5

Services in Regional and Remote Australia

5.1 In its Second Review, the committee reported on access to broadband services in regional and remote areas in Australia and made recommendations on the impending delivery of the National Broadband Network (NBN). Since tabling its report in November 2011, significant milestones have been reached in the delivery of services to regional and remote Australia and public discussion is increasingly focussed on how these communities can maximise the benefits of new public infrastructure.

5.2 All three technologies, fibre, wireless and satellite, will be used to rollout the NBN to regional and remote Australia. In accordance with the Government's Statement of Expectations and the NBN Co Corporate Plan 2011-2013, the 'last 7%'[1] of premises that do not fall within the fibre footprint will be serviced by either a fixed wireless or satellite connection. These technologies are used to reach areas of low population density that make it 'both difficult and expensive to build infrastructure' to these premises.[2] Consequently, the 'last 7%' are towns located in regional and remote Australia.

5.3 This chapter discusses all three technologies in turn and canvasses the key opportunities, challenges and concerns that regional and remote Australia will face in receiving high-speed broadband. The chapter notes that some concerns are amplified depending on the technology that will service these communities.

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1 NBN Co, *Corporate Plan 2011-2013*, p. 69.

2 NBN Co, *Corporate Plan 2011-2013*, p. 69.

Fibre

5.4 Seventy per cent of regional Australia will receive fibre.[3] This section presents evidence received by the committee from regional and remote Australia on how the NBN will affect their local communities.

5.5 Following an informative visit to Broken Hill in New South Wales in July 2011, the committee elected to travel to another regional centre for its Third Review. To mirror the increasing public discussion about how and why high-speed broadband will change regional Australia, the committee elected to visit a regional town where the rollout was nearing completion and such debate had concrete, direct relevance.

5.6 On 30 April 2012, the committee travelled to Willunga for a site inspection and a public hearing.[4]

Case Study: Willunga, South Australia

5.7 Willunga was announced as one of the five first-release sites, covered 940 premises with 91 per cent of properties consenting to the installation of fibre optic cables to their premises.[5] Commercial services have been available to residents since 30 September 2011.

5.8 Willunga was chosen by the NBN Co as a first-release site to demonstrate and test the fibre network's design in a deployment area with dispersed housing. According to the NBN Co, 'Willunga represents some of the diversity of housing types and situations that the NBN Co will encounter across Australia in the volume rollout'.[6] Willunga was also the only first release site where NBN Co installed new pits and pipes rather than use existing ducts.[7]

5.9 During its inspection, the committee viewed a fibre distribution hub, a multiport and zone terminal and the main joint. Figure 5.1 shows the street infrastructure that supports the NBN fibre network.

3 Senator the Hon Stephen Conroy, Minister for Broadband and Communications and the Digital Economy, 'National Press Club Address', 13 December 2011.

4 The committee held a public hearing with witnesses from Onkaparinga City Council, Willunga Business and Tourism Association, Tatachilla Lutheran College, and a local small business, Office & Image.

5 NBN Co, 2011, *National Broadband Network goes live in Willunga*, media release, 16 September.

6 NBN Co, 2011, *National Broadband Network goes live in Willunga*, media release, 16 September.

7 NBN Co, 2011, *National Broadband Network goes live in Willunga*, media release, 16 September.

Figure 5.1 Inspection of Willunga, South Australia

Source *Committee Inspection, 30 April 2012, Willunga, South Australia*

5.10 As Willunga is one of only five sites on mainland Australia with a fibre connection, the local community was eager to discuss the burgeoning opportunities that the new infrastructure will bring for regional Australia. Notably, the Willunga Business and Tourism Association stated:

> ... we are still in a pilot situation. We are still learning what this National Broadband Network, the technology, the infrastructure is, as well as the errors that can occur.[8]

5.11 Similarly, Office & Image, a local business with a live NBN connection, commented:

> It is still very early days in setting up the foundation of the NBN, which bring lots of excitement and possibilities for the businesses and community in Willunga.[9]

Strategies of Local Government

5.12 The City of Onkaparinga Council (the Council) is South Australia's largest council and services both urban and regional communities in the region.

8 Mr Thomas Herbert Laing, Secretary, Willunga Business and Tourism Association, Transcript of Evidence, Willunga, 30 April 2012, p. 7.

9 Mrs Lesley Bakker, Proprietor, Office & Image, Transcript of Evidence, Willunga, 30 April 2012, p. 12.

The Council covers 68,000 premises, with 168,000 residents, and is developing an array of programs and services to capitalise on new opportunities.[10] This includes preparing a new long-term digital economy strategy. Its Chief Executive Officer stated:

> The first step [of preparing the new strategy] will be a visioning workshop, which will be held in June [2012]. It will start with a visioning of what a fully enabled NBN region, could, should and would look like and perform in 15 years time. Then we will be preparing a five-year implementation plan and rollout one-year plans from there.[11]

5.13 The Council is also developing programs that will bring immediate outcomes. The Council stated:

> ... we continue to work with the implementation of the Digital Enterprise program, which is funded by the federal Department of Broadband, Communications and the Digital Economy; the implementation of the Digital Hubs program; and the implementation of the Digital Local Government program, which will focus on one aspect of our business—delivering development application services online, which is a big move for council, with a focus on videoconferencing, also at the Willunga hub.[12]

5.14 In May 2011, Senator Stephen Conroy, Minister for Broadband, Communications and the Digital Economy launched the National Digital Economy Strategy. One of its eight goals is to improve online government service delivery and engagement so that, by 2020, four out of five Australians will choose to engage with government through online services.[13] Working towards this goal, the Government announced the $17.1 million Digital Local Government program (the DLG program) providing funding to local governments in first release sites. Following an initial round, an expanded second round was open to 20 local government councils and closed on 31 March 2012.

5.15 The aim of the DLG program is to encourage the development of online services that are replicable and scalable, and that other local governments across Australia can adapt for their purposes. According to the Department of Broadband, Communications and the Digital Economy

10 Mr Mark Dowd, Chief Executive Officer, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 2.

11 Mr Dowd, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 2.

12 Mr Dowd, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 2.

13 Department of Broadband, Communications and the Digital Economy, (DBCDE), 2011, 'National Digital Economy Strategy: Government Services' <www.nbn.gov.au>, viewed 7 May 2012.

(DBCDE), the program 'has the potential to encourage a step change in the quality, availability and speed of local government services'.[14]

5.16 Under a DLG grant, the Onkaparinga Council is:

> ... developing an online process for preliminary advice, lodgement, assessment and enforcement of development applications, including high-definition videoconferencing sessions with council's development services staff and applicants.[15]

5.17 Other regional councils who received grants under the DLG program are working to develop online services including a video-based online emergency management system, and video-conferencing systems for web-based interactive engagement between councillors and the public.[16] However, most grants allocated were to assist local governments to design online services for development applications similar to that of the Onkaparinga Council.

5.18 Another focus of the Council is the development public access points (libraries and communities centres) and e-literacy within their wards:

> Libraries are probably the greatest source of council goodwill to the community. What the NBN provided has just added onto that goodwill already. The Forward IT program that we did in conjunction with the Department of Further Education, Employment, Science and Technology... indicated that people really prefer to work through an area they trust, such as a library, and will continue to do so. It has provided the library service with an additional way of dealing with the community or providing a service to the community. [17]

Business Opportunities

5.19 The capacity of high-speed broadband to bring new business opportunities, open new markets and increase commercial efficiency is substantial. Economic modelling shows that regional Australia stands to benefit more than metropolitan areas from increased internet connectivity. On average, a 10 per cent increase in connectivity would raise regional

14 DBCDE, 'Digital Local Government program', <www.dbcde.gov.au>, viewed 7 May 2012.

15 DBCDE, 'Digital Local Government program – synopsis of round one projects', <www.dbcde.gov.au>, viewed 7 May 2012.

16 DBCDE 'Digital Local Government program – synopsis of round one projects', <www.dbcde.gov.au>, viewed 7 May 2012.

17 Mr Brian Hales, Economic Development Advisor, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 4.

output by 0.53 per cent compared with a 0.38 per cent increase in metropolitan areas.[18]

5.20 The Onkaparinga Council highlighted the changing industries which regional areas support and stated:

> South Adelaide has seen some major shifts in its economic fortunes since the mid-2000s with the closure of some of its largest businesses, Exxon Mobil and Mitsubishi. Our response to that was to prepare the Southern Adelaide Economic Development Plan, which focused on diversifying and modernising the economy. This will be based more and more on trade in ideas and knowledge, and high-speed broadband is critical component of this.[19]

5.21 Multiple witnesses commented that Australian and global demand (from both the consumer and from a business perspective) is moving more and more to an online platform.[20] The Council was of the view that 'the massive expected global growth in online business will be a significant catalyst for new business investment, formation and transformation into the 21st century'.[21]

5.22 Since the committee's visit, the Council, in partnership with the Willunga Business and Tourism Association, the Southern Success Business Enterprise Centre and the Onkaparinga Exporters Club has launched a series of workshops. The program aims to provide advice to small and medium-size businesses and not-for-profit organisations on:

> ... taking advantage of the NBN through such things as improving their online presence, transacting online, expanding their market and reach into the community and better servicing customers.[22]

5.23 The Council was awarded $411,950 under the Digital Enterprise Program to develop such services in their community.

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18 Allen Consulting Group, *Quantifying the economic gains of getting more Australian households online*, November 2010, pp 36–38.

19 Mr Dowd, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 1.

20 Mr Dowd, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 1; Mr Laing, Willunga Business and Tourism Association, Transcript of Evidence, Willunga, 30 April 2012, p. 7.

21 Mr Dowd, City of Onkaparinga, Transcript of Evidence, Willunga, 30 April 2012, p. 1.

22 Conroy, S (Minister for Broadband, Communications and the Digital Economy) 2011, *Call for Applications for Digital Economy Initiatives*, media release, Parliament House, Canberra, 8 September.

Customer Support in Transition

5.24 Importantly, Mr Thomas Laing reported his initially unsatisfying experience of connecting to the NBN following its rollout in Willunga and stated:

> In my own case I was really frustrated. I waited until September-October. I was with Telstra and I had no response and no indication from them about things. I went to iiNet. They were not able to service me straight away. That was in October. I went back to them in December and they kicked it into gear in January. If [ISPs] had had a tech bloke on the ground, it might have got sorted out a lot more quickly.[23]

5.25 Further, Mr Laing also commented on the download speeds offered and stated:

> We are on the 25/5 [25Mbps downlink/5Mbps uplink] plan and that is not much better than dial-up or what we were on with ADSL. So the promises about speed and reliability are suspect and questionable. But, as I say, those who are on the high-speed plans – the 50 or 100 plans - are not complaining at all.[24]

5.26 As more consumers are connected to the NBN, the committee hopes that the rate of competition within the sector will increase so that affordable, high-speed plans that maximise the speed of the network will be offered.

Fixed Wireless Services

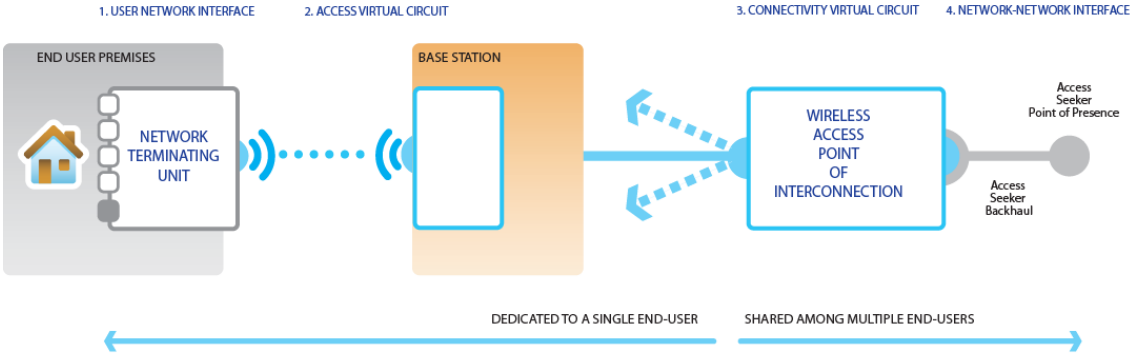
Background

5.27 The NBN Co Wireless Access Service (WAS) consists of a number of components that will be used by access seekers to supply services to retail service providers (RSPs) or end-users. These include a network terminating unit (the NBN box that is located within individual premises), a base station antennae located externally on the premises, and a wireless access point of interconnection (a wireless tower). Figure 5.2 shows the different components.

23 Mr Laing, Willunga Business and Tourism Association, Transcript of Evidence, Willunga, 30 April 2012, p. 7.

24 Mr Laing, Willunga Business and Tourism Association, Transcript of Evidence, Willunga, 30 April 2012, p. 7.

Figure 5.2 Overview of the NBN Co Wireless Product



Source *NBN Co, Corporate Plan 2011-2013, page 95.*

5.28 The NBN Co Corporate Plan 2011-2013 identifies that the WAS will deliver speeds of 12 megabits per second (Mbps) downstream and 1Mbps upstream, and become available in the second half of 2012, with full rollout of the service occurring progressively over the period 2012-2015.[25] The deployment of the wireless network is scheduled to be completed by mid 2015.[26]

5.29 Importantly, there has been a degree of public confusion about whether the WAS will operate in similar ways to current mobile telephone wireless services. This confusion is understandable as the average consumer is unlikely to be aware of the infrastructure supporting their service, and the perception that a 'wireless' service will grant 'mobility'. The WAS will operate as a fixed wireless service.

5.30 A fixed wireless service differs from mobile wireless networks as a fixed service is designed to support a dedicated number of premises, each with a wireless receiver affixed externally to the property. This enables the delivery of a more predictable level of service performance to premises compared to a mobile wireless network which is focussed on mobility.[27]

5.31 On the issue of speed on the WAS, the Berrigan Shire Council relayed information provided to them from the NBN Co and stated:

> They said they would be able to do everything that would be likely to be required for our community. ... They said that should be more than sufficient for what you need in terms of the speed we require.[28]

25 NBN Co, *Corporate Plan 2011-2013*, p. 95.

26 NBN Co, 2012, *Fibre Servicing Area Scheduling Rules*, 30 April 2012, <www.nbnco.com.au>, viewed 9 May 2012.

27 NBN Co, 2011, *NBN Co selects fixed wireless network partner for mid-2012 service start*, media release, 1 June.

28 Mr Matthew Hansen, Director, Corporate Services, Berrigan Shire Council, Transcript of Evidence, Sydney, 16 April 2012, p. 24.

5.32 The NBN Co confirmed:

> The service will be identical everywhere in the wireless footprint—as close as you can get with technology. There will be no difference whether a wireless service is delivered in remote Australia or if it is delivered just outside a city.[29]

Rollout Progress

5.33 In August 2011, the NBN Co announced the first release sites for the WAS: Geraldton (Western Australia), Toowoomba (Queensland), Tamworth (New South Wales), Ballarat (Victoria) and Darwin (Northern Territory).[30] The Shareholder Ministers' second NBN rollout Performance Report (the Performance Report) stated that as of 31 December 2011, the NBN Co had commenced construction in twelve wireless first release sites.[31]

5.34 As at 31 December 2011 the NBN Co had work under way for 1,952 premises in the wireless footprint. The NBN Co defines 'work under way' as the 'number of premises in rollout areas currently undergoing construction activities, where NBN Co has issued a Contract Instruction to a Subcontractor, but it is not deemed passed'.[32]

5.35 The WAS will require the use of approximately 2300 masts or wireless monopole towers. Where possible, the NBN Co has committed to using existing telecommunications masts and any new constructions will require development approval from the relevant local government authority.[33]

Trial Phase

5.36 As the wireless access service enters the next phase, the NBN Co has commenced trials for RSPs. The NBN Co Wireless Trial Agreement provides for RSPs to participate in the two test and trial phases of the WAS. The first phase involved a business readiness testing phase in Armidale, occurring in February and March 2012. Twelve RSPs submitted requests to participate in the first test, with five providers selected to participate based on a structured process and 'rigorous selection criteria'.[34]

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29 Mr Mike Quigley, Chief Executive Officer, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 50.

30 NBN Co, 2011, *First communities for NBN fixed wireless service unveiled*, media release, 3 August.

31 Shareholder Ministers, 'Performance Report to 31 December 2011' *Submission 12*, p. 12.

32 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 28.

33 NBN Co, 2011, *NBN Co selects fixed wireless network partner for mid-2012 service start*, media release, 1 June.

34 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 9.

5.37 A second phase began on 2 April 2012 and will run until 30 September 2012. The second test is available to all access seekers. The second trial will occur in an expanded number of first release sites (Armidale, Tamworth and Toowoomba) and allows both NBN Co and access seekers to test and verify their products, systems and processes.[35]

Satellite Access Service

Background

5.38 The NBN Co Satellite Access Service (SAS) will include product features such as increased capacity and return path speeds that are designed to support large file transfers and real time video communications.[36] The Performance Report stated:

> The satellites... will provide around three per cent of Australian premises outside of areas covered by fibre and fixed-wireless technologies with access to high-speed broadband. The satellites are designed to provide initial peak speeds of 12/1 Mbps [12 Mbps download/1Mbps uplink].[37]

5.39 Similar to the WAS, the SAS consists of a number of components which are used by access seekers to provide a service to consumers. The two major components of the SAS are the space segment and the ground segment. In addition there is also local infrastructure installed on each of these premises.

5.40 The satellites will provide service to remote Australia, as well as coastal islands and external territories including Norfolk Island, Lord Howe Island, Cocos and Keeling Islands, Christmas Island and Macquarie Island in Antarctica. These services will be provided to the 'final 3 per cent' of premises falling outside of the fibre or fixed wireless footprints.[38]

5.41 The NBN Co expects that the number of premises falling within the satellite servicing area will grow from 332 000 (current) to 399 000 by

35 NBN Co, 2012, *Wireless Trial Agreement*, <www.nbnco.com.au> viewed 29 February 2012.

36 Australian Government, February 2012, *Response to the Joint Committee on the National Broadband Network First Report on 31 August 2011*, p. 26.

37 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 13.

38 NBN Co, 2012, *NBN Co selects Space Systems/Loral for communications satellites*, media release, 8 February.

2025.[39] The NBN Co Corporate Plan 2011-2013 estimates the following cumulative take up rates:

- 106 000 by financial year (FY) 2021
- 120 000 by FY 2025
- 139 000 by FY 2030.[40]

5.42 Reflecting an increase in the number of premises in the satellite footprint, the NBN Co released revised cumulative take up forecasts of:

- 129 000 by FY 2021
- 144 000 by FY 2025
- 170 000 by FY 2030.[41]

5.43 According to the Australian Communications Consumer Action Network (ACCAN), the SAS will provide better services to consumers. The ACCAN stated:

> Certainly they provide a more reliable and faster speed, based on the advertised information.[42]

5.44 However, the Performance Report clarified:

> Speeds actually achieved by retail customers (end users) will depend on a number of factors including the quality of their equipment and in-premises connection, the broadband plans offered by their Access Seeker and how their Access Seeker designs its network to cater for multiple end users.[43]

Infrastructure

Space Segment

5.45 On 8 February 2012, the Prime Minister and the Minister for Broadband, Communications and the Digital Economy announced that Space Systems/Loral had been awarded the contract for the build of the two satellites of the SAS space segment. [44] The design for the spacecraft was

39 NBN Co, Answers to Questions on Notice: Question No 285, Senate Standing Committee on Environment and Communications, Additional Estimates Hearing, February 2012.

40 NBN Co, Answers to Questions on Notice: Question No 285, Senate Standing Committee on Environment and Communications, Additional Estimates Hearing, February 2012.

41 NBN Co, Answers to Questions on Notice: Question No 285, Senate Standing Committee on Environment and Communications, Additional Estimates Hearing, February 2012.

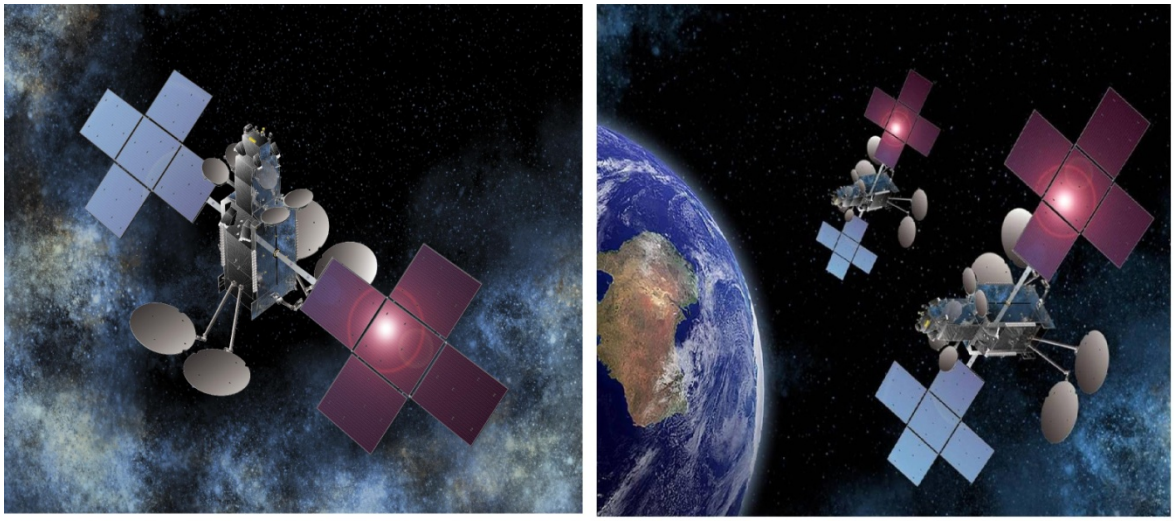
42 Mr Jonathan Gadir, Senior Policy Adviser, Australian Communications Consumer Action Network (ACCAN), Transcript of Evidence, Sydney, 16 April 2012, p. 4.

43 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 21.

44 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 13.

developed by the NBN Co, with refined technical requirements developed 'through detailed engagement and high level design with participating suppliers'.[45] The contracting process for the satellite infrastructure is discussed in Chapter 4.

Figure 5.3 Space Segment of the NBN Co Satellite Access Service



Source *NBN Co, 'NBN Co selects Space Systems/Loral for communications satellites'* Media Release, *8 February 2012.*

5.46 The satellites will individually be able to service 200,000 premises in regional and remote areas of Australia and its external territories. The two satellites will be able to 'load share'[46] to enable optimal services, speeds and reliability.[47]

5.47 As the NBN Co is building a nationally-owned, wholesale-only network, the dimensioning of the satellites will differ to that of commercial operators. The NBN Co provided the following evidence on the dimensioning capacities of the satellites:

> It is not so much speeds; it is a question of the greater the number of subscribers you have. How many gigabytes per month can be delivered reliably to them? ...What we have done is taken a different approach, which is to say: given the coverage, given the number of users we expect to be on this and given the satellite capacity, how do you make sure you manage that capacity so that people in the bush will get a good service?[48]

45 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 12.

46 Mr Quigley, NBN Co, Transcript of Evidence, Senate Environment and Communications Legislation Committee, Canberra, 14 February 2012, p. 174.

47 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 56.

48 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 52.

5.48 The satellites will be launched separately, with the first launching in the first quarter of 2015 and the second being launched at a later date. The NBN Co is yet to determine when the second satellite will be launched.[49] Services will then be available to consumers by mid 2015.[50]

Orbital Slot Allocation

5.49 The International Telecommunications Union (ITU) is responsible for international cooperation in the use of telecommunications and the radiofrequency spectrum, and more specifically, is the international mechanism coordinating the allocation of satellites' orbital slots.

5.50 The ITU is required to allocate spectrum, and register frequency allocation, orbital positions 'to avoid harmful interference between radio stations of different countries'.[51] This task is based on the regulatory procedures of coordination, notification and registration. Under this system, telecommunications companies launching satellites apply to the ITU's Radio Communication Bureau and lodge a request for a specific orbital slot. It is then open to other members of the ITU to lodge objections to that specific slot being allocated to the applying member.

5.51 The DBCDE commented on this process and stated:

> The ITU process is a coordination process for people to register objections ... [I]f there is any suggestion that another party has an interest in this then negotiations will occur but the satellite development process will not be stopped.
>
> This is an administrative coordination process designed to ensure you do not end up with conflicting outcomes rather than one in which you can obtain an approval and sell it to another party.[52]

5.52 The NBN Co has lodged coordination applications with the ITU for four orbital slots for its two commissioned satellites.[53] However, these slots are yet to be secured from the ITU. According to the Government, the confirmation process 'continues with both domestic and international operators'.[54]

5.53 The absence of formal allocation from the ITU is controversial as the final orbital slot and frequency allocation affects the design and construction of the satellites. The NBN Co commented:

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49 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 57.

50 NBN Co, *Submission 15.2*, Answers to Questions on Notice No. 15, p. 7.

51 International Telecommunications Union, *Constitution*, Article 1(2).

52 Mr Peter Harris, Secretary, DBCDE, Transcript of Evidence, Sydney, 16 April 2012, p. 63.

53 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 12.

54 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 12.

> You need to tie down the VSAT uplink and downlink frequencies as well as the gateway uplink and downlink frequencies and you need to know where the satellites are going to be located. That absolutely impacts the radio planning.[55]

5.54 In awarding the satellite construction contract to Space Systems/Loral, the NBN Co has proceeded on the basis that the orbital slots and frequencies applied for will be allocated. The NBN Co was unable to confirm that the satellites will not be launched until the slots have been formally allocated. The NBN Co stated:

> No, I am not prepared to say that. ... If we came to the position where the formalities were not completely finalised, we would probably have a discussion with the ITU about the possibility of launching.[56]

5.55 The NBN Co also confirmed that in the event that an orbital slot is not obtained, it would contract to launch the satellites (a contract that is yet to be awarded).[57] The NBN Co also stated that it:

> ... is not aware of any satellite operator's launch provider being stopped from launching their Satellite by the ITU.[58]

5.56 Further, the NBN Co stated:

> It is not unprecedented that [a telecommunications company] will have a satellite in orbit before the formality of the process is complete. We do not anticipate that ... We expect formalities will completed well before we launch any satellites. ... We expect that process, the ITU coordination process, to be finished well before a launch date.[59]

5.57 The effect on the anticipated launch date of 2015 and the cost of additional works on the satellite is unclear, though the NBN Co stated:

> It is not a question of scrapping the satellite and starting again.[60]

Gateway Segment/Ground Stations

5.58 The second major component of the SAS is the gateway segment. The SAS will require approximately ten ground stations built around Australia to

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55 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 53.
56 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 64.
57 NBN Co, *Submission 15*, Answer to Question on Notice No. 2, p. 2.
58 NBN Co, *Submission 15*, Answer to Question on Notice No. 3. p. 3.
59 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, pp 53-54.
60 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 65.

receive and transmit data signals.[61] Data is sent to the satellite from a large ground station transmitter, and the satellite 'bounces' this information down to the end-users' very small aperture terminal (VSAT) satellite dish.

5.59 The gateway segment will be completed before the launch of the satellites in mid 2015.[62]

5.60 On the progress of the ground stations' construction and development, the Performance Report stated that as of 31 December 2011:

> The ground systems and customer equipment RFT [requests for tender] responses were also received and were being evaluated. Feasibility, quantity surveying and preliminary town planning work commenced on a list of potential radio frequency (RF) gateway sites across the country.[63]

5.61 Since the Performance Report, Merimbula, on the New South Wales (NSW) far south coast was announced as the first satellite ground station gateway.[64] Construction of the facility is due to begin in 2013, and is scheduled to be operational in 2015.[65] The smaller town of Wolumla, located 15 kilometres north-west of Merimbula, will be the site for six satellite dishes. [66]

5.62 Significantly, the NBN Co explained its reasons for selecting Merimbula as the location of the first satellite ground segment and stated:

> Merimbula was chosen for a number of reasons: the climate is perfect for our needs. It's also located close to reliable power and other infrastructure including the NBN's core fibre transit network.[67]

5.63 The issue of climate and weather conditions as a potential impediment to reliable high-speed internet was first raised in the committee's Second Review by M&S Consultants Pty Ltd. M&S Consultants Pty Ltd stated that Ka-band satellites suffer from 'rain fade', and therefore may not be suitable for humid regions as signals cannot penetrate areas of high precipitation.[68]

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61 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April.

62 NBN Co, *Submission 15.2*, Answer to Question on Notice No. 15, p. 7.

63 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 12.

64 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April.

65 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April.

66 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April.

67 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April.

68 Mr Michael Wilson, Director, M&S Consultants Pty Ltd, Transcript of Evidence, Broken Hill, 27 July 2011, p. 12.

5.64 In May 2012, the NBN Co also announced Bourke in the north-west of NSW as being the second location for the SAS ground station gateway. Again, the NBN Co referred to Bourke's 'ideal climate' as being a factor when selecting the site.[69] The facility in Bourke will comprise of 'a single storey building with up to three 13-metre-in-diametre satellite dishes'. [70]

5.65 When making both announcements, the NBN Co stressed that the selection of sites was done 'following extensive consultation' with the relevant local government councils.[71] The announcement of Merimbula and Bourke as prospective sites came before development applications for their construction has been approved by local governments. The NBN Co have committed to providing local residents with more information.[72]

Infrastructure on Premises

5.66 The SAS will also require individual premises to have roof-mounted receivers (VSAT dishes) installed so to receive signals from the satellites. Images of this infrastructure are included in Figure 5.4.

5.67 Similar equipment is needed for those consumers accessing the NBN Co's Interim Satellite Service (ISS) (discussed below). Importantly, for those premises that have ISS-accessible local infrastructure installed, this equipment will need to be replaced to access the (long-term) SAS due to the technology differences between the two services. [73]

69 NBN Co, 2012, *NBN satellite network extends to the outback*, media release, 10 May.

70 NBN Co, 2012, *NBN satellite network extends to the outback*, media release, 10 May.

71 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April; NBN Co, 2012, *NBN satellite network extends to the outback*, media release, 10 May.

72 NBN Co, 2012, *NSW Far South Coast enters space age*, media release, 19 April; NBN Co, 2012, *NBN satellite network extends to the outback*, media release, 10 May.

73 NBN Co, *Submission 15.2*, Answer to Question on Notice No. 15, p. 7.

Figure 5.4 Roof-mounted National Broadband Network Satellite Receiver

Source NBN Co, 'Gallery: What an NBN satellite installation looks like' <www.nbnco.com.au> viewed 28 February 2012.

Interim Satellite Service

5.68 Whilst the infrastructure discussed above is under construction, the NBN Co is providing its ISS on existing third-party owned satellites with speeds of 6Mbps download and 1Mbps uplink. The committee has previously reported on the ISS in its Second Review.

5.69 Launched on 1 July 2011, the ISS trial phase was completed in November 2011. As at 31 December 2011, the ISS covers 165,000 premises, with 2197 premises actively serviced by RSPs. [74] The Performance Report also provided the following updates:

- to ensure mitigation of any implementation issues, since launch, close monitoring of the product content and performance of the satellite service;
- as at 31 December 2011, there were seven RSPs selling services over NBN Co's interim satellite network and there were 2197 active premises; and
- additional satellite capacity was commissioned by using the IPStar satellite. [75]

5.70 On the issue of affordability of services, the ACCAN stated:

> ... as the interim satellite service, for example, becomes a permanent satellite service, the ISPs are going to be able to offer better rates.[76]

74 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 28.

75 Shareholder Ministers, 'Performance Report to 31 December 2011', *Submission 12*, p. 12.

5.71 Although access to the ISS is limited to certain criteria (residents and small businesses located in regional and remote Australia who are unable to access metro-equivalent broadband), it may be this criteria that is dissuading otherwise eligible applicants from submitting requests.[77]

5.72 The public education and marketing of the ISS could be an early opportunity for eligible regional and remote communities to begin the transition envisaged under the National Digital Economy Strategy. It is also an opportunity for the NBN Co to begin its marketing of the (long-term) SAS with connected end-users gaining direct experience in faster broadband and the changes and challenges this brings to community.

Telephony, Broadband and Black Spots

5.73 An ongoing concern raised by regional and remote Australia is the existence of black spots, both in relation to the accessibility of broadband services and the reliability of mobile telephone coverage. In relation to broadband services, the DBCDE stated:

> As NBN Co's next-generation satellite service provides a safeguard to all Australian premises not receiving a fibre or wireless service, there will be no broadband 'black spots' when the NBN is deployed.[78]

5.74 More importantly, there appears to be widespread misunderstanding that the NBN rollout will also provide an upgrade to telephony services around Australia. For example, submissions to the 2011–12 Regional Telecommunications Independent Review raised concerns that existing 'black spots' in mobile telephone and broadband coverage will not be resolved under the NBN rollout.[79]

5.75 Although premises in the fibre footprint will see a transfer of telephony from copper cables to fibre, and the quality of voice over internet protocol (VOIP) services will improve on all three technologies (fibre, fixed

76 Mr Gadir, ACCAN, Transcript of Evidence, Sydney, 16 April 2012, p. 6.

77 Senator the Hon Stephen Conroy, the Minister for Broadband, Communications and the Digital Economy, announced in an opening statement at the Budget Estimates hearing of the Senate Standing Committee on Environment and Communications on 24 May 2012 that the eligibility criteria for the ISS would be expanded. The expanded criteria will extend the eligibility of the ISS to approximately 250 schools, 800 health clinics and 200 local government facilities.

78 DBCDE, *Submission 3.1*, Answer to Question on Notice No. 12, p. 1.

79 State Government of Victoria, *Submission to the Regional Telecommunications Review*, December 2011, p. 20.

wireless and satellite),[80] existing fixed-line telephony services in areas outside of the fibre rollout will not be altered under the NBN rollout.

5.76 Existing infrastructure will provide fixed telephone line connections. Under an agreement between Telstra and the Government, commencing on 1 July 2012, Telstra is required to maintain its existing copper network in areas outside of NBN Co's fibre to the premises network to deliver the standard telephone service. This is Telstra's Universal Service Obligation.[81]

5.77 As a fixed-line-broadband-only initiative, the NBN rollout does not affect mobile-phone coverage in central-business districts, regional communities nor remote townships. The DBCDE stated:

> Terrestrial mobile phone networks have expanded significantly in recent years – and coverage is now claimed to reach about 99 per cent of the Australian population. However, given Australia's vast size, this only means about 25 per cent of the actual landmass is covered. For the most part the recent extension of mobile coverage has been based on commercial decisions by carriers. There is currently no government funded program for the extension of mobile phone coverage.[82]

5.78 The DBCDE foreshadowed a possible use of the NBN Co's infrastructure by the sector and stated:

> In terms of the NBN rollout improving mobile phone access, any new towers that NBN Co may construct for its fixed-wireless network could be accessed by mobile carriers to expand their footprint. NBN Co's next-generation fixed wireless and satellite services will support Voice over Internet Protocol (VoIP) telephone services. However, as these services are fixed services they will not support mobile telephony.[83]

Maintenance and Upgrades

5.79 Since the initial concept of a nationally owned wholesale network was first announced, the flexibility of the network design to accommodate upgrades, and maintenance of the network as the infrastructure ages, have become important community issues.

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80 DBCDE, *Submission 3.1*, Answer to Question on Notice No. 12, pp 1-2.

81 NBN Co, 2011, *First communities for NBN fixed wireless service unveiled*, media release, 3 August.

82 DBCDE, *Submission 3.1*, Answer to Question on Notice No. 12, p. 1.

83 DBCDE, *Submission 3.1*, Answer to Question on Notice No. 12, p. 2.

5.80 The lifespan of the equipment of the fibre network (not including the fibre-optic cable itself) is anticipated to be 15 to 20 years, with upgrades expected before the end of this timeframe.[84]

5.81 The NBN Co stated,

> The design of the passive fibre access network is adaptable and flexible due to the use of International Standards for all of the connectivity points, and the provision of additional fibre to allow for the seamless integration of advancements in Passive Optical Network [PON] transmission technologies without major interruption to the operating end-users.[85]

5.82 Similarly, the design of the active network follows a 'modular approach' where sub-systems are adaptable and flexible due to the use of International Standards for all of the connectivity points. The active network provides for additional capabilities to allow for the seamless integration of advancements in PON transmission technologies without major interruption to the operating end-users.[86]

5.83 If commenced, the NBN Co foreshadowed that such an upgrade would likely target the delivery of faster speeds. The NBN Co stated:

> For example, the [Gigabit Passive Optical Networking] GPON, at the moment, is 2½ gigabits per second down, 1.25 gigabits per second up. Within three or four years it will be 10 gigabits per second down, five gigabits per second up, and then it will probably multiply by four again. So at some point in time we will obviously introduce that new capability and, at another point in time, we may find that, if demand increases, we will go and retrofit the equipment.[87]

5.84 Importantly, such upgrades to the fibre network will be demand driven, rather than applied ubiquitously over the entire network.[88]

5.85 In the rollout of the fixed wireless network, a core expectation of the NBN Co, as provided in the Government's Statement of Expectations, is that it will monitor technological advances across fixed wireless platforms in order to upgrade its products.[89]

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84 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 59.

85 NBN Co, *Submission 15.1* Answer to Question on Notice No. 11, p. 1.

86 NBN Co, *Submission 15.1* Answer to Question on Notice No. 11, p. 1.

87 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 59.

88 Mr Quigley, NBN Co, Transcript of Evidence, Sydney, 16 April 2012, p. 59.

89 Shareholder Ministers, 'Performance Report to 31 December 2011' *Submission 12,* p. 9.

5.86 A similar approach to upgrading the satellite service is likely to be pursued. The Performance Report stated:

> Over time, it is expected that further services will be supported [on the Satellite Access Service] as NBN Co upgrades its networks and through other technological improvements.[90]

Extending the Fibre Footprint

5.87 In its First and Second Reviews, the committee reported on the applications by private entities, individuals, and local and state governments to extend the fibre footprint to communities and premises that are expected to receive services via the fixed wireless or satellite infrastructure. This remains an issue.

5.88 Such concerns were raised by the Regional Development Australia – Northern Inland NSW which stated:

> ... for some communities it would be a backward step to go from ADSL2 to a wireless service. There are a number of examples in our region [that] do not reach the threshold to receive fibre. There is an argument that that particular population threshold could be relaxed such that homes and businesses that already have an ADSL connection through copper should be receiving a fibre service otherwise they risk taking a backward step.[91]

5.89 Other participants in the committee's inquiry, including the Berrigan Shire Council, the Redland City Council and Tatachilla Lutheran College, voiced similar concerns.[92]

5.90 The issue of extending the fibre footprint exposes the general community concern about the difference in quality between the services available on the fibre network to those available on the fixed wireless or the satellite services. For example, the Berrigan Shire stated:

> We are particularly concerned to make sure that we do not again fall behind the rest of rural Australia in particular by not having access probably to the top level of connection under the NBN. [93]

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90 Australian Government, February 2012, *Response to the Joint Committee on the National Broadband Network First Report on 31 August 2011*, p. 26.

91 Mr Nathan Axelsson, Executive Officer, Regional Development Australia Northern Inland NSW, Transcript of Evidence, Sydney, 16 April 2012, p. 18.

92 Mr Hansen, Berrigan Shire Council, Transcript of Evidence, Sydney, 16 April 2012, p. 22; Mayor of Redland City Council, *Submission 7*; Mr Paul Andrejic, Business Manager, Tatachilla Lutheran College, Transcript of Evidence, Willunga, 30 April 2012, pp 15-18.

5.91 Responding to the committee's recommendation in its Second Report calling for the formalisation and publication of the policy for extending the fibre footprint, on 1 February 2012 the NBN Co released the 'Network Extension Quote Method for the Tasmanian Trial'.[94]

5.92 The interim policy details the methodology of the NBN Co when developing quotes to extend the fibre network during the Network Extension trial in Tasmania. The trial will be for selected properties that bordered sites of Triabunna, Sorrell, Deloraine, St Helens and South Hobart in Tasmania.[95]

5.93 The Ministers also affirmed that the NBN Co's Network Planning and Design team will undertake studies to identify the incremental cost per premises to provide fibre.[96] However, as NBN Co has stressed previously, and restated by the Shareholder Ministers:

> ... preparing these costings around individual propositions is a significant diversion of resources. Therefore, NBN Co is only intending to do costings for locations contiguous with the rollout and when an application under a properly defined process is received. The network extension process needs to be scheduled to fit within the overall construction timetable for an area, preferably around the finalisation of network design documentation, so that the overall costs of network extension on both end-users and the company are minimised and the process is able to be accommodated in an efficient and effective manner.[97]

5.94 The outcomes of the network extension trials were not clear at the time of writing.

Concluding Comments

Fibre and Regional Australia

5.95 The committee commends the energy and enthusiasm of regional communities for seizing the opportunities and confronting the challenges

93 Mr Hansen, Berrigan Shire Council, Transcript of Evidence, Sydney, 16 April 2012, p. 22.

94 NBN Co, 'Network Extension Quote Method for Tasmanian Trial', <www.nbnco.com.au >, viewed 7 May 2012.

95 Australian Government, April 2012, *Response to the Joint Committee on the National Broadband Network Second Report on 24 November 2011*, p. 6.

96 Australian Government, April 2012, *Response to the Joint Committee on the National Broadband Network Second Report on 24 November 2011*, p. 6.

97 Australian Government, April 2012, *Response to the Joint Committee on the National Broadband Network Second Report on 24 November 2011*, p. 6.

that high-speed broadband will create. Local governments, businesses, schools and residents are at the forefront of setting the direction, and scoping the parameters of e-governance, e-education, and e-commerce in Australia for the future.

5.96 As the national discussion progresses to how the NBN will transform Australia's digital economy, and precisely what activities the infrastructure will support, it is imperative that those communities that are setting the parameters and scoping the direction of what the NBN will bring, engage in greater connectivity with their counterparts both in Australia and around the world.

5.97 First release sites in particular, are at the forefront of defining what types of services, activities and applications the NBN will bring to individuals, families, businesses, local governments, schools and hospitals. These communities will set the example for later-connecting communities, and their successes, challenges and the lessons learned should be shared and communicated among the network of NBN-connected areas.

5.98 Consequently, it is important that councils and community organisations alike work collaboratively and establish mechanisms for the exchange of ideas that will assist them to be e-ready once they become connected to the network. The committee notes the role that the Australian Local Government Association could play in this regard, and the national leadership required of the Government.

Connection Difficulties

5.99 It is concerning that consumers are experiencing problems with retail service providers such as connection activation delays and dropouts. As the rollout progresses, the volume of customers – whose relationship is with RSPs, not with the NBN Co – will significantly increase, placing greater consumer expectations upon those providing services. However, the committee expects that as RSPs become more familiar with the infrastructure and the types of consumer support that is required, the consumer experience will also improve.

Fixed Wireless Services

5.100 Within the WAS footprint, user-mobility has been compromised for the guarantee of consistent speed within the wireless cell. Yet the NBN Co and industry see the absence of mobility throughout the fixed line network as being complementary to industry-operated mobile wireless services.

5.101 Community clarification of the distinction between fixed wireless and mobile wireless networks is particularly important as the rollout of the

WAS progresses from design and build, to a phase where consumers are beginning to seek services from RSPs.

Terminology

5.102 The committee notes possible expectations in the community that the fixed wireless and satellite services will support certain activities, such as mobile roaming. It is important that all communities in the WAS and SAS footprints are aware that basic telephony services and mobile telephony will continue on current infrastructure, or alternatively, a service provider might offer VOIP services.

5.103 Providing this clarity to residents and businesses in these areas is particularly important in light of the extensive public education initiatives for communities in the fibre footprint that will focus on the positive steps all consumers will need to take in this regard.

Reliability of Satellite Signals

5.104 While climate was a consideration for the site selection of the ground station satellite, there are still questions surrounding the penetrability, and hence reliability, of the SAS. This raises concerns about the quality of SAS operability into the future, which may have a negative impact on the NBN satellite network. The committee will continue to monitor this issue.

Take Up of the Interim Satellite Service

5.105 It is concerning that in the last reporting period, the take up rate of the ISS is less than 1.5 per cent of premises available for services. This may indicate either a delay in installations to those end-users seeking services, or low-levels of public awareness of the service. A third possibility is that residents and businesses eligible for the ISS do not believe the service is appropriate for their needs, budgets or daily activities.

Telephony, Broadband and Black Spots

5.106 The committee asked the DBCDE if the NBN infrastructure could be reconfigured to allow improvements in mobile telephony services. In its response the DBCDE did not answer this question.[98] Rather, the DBCDE referred the committee to satellite mobile phones as 'an alternate means to accessing mobile communications' and stated that the Government's Satellite Phone Subsidy Scheme exists to improve the affordability of these handsets.[99]

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98 DBCDE, *Submission 3.1*, Answer to Question on Notice No. 12, pp 1-2.

99 DBCDE, *Submission 3.1*, Answer to Question on Notice No. 12, pp 1-2.

5.107 The lack of clarity surrounding the role of the NBN in supporting telephony, particularly mobile telephony, may lead to unfounded expectations within the community. Given that telephony in many regional and remote areas of Australia is still inferior to what is available in urban centres, this is entirely understandable.

Maintenance Works

5.108 The security of the network was discussed in Chapter 4. However, it is important to note the role that maintenance plays in providing a secure environment for end-users.

5.109 Whether the Australian workforce has the skills set to be able to carry out maintenance works is an issue that the committee will look to examine in its next review.

Extending the Fibre Footprint

5.110 Concerns about the extension of the fibre footprint suggests reticence on part of the community that a logical and equitable approach is taken by the NBN Co when deciding which communities are deemed to receive fibre and those that will receive fixed wireless or satellite services.

5.111 In its Second Report, the committee recommended that the NBN Co formalise and publicise its policy for the provision of costing extensions to the fibre footprint for the communities falling within WAS and SAS areas. The NBN Co has issued what appears to be an interim policy for Tasmanian communities seeking an extension of the fibre footprint.

5.112 Given the size and complexity associated with such applications, a trial of this system and policy has merit. However, this policy must be formalised and also made available to communities on mainland Australia. Importantly, as the fixed wireless and satellite services are progressing to a construction phase, these communities seeking an extension to the fibre footprint will be placed under a significant time restraint.

5.113 Although the NBN Co's approach may be a logical and resource efficient, the point at which the NBN Co consults with communities is at the final stage of the development of network design, leaving little time for communities to develop such applications. Many individuals or businesses learn of the decision upon the NBN Co's announcement – a point at which a decision appears to be final and not open to further negotiation despite what has been stated by the Shareholder Ministers.

Recommendation 9

5.114 **The committee recommends that the NBN Co revise its terminology and language to clarify community understanding of what the three National Broadband Network services can and cannot support, to enable the community to prepare for the network's services appropriately and become fully informed.**

Recommendation 10

5.115 **The committee recommends that the NBN Co include in its web-based interactive rollout map specific information on the provision of voice services for communities in fixed wireless and satellite access areas.**

Recommendation 11

5.116 **The committee recommends that the NBN Co finalise its policy for the provision of costing extensions to its planned National Broadband Network fibre footprint:**

- **And publicise the policy and its process for communities in the fixed wireless and satellite service areas; and**
- **At the point of announcing new areas within these footprints, ensure that the policy is attached to media releases and known to the relevant local government associations.**