultation Paper: Connecting to the National Broadband Network (Fibre Network), 25 October 2010 < <http://www.nbnco.com.au/assets/documents/connecting-to-the-fibre-network.pdf> > viewed 22 August 2011.

26. Following extensive public debate and the Australian Competition and Consumer Commission (ACCC) advice on the matter, in December 2010 the government and NBN Co announced that there would be initially 120 PoIs, only in locations that have competitive backhaul available. This 'semi-distributed' model was designed to balance the competing goals of competition on backhaul infrastructure with the Government's commitment to uniform national wholesale pricing across Australia.⁴¹ For

40 NBN Co, *Corporate Plan 2011–2013*, p. 79.

41 See Penny Wong and Stephen Conroy, *Statement of Expectations*, 17 December 2010 and Australian Competition and Consumer Commissions, *ACCC Advice to Government: National Broadband Network Points of Interconnect*, November 2010.

Fibre Access Nodes without a PoI, the NBN will supply its own 'transit' backhaul fibre to the nearest PoI.

27. Downstream from the Fibre Access Node, distribution fibre will be laid out to connect a network of Fibre Distribution Hubs, each connecting to around 200 premises using local and drop fibre. Gigabit Passive Optical Network (GPON) technology will be used to deliver fibre connections capable of speeds of around 2500 Mbit/s downstream and 1250 Mbit/s upstream, shared by up to 32 premises.⁴² Given that not all connections are likely to be used simultaneously and that data is usually transmitted in bursts not continuously, GPON is capable of fulfilling the government's requirement of providing speeds in excess of 100 Mbit/s to each of the 32 premises being served.
28. As demand for bandwidth increases in the future, it would be relatively inexpensive to replace the GPON components with newer technology that allows for even more bandwidth over the same fibre network.⁴³ NBN Co has also indicated that point-to-point (PtP) fibre connections will be made available for some business users, meaning bandwidth would not need to be shared with other premises at all.⁴⁴
29. The fibre cables that make up the network will be primarily underground, although around 25 per cent of premises will have overhead cables.⁴⁵ Each of the premises on the network will be equipped with an internal or external Optical Network Termination (ONT). Multi-dwelling units (MDUs), such as apartment blocks, will be equipped with fibre to individual premises using internal fibre.⁴⁶ Individual householders may connect their devices through to the ONT (or a connected internal device) using standard telephone or Ethernet cables, or by setting up a local wireless network using a wireless router.
30. On 1 June 2011, NBN Co announced that it had signed a 10 year contract with Ericsson to build and operate the fixed wireless component of the NBN using 4G Long Term Evolution (LTE) technology.⁴⁷ The fixed

42 NBN Co, *Corporate Plan 2011-2013*, p. 49; Paul Budde Communication, *Australia – National Broadband Network – NBN Co and Infrastructure*, 15 November 2010, p. 6.

43 Ayre *et al.*, 'A Guide to Broadband Technologies', *The Australian Economic Review*, vol. 43, no. 2, June 2010, p. 204. See also NBN Co, *Corporate Plan 2011-2013*, p. 75 for a discussion of the potential upgrade path for the fibre network, potentially delivery speeds of 100 Gbit/s by 2030–35.

44 NBN Co, *Corporate Plan 2011-2013*, p. 135.

45 NBN Co, *Corporate Plan 2011-2013*, p. 52.

46 NBN Co, *Corporate Plan 2011-2013*, p. 49.

47 NBN Co, 'NBN Co selects fixed wireless network partner for mid-2012 service start', *Media Release*, 1 June 2011.

wireless network will offer peak speeds of 12 Mbit/s and is expected to begin offering services from mid-2012, with the network complete by 2015. In February 2011, NBN Co had announced that it had acquired 2.3 GHz and 3.4 GHz spectrums from AUSTAR,⁴⁸ and additional spectrum was purchased in July 2011.⁴⁹ The first communities to receive fixed wireless NBN services are expected to be the areas surrounding Ballarat, Darwin, Geraldton, Tamworth and Toowoomba.⁵⁰

31. At the time of writing, the precise details of the satellite broadband service that will be delivered to the remaining three per cent of the population had not yet been announced. The NBN Implementation Study recommends that NBN Co launch two 'next-generation' GEO satellites operating over the Ka band, which would provide substantially better service than the current Ku band satellites and meet the objective of delivering broadband with peak speeds of at least 12 Mbit/s download across the country. However, mainly due to the latency effect inherent in high-orbiting satellites, it is expected that satellite broadband will only be taken up by customers who cannot access fibre or wireless services.⁵¹
32. Given that the time taken to design and launch a new satellite is around three to four years,⁵² NBN Co began offering an interim satellite solution in July 2011 using spare capacity on existing satellites.⁵³ The Interim Satellite Service is a substitute for the Government's expiring Australian Broadband Guarantee program, and delivers peak speeds of around 6 Mbit/s. The long term satellite solution is expected to be deployed by 2015.⁵⁴

The NBN fibre roll out plan

33. NBN Co plans to achieve full roll out the NBN by 2021, around nine and a half years after completion of the mainland first release sites.⁵⁵ Although

48 NBN Co, 'NBN Co acquires AUSTAR spectrum for rural and regional network', *Media Release*, 17 February 2011.

49 NBN Co, 'Spectrum win brings wireless broadband to rural areas', *Media Release*, 13 July 2011.

50 NBN Co, 'First communities for National Broadband Network fixed wireless service unveiled', *Media Release*, 3 August 2011.

51 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 294.

52 McKinsey-KPMG, *National Broadband Network Implementation Study*, 2010, p. 293.

53 NBN Co, 'NBN Co launches Interim Satellite Service for remote Australians', *Media Release*, 1 July 2011.

54 NBN Co, *Corporate Plan 2011-2013*, pp. 21, 71-72.

55 NBN Co, *Corporate Plan 2011-2013*, p. 77.

precise fibre coverage details will not be known until later in the construction period, NBN Co has indicated that fibre will be deployed to all mainland communities with over 1000 premises, in addition to communities with more than 500 premises that are passed by transit backhaul routes.⁵⁶ NBN Co has also announced that it is trialling a fibre extension program in early roll out sites in Tasmania, in which premises outside the proposed fibre footprint can be connected with fibre if they agree to pay the additional incremental cost involved.⁵⁷

34. The Regional Backbone Blackspots Program (RBBP) is being funded by the government to fill gaps in existing fibre 'backbone' infrastructure that will be utilised under the NBN. The term 'backbone' refers to the main backhaul fibre routes that connect major towns and cities. Locations to be linked include Longreach and Emerald in QLD, Geraldton in WA, Darwin in NT, Broken Hill in NSW, Victor Harbor in SA and South West Gippsland in VIC. All links are expected to be in place by the end of 2011. As of July 2011, the RBBP links to Geraldton, Victor Harbor and South West Gippsland had been completed, enabling new services to be provided by ISPs in those locations.⁵⁸
35. On 8 April 2009, the government announced that the NBN would begin being rolled out in Tasmania.⁵⁹ In July 2009, Smithton, Scottsdale and Midway Point were announced as the 'Stage 1' pre-release trial sites where the roll out would begin. NBN Tasmania Limited was created to oversee the wholesale roll out of the network in Tasmania and was established as a wholly owned subsidiary of NBN Co.⁶⁰ Seven more 'Stage 2' towns were announced in October 2009,⁶¹ and four larger 'Stage 3' locations in March 2010.⁶² Figure A.5 shows the location of these sites.

56 See NBN Co, *Corporate Plan 2011-2013*, pp. 63-64 for detailed coverage maps.

57 Mr Mike Quigley, Chief Executive Officer, NBN Co, *Committee Hansard*, Sydney, 29 April 2011, p. 4.

58 Department of Broadband, Communications and the Digital Economy (DBCDE), 'National Broadband Network: Regional Backbone Blackspots Program' <http://www.dbcde.gov.au/broadband/national_broadband_network/national_broadband_network_Regional_Backbone_Blackspots_Program> viewed 18 July 2011.

59 Prime Minister, Premier of Tasmania, Minister for Broadband, 'Tasmania first to receive superfast broadband', *Joint Media Release*, 8 April 2009.

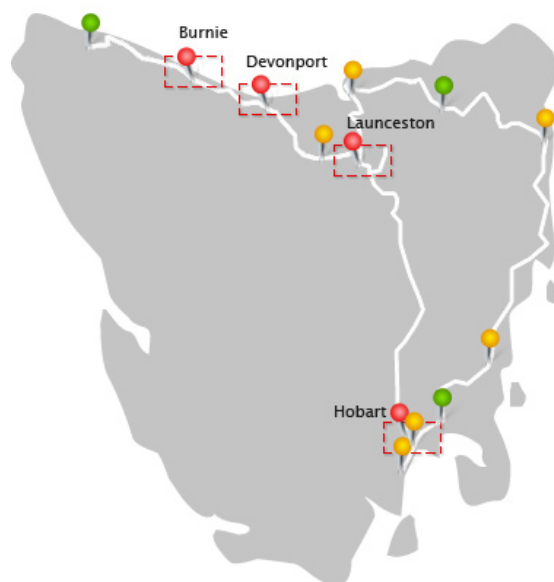
60 Prime Minister, Premier of Tasmania, Minister for Broadband, 'Smithton, Scottsdale and Midway point first towns for National Broadband Network in Tasmania', *Joint Media Release*, 25 July 2009.




61 Prime Minister, Premier of Tasmania, Minister for Broadband, 'Seven new locations to receive superfast broadband in Tasmania', *Joint Media Release*, 21 October 2009.

62 Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, '\$100 million injected into NBN Tas as Stage 3 roll out is announced', *Media Release*, 1 March 2010.

NBN trial services were launched in the Stage 1 sites in August 2010,⁶³ and construction start dates and fibre maps were released for the Stage 2 sites in April 2011.⁶⁴

Figure A.5 NBN first, second and third stage rollout sites in Tasmania



 Stage 1 Communities	 Stage 2 Communities	 Stage 3 Communities
Midway Point Scottsdale Smithton	Deloraine George Town Kingston Beach Sorell South Hobart St Helens Triabunna	Burnie Devonport Hobart Launceston

Source Australian Government, National Broadband Network website < <http://www.nbn.gov.au/follow-the-rollout/tasmanian-rollout/> > viewed 19 July 2011.

36. On 2 March 2010, five 'first release' trial FTTP sites were announced for the mainland – Brunswick (Victoria), Townsville (Queensland), Minnamurra and Kiama Downs (NSW), Armidale (NSW) and Willunga (SA).⁶⁵ Fourteen more release sites around mainland Australia (and extended coverage in the five first release sites) were announced on 8 July 2010.⁶⁶ Figure A.6 shows the location of these sites. User trials of the first

63 NBN Tasmania Limited, 'Australia's first NBN opens in Tasmania – offers blistering speeds', *Media Release*, 12 August 2010.

64 NBN Co, 'Construction to start on NBN in next seven Tasmanian locations', *Media Release*, 28 April 2011.




65 NBN Co, 'NBN Co announces "first release" sites for high-speed network', *Media Release*, 2 March 2010.

66 NBN Co, 'NBN Co announces next rollout locations', *Media Release*, 8 July 2010.

mainland services (beginning in Armidale) were launched by the Prime Minister on 18 May 2011.⁶⁷

Figure A.6 NBN first release and RBBP locations on mainland Australia



 RBBP priority location	 First release sites	 Second release sites
Geraldton (WA) Darwin (NT) Victor Harbor (SA) Emerald (QLD) Longreach (QLD) Broken Hill (NSW) Sale (VIC) Wonthaggi (VIC)	Willunga (SA) Townsville (QLD) Armidale (NSW) Kiama Downs (NSW) Brunswick (VIC)	Gungahlin (ACT) Riverstone (NSW) Coffs Harbour (NSW) Casuarina (NT) Inner North Brisbane (QLD) Springfield Lakes (QLD) Toowoomba (QLD) Modbury (SA) Prospect (SA) Bacchus Marsh (VIC) South Morang (VIC) Geraldton (WA) Mandurah (WA) Victoria Park (WA)

Source Australian Government, National Broadband Network website < <http://www.nbn.gov.au/follow-the-rollout/australian-mainland-rollout/> > viewed 19 July 2011.

37. Figures A.7 and A.8 provide an indication of the expected deployment timeframes for the NBN.

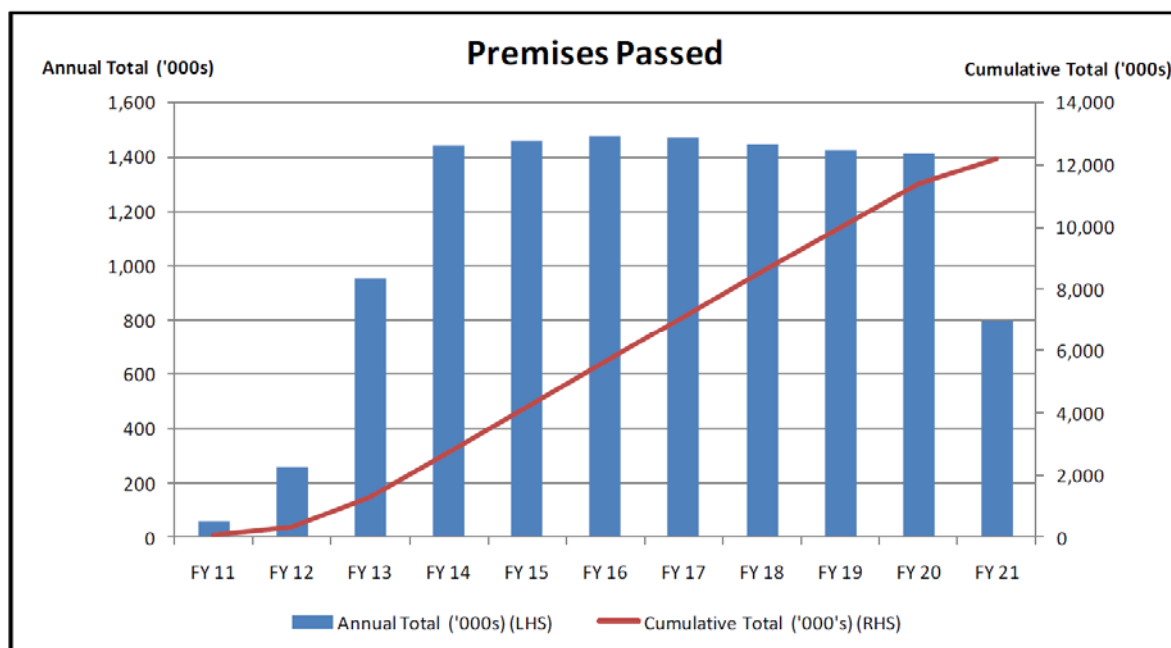
67 Prime Minister, 'Historic launch of NBN in Armidale', Media Release, 18 May 2011.

Figure A.7 NBN Deployment Schedule to FY2021

Deployment Schedule to FY2021											
June YE	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021
(Premises)											
Fibre Premises Passed ('000s)	58	316	1,268	2,711	4,173	5,647	7,116	8,564	9,989	11,403	12,202
Fibre Premises Passed Daily Run Rate (250 Working Days / Year)	0	1	4	6	6	6	6	6	6	6	3
Fibre Premises Connected ('000s)	35	137	511	1,589	2,616	3,679	4,712	5,708	6,672	7,623	8,320
Fibre Premises Connected Daily Run Rate (250 Working Days / Year)	0	0	1	4	4	4	4	4	4	4	3
Wireless & Satellite Premises Covered ('000s)	165	179	447	545	770	813	858	904	950	962	974
Wireless & Satellite Premises Connected ('000s)	0	13	55	102	151	165	181	198	215	222	229
Total Premises Connected - All Platforms	35	150	566	1,691	2,767	3,845	4,893	5,905	6,887	7,845	8,549

Source NBN Co, Corporate Plan 2011-2013, p. 77.

Figure A.8 NBN Fibre Premises Passed Targets



Source NBN Co, Corporate Plan 2011-2013, p. 83.

38. NBN Co has divided the network into 16 Roll-out Regions in which fibre will be deployed concurrently during the full scale construction period.⁶⁸ Precise details of when each area can expect to be connected to the fibre network have not yet been announced.
39. During the rollout of the NBN to existing premises, it is estimated that an addition 2 million new 'greenfields' premises will be constructed.⁶⁹ Under the government's policy announced on 9 December 2010, NBN Co will be responsible for installing fibre at all broadacre developments (i.e. those in

68 NBN Co, Corporate Plan 2011-2013, p. 79.

69 NBN Co, Corporate Plan 2011-2013, p. 23.

previously undeveloped areas) and at infill developments (i.e. those in areas which are already developed) with 100 or more premises.⁷⁰ NBN Co intends to procure contractors to deliver fibre to these developments.⁷¹ Telstra will remain responsible for providing infrastructure (primarily copper) to infill developments with less than 100 premises.

40. On 23 June 2011, NBN Co signed binding definitive agreements with Telstra to help facilitate the efficient rollout of the NBN.⁷² Under the agreements, Telstra will progressively migrate its customers over to the NBN fibre network as it is rolled out and NBN Co will be given access to Telstra's existing infrastructure, including lead-in conduits, pits, ducts, backhaul fibre and exchange space. The deal is subject to approval by Telstra shareholders and review by the ACCC. On the same day, NBN Co also announced it had signed a binding agreement with Optus (also subject to ACCC review).⁷³ Under that agreement, Optus has agreed to migrate its HFC customers to the NBN and decommission the non-essential parts of its HFC network.

70 Senator the Hon Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, 'Provision of Fibre in New Developments', *Media Release*, 9 December 2010.

71 NBN Co, *Corporate Plan 2011-2013*, p. 46.

72 NBN Co, 'NBN Co and Telstra Sign Binding Definitive Agreements', *Media Release*, 23 June 2011.

73 NBN Co, 'NBN Co and Optus Sign Binding Agreement', *Media Release*, 23 June 2011.

