



Joint Standing Committee on the National Broadband Network

The rollout of the NBN in rural and regional areas

2nd Report of the 45th Parliament

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Mr Josh Wilson, MP, Deputy Chair (from 10.10.2016 to 10.05.2018 and from 12.09.2018)	ALP, WA
Mr Brian Mitchell, MP (Deputy Chair from 10.05.2018 to 12.09.2018)	ALP, TAS
Ms Gai Brodtmann, MP	ALP, ACT
Senator Peter Georgiou (from 18.06.2018)	PHON, WA
Hon Dr David Gillespie, MP (from 12.09.2018)	NATS, NSW
Senator Stirling Griff	CA, SA
Mr Luke Howarth, MP	LNP, QLD
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Senator Chris Ketter	ALP, QLD
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Senator Deborah O'Neill	ALP, NSW
Senator Dean Smith	LP, WA
Senator Jordon Steele-John (from 7.12.2017)	AG, WA
Senator Anne Urquhart	ALP, TAS
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Senator Pauline Hanson (from 11.10.2016 to 18.06.2018)	PHON, QLD
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List of recommendations

Recommendation 1

4.10 The committee recommends that nbn materially expand its 'Layer 3' capabilities to better utilise satellite capacity and improve the customer experience.

Recommendation 2

4.11 The committee recommends nbn use expanded 'Layer 3' capabilities to deliver a significant increase to monthly data allowances for households and businesses on Sky Muster satellite in conjunction with prudent traffic management during peak periods.

Recommendation 3

4.12 The committee recommends nbn work proactively with retail service providers to promote the take-up of Sky Muster services in areas where no alternative connectivity options exist.

Recommendation 4

4.14 The committee recommends nbn release the Sky Muster Business Enterprise Plan as a matter of urgency.

Recommendation 5

4.16 The Government should provide the committee with data around how many premises which previously or currently have an ADSL connection fall into the Sky Muster footprint, so the committee can assess concerns raised about the future arrangements for ADSL services.

Recommendation 6

4.19 The committee recommends nbn, in light of increasing congestion over its fixed-wireless network, consider moving away from replicating wholesale fixed-line product tiers on fixed-wireless if that is shown to deliver sub-optimal outcomes for consumers. In considering this, nbn could review the structure of its fixed-wireless wholesale offerings with the aim to optimise spectrum use towards delivering the best possible consumer experience.

Recommendation 7

4.20 The committee recommends that nbn examine the merits of expanding its 'Layer 3' capabilities to better utilise fixed wireless capacity and improve customer experience during peak hours.

Recommendation 8

4.24 The committee recommends that non-NBN carriers explore opportunities with nbn, where applicable and technically feasible, to provide cost effective access to existing fibre backhaul with the aim to reduce current and future congestion on fixed-wireless cells.

Recommendation 9

4.28 The committee recommends that nbn include as part of its Monthly Progress Reports on its website reporting on the number of cells in the fixed wireless network which do not meet the six megabit per second metric.

Recommendation 10

4.29 The committee recommends nbn provide retail service providers with clear information on congested locations together with advice on the proposed remedial program.

Recommendation 11

4.30 The committee recommends that nbn in consultation with RSPs, develops a policy to govern the addition of new customer sign-ups on highly congested fixed wireless cells.

Recommendation 12

4.32 The committee recommends that the Government ensures that regional Australians are not disadvantaged by the auction of the 3.6Ghz spectrum currently used by WISPs and that alternate, equivalent spectrum is identified for these services.

Recommendation 13

4.35 nbn should provide consumers mapped for satellite services with better information about options for moving to fixed wireless where an adequate signal exists.

Recommendation 14

4.36 The committee recommends that nbn undertakes an assessment of those premises mapped for satellite that are adjacent to fixed wireless services and reports on how many premises allocated to satellite are capable of receiving a fixed wireless service at a level that meets the Statement of Expectations.

Recommendation 15

4.39 The committee recommends that nbn works with the Northern Territory Government and Telstra to investigate how existing optic fibre can be used to expand the fixed line and fixed wireless footprint in the Northern Territory and other relevant areas.

Recommendation 16

4.41 The committee recommends that the government and ACCC should examine the feasibility of undertaking an audit into fibre infrastructure across Australia and making the geospatial data publicly available where it does not compromise national security or other legitimate interests.

Recommendation 17

4.44 The committee recommends nbn, particularly through nbn local, engage more closely with rural and regional communities to explain the selection of technology to ensure communities have a greater visibility of nbn's decision processes and in relevant areas of the satellite footprint, explain to customers how to check for potential access to fixed wireless.

Recommendation 18

4.45 The committee recommends that nbn should make geospatial data for each technology footprint publicly available on the national map.gov.au website.

Recommendation 19

4.51 The committee recommends the Government update its RBS levy modelling to account for the cost increases that have occurred since the original modelling was undertaken in 2015. The Government should report to the committee within two weeks of the tabling of this Report to advise what the updated levy amount is.

Recommendation 20

4.52 Following the provision of updated modelling, the committee recommends that the Parliament pass the Telecommunications Legislation Amendment (Competition and Consumer) Bill 2018, and amend the Telecommunications (Regional Broadband Scheme) Charge Bill 2018 in recognition that the RBS levy does not constitute a sustainable funding mechanism, and is better re-purposed as a level playing field competition measure.

Chapter 1

Introduction

Establishment of the Committee

1.1 The Joint Standing Committee on the National Broadband Network (the committee) was established on 14 September 2016, pursuant to the agreement of the House of Representatives and the Senate, to inquire into and report on the rollout of the National Broadband Network (NBN).

1.2 The committee's establishing resolutions require the committee to report annually to each House of the Parliament until the NBN is declared built and fully operational on:

- (a) rollout progress with particular regard to the NBN Co Limited Statement of Expectations issued by Shareholder Ministers on 24 August 2016;
- (b) utilisation of the national broadband network in connected localities in both metropolitan and regional areas, and the identification of opportunities to enhance economic and social benefits;
- (c) Australia's comparative global position with regard to residential broadband infrastructure; particularly relative to other large, developed economies;
- (d) national broadband network activation rates, user demand, usage patterns and trends, and any identified impediments to the take-up of national broadband network services;
- (e) any market, industry, or regulatory characteristics that may impede the efficient and cost-effective rollout of the national broadband network; and
- (f) any other matter pertaining to the national broadband network rollout that the committee considers relevant.

Previous work of the committee leading to the first report

1.3 Throughout 2017, the committee conducted 15 public hearings and received 191 submissions. The committee received a significant volume of evidence detailing personal circumstances in relation to issues in connecting to the NBN. On 29 September 2017, the committee tabled a comprehensive report examining the rollout of the NBN.¹

1.4 A government response to the committee's report was tabled on 16 January 2018.

1 Joint Standing Committee on the National Broadband Network (JSC NBN), *The rollout of the National Broadband Network: 1st Report of the 45th Parliament*, September 2017, https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/NBN/First_report (accessed 3 July 2018).

Referral of inquiry

1.5 In late 2017, the committee agreed to conduct an inquiry into the rollout of the NBN in rural and regional areas:

Pursuant to paragraph 2(f) of the committee's resolution of establishment, the committee will inquire into the rollout of the National Broadband Network (NBN) in rural and regional areas, specifically focussed on the capacity and reliability of the satellite, fixed wireless and fixed line networks, in particular the:

- a. planning, mapping and eligibility for satellite, fixed wireless and fixed line services;
- b. adequacy of plans and service reliability of satellite, fixed wireless and fixed line services;
- c. issues in relation to the future capacity of satellite, fixed wireless and fixed line services;
- d. provision of service by alternative providers of satellite, fixed wireless and fixed line services; and
- e. any other related matters.²

1.6 The committee noted its intention to 'focus on the broader policy aspects of the rollout of the NBN in rural and regional areas'.³

1.7 Concurrently, the committee also established a separate inquiry into the business case for the National Broadband Network.⁴ The committee intends to report on this inquiry at a later date.

Conduct of the inquiry

1.8 Details of the inquiry were placed on the committee's website. Where appropriate, the committee agreed to seek submissions and hear from witnesses in relation to both of the inquiries. The committee wrote to individuals and organisations, inviting submissions by 29 March 2018. The committee continued to accept submissions after this date.

1.9 The committee received 22 submissions to its inquiry from a range of individuals and organisations. A list of the submissions received by the committee is available at Appendix 1. Other documents authorised for publication, including answers to questions taken on notice, are listed at Appendix 2.

2 JSC NBN, 'Inquiry into the rollout of the NBN in rural and regional areas', https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/Ruralandregionalrollout (accessed 3 July 2018).

3 JSC NBN, 'Inquiry into the rollout of the NBN in rural and regional areas', https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/Ruralandregionalrollout (accessed 3 July 2018).

4 JSC NBN, 'Inquiry into the business case for the National Broadband Network', https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/Businesscase (accessed 3 July 2018).

1.10 The committee held four public hearings—Sydney (4 June 2018); Melbourne (5 June 2018); Brisbane (14 June 2018); and Canberra (15 August 2018). A list of witnesses who appeared at the hearings is at Appendix 3.

Acknowledgements

1.11 The committee thanks the individuals and organisations who contributed to the inquiry.

Note on terminology

1.12 The company named nbn co limited was established in 2009 to design, build and operate Australia's new high-speed broadband network. References to the company name throughout the report will be abbreviated to the lower case nbn. Quotations and other sources that use variations of the company name will remain in their original form.

1.13 The acronym NBN will be used throughout the report when referring to the National Broadband Network.

References to Hansard

1.14 Some of the references in this report are to *Proof Hansard* transcripts. Page numbers may vary between the proof and the official *Hansard* transcript.

Migration to nbn

1.15 The NBN is an open access, national wholesale telecommunications network. The NBN is to replace existing copper networks and some HFC (Hybrid Fibre Co-Axial) networks, which will progressively shut down as the NBN fixed line network is rolled out. Homes and businesses using these copper and HFC legacy networks in NBN fixed line rollout will migrate to the NBN access network (or another network) to maintain landline phone and internet services.⁵

1.16 Telstra is required to disconnect services on its local (copper) access network in fixed line areas.⁶ Services affected are landline services provided over Telstra's copper phone lines, as well as all ADSL services and internet services from all providers. However, the copper network within the NBN's fixed wireless and Sky Muster Satellite areas will not be switched off. Premises within these areas can choose to maintain their existing services over the copper network.⁷

5 Department of Communications and the Arts, *Migration Assurance Policy Statement, Summary*, February 2016, p. 2, available at: <https://www.communications.gov.au/publications/migration-assurance-policy-statement-framework> (accessed 6 July 2018).

6 Department of Communications and the Arts, *Migration Assurance Policy Statement, Summary*, February 2016, p. 2, available at: <https://www.communications.gov.au/publications/migration-assurance-policy-statement-framework> (accessed 6 July 2018).

7 NBN Co, *Telecommunications policies—Migration Assurance Policy*, available at: <https://nbnco.com.au/corporate-information-about-nbn-co/policies.telecommunications-policies.html> (accessed 6 July 2018).

Regulatory framework

1.17 The regulatory framework for the NBN is set out more fully in the First Report of the Joint Standing Committee on the National Broadband Network: The rollout of the National Broadband Network.⁸ Briefly, the *National Broadband Network Companies Act 2011* (NBN Companies Act) and the *Telecommunications Legislation Amendment (National Broadband Network Measures—Access Arrangements) Act 2011* (NBN Access Act) provide the overarching legislative framework. The legislation is additional to the existing generic telecommunications regulatory framework.

1.18 This legislation allows for the company structure and ownership, competitive access arrangements, industry codes and standards. The NBN Companies Act provides that the Australian Government will retain full ownership of the NBN until the rollout of the network is complete.⁹

1.19 The regulatory regime permits the Shareholder Ministers of nbn, the Minister for Communications and the Minister for Finance, to issue a Statement of Expectations (SoE) as a means of providing greater clarity about government policies and objectives relevant to a statutory body. The SoE includes the policies and priorities a statutory authority is expected to observe in conducting its operations.¹⁰

Statement of Expectations

1.20 The current SoE, issued on 24 August 2016, sets out the Government's broadband policy objectives:

The Government is committed to completing the network and ensuring that all Australians have access to very fast broadband as soon as possible, at affordable prices, and at least cost to taxpayers. The Government expects the network will provide peak wholesale download data rates (and proportionate upload rates) of at least 25 megabits per second to all premises, and at least 50 megabits per second to 90 per cent of fixed line premises as soon as possible. nbn should ensure that its wholesale services enable retail service providers to supply services that meet the needs of end users.¹¹

8 JSC NBN, *The rollout of the National Broadband Network: 1st Report of the 45th Parliament*, September 2017, p. 3, available at https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Broadband_Network/NBN/First_report (accessed 3 July 2018).

9 Matthew L. James, *National Broadband Network (NBN), The broadband system*, Budget Review 2013–14 Index, available at: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201314/NBN (accessed 5 July 2018).

10 The Treasury, *Accountability and Reporting*, available at: <https://treasury.gov.au/the-department/accountability-reporting/statements-of-expectations/> (accessed 4 July 2018).

11 NBN Co Ltd, *Statement of Expectations, 24 August 2016*, p. 1, available at: <https://www.communications.gov.au/publications/nbnstatementofexpectations> (accessed 3 July 2018).

1.21 The SoE emphasised the use of multi-technology mix (MTM) to ensure the rollout is cost-effective:

To achieve these objectives nbn should roll out a multi-technology mix network and build the network in a cost effective way using the technology best matched to each area of Australia. nbn will ensure upgrade paths are available as required.¹²

1.22 The SoE noted:

This statement provides nbn with flexibility and discretion in operational technology and network design decisions within the constraints of the Equity Funding Agreement with the Commonwealth, and the Government's broadband policy objectives.¹³

Statutory Infrastructure Provider

1.23 Legislation before the current Parliament provides for a Statutory Infrastructure Provider (SIP) regime which will impose obligations on SIPs to ensure that all Australian premises are able to access superfast broadband services (25 Mbps or better), and makes nbn the default SIP for all of Australia.¹⁴

1.24 There will be a requirement upon nbn to connect premises and supply wholesale broadband services on reasonable request. nbn will become the SIP for areas as it rolls out its network and it will be the default SIP for all of Australia after the NBN is declared built and fully operational. Other network providers can also be SIPs where appropriate, for example where they have contracts to service premises in a new real estate development. SIPs will have to offer a standard broadband service with peak speeds of at least 25 Mbps download and 5 Mbps upload. On fixed line and fixed wireless networks, SIPs' standard services will also have to support voice services for consumers. The Australian Communications and Media Authority (ACMA) will monitor and enforce the SIP arrangements.¹⁵

The Universal Service Obligation

1.25 The Universal Service Obligation (USO) is a long standing consumer protection ensuring that everyone in Australia has access to landline telephones and

12 NBN Co Ltd, *Statement of Expectations, 24 August 2016*, p. 1, available at: <https://www.communications.gov.au/publications/nbnstatementofexpectations> (accessed 3 July 2018).

13 NBN Co Ltd, *Statement of Expectations, 24 August 2016*, p. 1, available at: <https://www.communications.gov.au/publications/nbnstatementofexpectations> (accessed 3 July 2018).

14 Telecommunications Legislation Amendment (Competition and Consumer) Bill 2018, Revised Explanatory Memorandum, p. 8, available at: https://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bId=s1131

15 Department of Communications and the Arts, *Telecommunication Reform Package*, <https://www.communications.gov.au/what-we-do/internet/telecommunication-reform-package> (accessed 5 July 2018).

payphones regardless of where they live or work. It is an aspect of the current wider telecommunications industry regulatory regime. Telstra is responsible for delivery the USO.¹⁶ The obligation on Telstra is both a legislative and contractual obligation, and is administered by the Department of Communications and the Arts.¹⁷

1.26 The USO provides a number of features, the more significant being:

- (a) access to local, national and international calls;
- (b) unlimited local calls;
- (c) 24 hour access to emergency service numbers;
- (d) call line identification, and
- (e) operator and directory assistance.¹⁸

1.27 The USO is complemented by the Customer Service Guarantee (CSG), which requires carriage service providers (CSPs) to meet performance standards, for example connection and repair timeframes, and provide end-users with financial compensation when these standards are not met.¹⁹

1.28 In areas where the NBN has not yet been rolled out, Telstra generally uses its copper network to meet the USO but may also use other technologies. As Telstra will stop using its copper network after the NBN becomes available in fixed line areas, it is expected Telstra will generally use the NBN to meet the USO in these areas.²⁰

Universal Service Guarantee

1.29 The USO managed by Telstra applies to landlines and payphones, that is, voice services only. On 20 December 2017, the government announced a program of work to implement a new Universal Service Guarantee (USG), so that all Australians will have access to voice and broadband services, regardless of where they live.

1.30 As part of the development of the new USG, voice telephony services will continue to be met by Telstra under the existing USO until this is replaced with a USG

16 Department of Communications and the Arts, *Universal Service Obligation*, available at: <https://www.communications.gov.au/what-we-do/phone-services/universal-service-obligation> (accessed 4 July 2018).

17 Department of Communications and the Arts, *Universal Service Obligation*, available at: <https://www.communications.gov.au/what-we-do/phone-services/universal-service-obligation> (accessed 4 July 2018).

18 Telstra, *Consumer Advice, Universal Service Obligation*, available at: <https://www.telstra.com.au/consumer-advice/customer-service/universal-service-obligation> (accessed 4 July 2018).

19 Department of Communications and the Arts, *Regulatory Impact Statement: Introduction of a Statutory Infrastructure Provider Regime into the Telecommunications Act 1997*, November 2016, p. 3.

20 Department of Communications and the Arts, *Regulatory Impact Statement: Introduction of a Statutory Infrastructure Provider Regime into the Telecommunications Act 1997*, November 2016, p. 3.

following the completion of the NBN rollout in 2020. In announcing the USG, the Minister for Communications, Senator the Hon Mitch Fifield, said:

The Government is taking a 'belt and braces' approach to protecting telecommunications accessibility for people in regional Australia... The Government is putting new, stronger safeguards in place before making any changes to existing safeguards while the NBN is rolled out.²¹

1.31 The USG will ensure areas with specific needs have access to payphones or equivalent community voice services, like communities with no mobile phone coverage or in remote Australia. It will leverage the significant investment in the NBN, access to which will be underpinned by the SIP legislation. The Copper Continuity Obligation (CCO) is a key provision of the USO contract between Telstra and the Commonwealth which prevents Telstra from disconnecting copper from premises outside of the National Broadband Network (NBN) fixed line footprint, except in a limited number of circumstances. The USO will continue to operate in tandem with NBN satellite services until the Government is satisfied that premises in rural and remote areas have access to alternative reliable and affordable voice services. The copper continuity obligation is a critical safeguard for those premises in the Satellite and Fixed Wireless footprints.

1.32 Significant issues affecting regional, rural and remote areas in the development of the USG include:

- alternative means of providing voice services to premises in nbn's satellite footprint, recognising that nbn satellites are designed for broadband and not voice services; and
- where and when it may be appropriate for Telstra to reduce the number of payphones provided under the USO.²²

Structure of the report

1.33 Chapter 1 is an introductory chapter which outlines the context and administrative details of the inquiry. The remainder of the report is structured as follows:

- Chapter 2 examines the progress of the rollout of the NBN in rural and regional Australia.
- Chapter 3 explores specific issues in relation to the technology used for the rollout in rural and regional Australia.

21 Senator the Hon Mitch Fifield, Minister for Communications and Minister for the Arts, *Turnbull Government to improve regional telecoms delivery with new Universal Service Guarantee*, Media Release, 20 December 2017, available at: <https://www.minister.communications.gov.au/minister/Mitch-Fifield?page=8> (accessed 5 July 2018).

22 Department of Communications and the Arts, *Universal Service Guarantee for telecommunications*, <https://www.communications.gov.au/what-we-do/phone/phone-services/universal-service-guarantee-telecommunications> (accessed 5 July 2018).

- Chapter 4 sets out the committee's conclusions and recommendations.

Chapter 2

Progress of the rollout of the NBN in rural and regional Australia

Introduction

2.1 This chapter sets out the importance of broadband services for rural and regional consumers, outlines the current state of the rollout of the NBN in the rural and regional areas and details the evidence received by the committee on the performance of the network in those areas. The chapter concludes with a discussion on how the NBN is addressing the digital divide and sets out the key challenges in rolling out the network in rural and regional areas.

Importance of digital connectivity for rural and regional Australians

2.2 Submissions highlighted the importance of digital connectivity for rural and regional users. In its submission the Western Australian (WA) Government considered digital connectivity to be the biggest challenge facing regional communities. The WA Government outlined its unique circumstances as the largest Australian state, covering the entire western third of the continent:

While the majority of its population resides in Perth, most of the major economic drivers are based in the regions, including key export industries in mining and agriculture: The agriculture and food sector is Western Australia's second major export industry producing more grain than any other state in Australia...It is important for the Commonwealth Government to consider a 'production value' scale when prioritising NBN Co's infrastructure in the rural and regional areas of Western Australia and that it not just be based on population density.¹

2.3 The WA Government contended:

Western Australian farmers are embracing technology advances to improve efficiencies. However, they are finding it increasingly difficult to contend in a global marketplace without connectivity comparable to that of their international competitors.²

2.4 The Queensland Government indicated that it is seeking to improve digital connectivity for Queensland. At the hearing, Mr Andrew Spina, Assistant Director-General, Digital Capability, Information and Transaction Based Services, Queensland Department of Housing referred to the high percentage of regional and rural households within Queensland, 37.6 per cent, compared to around 25 per cent in New South Wales and 29 per cent across the whole of Australia. Mr Spina noted Queensland's 'unfortunate position' of being identified as the most disaster-prone state in Australia, particularly over the last decade:

1 Western Australian Government, *Submission 20*, p. 2.

2 Western Australian Government, *Submission 20*, p. 2.

The connectivity, reliability and affordability of telecommunications and digital infrastructure, however, are critical to the growth and competitiveness of our local economies, job creation and the growth of new industries. They are also critical to providing equity of access for connecting people in communities, improving livelihood and lifestyle and providing access to online government services.³

2.5 Mr Spina advised the committee that connectivity, reliability and affordability of telecommunications and digital infrastructure are critical to Queensland's economy, as well as being critical to providing equity of access for connecting people in communities:

The 2017 Australian Digital Inclusion Index report ranks Queensland fifth for access across all states and territories and fifth for affordability, with our most digitally excluded Queenslanders being elderly people, Aboriginal and Torres Strait Islander communities, rural and low-income people and people with a disability.⁴

2.6 Ms Kathleen Robinson, Chief Executive, Department of Corporate and Information Services, Northern Territory (NT) Government put forward a similar view noting that the improvement in telecommunications is imperative, observing that it struggles to provide services to small population centres that are widely dispersed and often difficult to reach:

Improved telecommunications services in remote communities are a critical foundation for digital inclusion, enabling residents to achieve and engage with online education, health and financial services, along with many other [services].⁵

2.7 New South Wales Farmers' Association (NSW Farmers) stated that there is enormous latent demand for data in rural, regional and remote Australia, especially farm enterprises. The NSW Farmers emphasised that access to a reliable and competitive broadband network is essential for the Australian economy and society:

This is especially the case in regional, rural and remote Australia where...access will be essential to overcome the tyranny of distance and provide unparalleled opportunities. Such steps are vital to drive the projected growth of the agriculture sector to \$100 billion by 2030.⁶

2.8 Mr Roy Pidgeon, Chief Information and Digital Officer, Central Queensland University, emphasised the importance of the NBN in providing connectivity for students at that institution:

We're the largest regional university and the most distributed university in Australia. We have over 30,000 students spread across 16 campuses and 10 study centres in Australia. But, importantly, 60 per cent of our students

3 *Committee Hansard*, 14 June 2018, p. 25.

4 *Committee Hansard*, 14 June 2018, p. 25.

5 *Committee Hansard*, 14 June 2018, pp. 30–31.

6 NSW Farmers, *Submission 15*, p. 7

study online only, so everything we do has to be digital and served up in a digital way. Our students are rural, remote and regional. They're often low socioeconomic and first-year university students. They're remote and isolated in many ways and also quite time poor, so we deliver a business model that really supports online education. NBN is an enabler for people to access that from their places of residence.⁷

Progress of the rollout in rural and regional Australia

2.9 The joint submission of the Department of Communications and the Arts (Communications) and the Department of Finance (Finance) advised the committee that the NBN rollout in regional areas is more advanced than in the metropolitan areas, with 90 per cent of premises outside major urban areas either able to order NBN services or with NBN construction underway by mid-March 2018.⁸ The submission noted:

Today, NBN broadband services are available from Australia's northernmost islands in the Torres Strait to the southern research facilities on remote Macquarie Island; to the east as far as Norfolk Island - some 1600 kilometres from the mainland; and to the external Indian Ocean Territories of Christmas and Cocos (Keeling) islands. From remote Indigenous communities in central Australia, to distance education students from the School of the Air in Longreach, regional communities are using the NBN. For many, this is the first time they have been able to access fast broadband services at affordable prices.⁹

2.10 At the hearing on 14 June 2018, Mr Andrew Madsen, Assistant Secretary, Broadband Implementation Branch, Infrastructure and Consumer Division, Communications, told the committee that the rollout of the NBN is 'on track'.¹⁰ Mr Madsen stated that the rollout 'is over 80 per cent complete in regional areas—that is, areas outside major urban parts of Australia'.¹¹ Mr Richard Windeyer, Deputy Secretary, Infrastructure and Consumer Division, Communications, noted that the remaining 20 per cent of the rollout was spread across the non-metropolitan areas, and relatively evenly spread across the country.¹²

2.11 Mr Bill Morrow, CEO, nbn, said that currently more than 320 000 premises in regional and remote Australia are connected to fixed wireless or satellite with NBN

7 *Committee Hansard*, 14 June 2018, p. 62.

8 Department of Communications and the Arts, and the Department of Finance, *Submission 10*, Attachment B, p. 2.

9 Department of Communications and the Arts, and the Department of Finance, *Submission 10*, Attachment B, p. 1.

10 *Committee Hansard*, 14 June 2018, p. 34.

11 *Committee Hansard*, 14 June 2018, p. 34.

12 *Committee Hansard*, 14 June 2018, p. 34.

access now available to more than one million homes.¹³ Mr Morrow emphasised the technology mix:

I know that these technologies are of a particular interest to the committee, but let me just emphasise that regional Australia does not automatically imply fixed wireless or satellite to serve their broadband needs. About three-quarters of services in non-metro areas will actually be delivered by a fixed line, and the rollout of fixed line in regional areas is very well advanced.¹⁴

2.12 While the committee notes the evidence that fixed line connections make up the bulk of NBN services in rural, regional and remote Australia, the committee's evidence was predominantly focussed on fixed wireless and satellite services.

Performance of NBN services

2.13 The committee received evidence on how the network is performing in rural and regional areas. Witnesses emphasised improvements in services, and in nbn's engagement with stakeholders, over the previous 12 months. However, the committee also heard concerns regarding the cost and performance of services, the reliability of satellite services and congestion in the fixed wireless network.

Improvements in services, stakeholder engagement and public reporting

2.14 Submissions and witnesses highlighted developments in the past year which have improved the experience for rural and regional consumers. For example, Mrs Kristy Sparrow, Chief Administrator and Co-Founder, Better Internet for Regional, Rural and Remote Australia (BIRRR) acknowledged that recent changes introduced by nbn have been positive and welcomed by people in rural areas. These included a doubling of peak data limits for Sky Muster users and the launch of the nbn local team to improve customer experience.¹⁵

2.15 Several witnesses highlighted a positive experience for consumers brought about by improvements to the Sky Muster service over the last 12 months. Mr Tony Bundrock, Chairman, Australian Private Networks (APN), observed that the Sky Muster Fair Use Policy (FUP) had increased data limits by 50 per cent, leading to a significant reduction in complaints.¹⁶ The Australian Communications Consumer Action Network (ACCAN) was also supportive of the increase in data limitations over Sky Muster, saying the changes have brought the data allowances available for satellite in line with the average household use.¹⁷ At the public hearing in Sydney,

13 *Committee Hansard*, 4 June 2018, p. 41.

14 *Committee Hansard*, 4 June 2018, p. 41.

15 *Committee Hansard*, 4 June 2018, p. 69. See also Ms Kathleen Robinson, Chief Executive, Northern Territory Department of Corporate and Information Services, *Committee Hansard*, 14 June 2018, p. 30.

16 Mr Tony Bundrock, Chairman, Australian Private Network, *Submission 8*, p. 1.

17 ACCAN, *Submission 12*, p. 9; See also: Northern Territory Government, *Submission 1*, p. 3; Queensland Government, *Submission 13*, p. 8; BIRRR, *Submission 14*, p. 5.

Ms Teresa Corbin, Chief Executive Officer, ACCAN, acknowledged that nbn had made significant improvements to broadband services for regional, rural and remote Australia, noting in particular:

[W]e do contend that there have been some more positive reports about consumers using Sky Muster services—overall, that many of the teething problems have been addressed. That doesn't mean that there aren't ongoing issues with reliability...but we are aware that NBN is continuing to work on and address those issues.

We also want to say that plans and overall data allowances over Sky Muster are offered on a similar price to those in fixed and fixed-wireless footprints, and from October last year there was a significant increase in the peak and off-peak allowances, reflecting actual usage. These have been welcomed...¹⁸

2.16 Witnesses and submitters also indicated that nbn had engaged with stakeholders to improve communication and services. For example, the Queensland Government stated that it has a good working relationship with nbn which extended to regular meetings and the sharing of information:

The Queensland Government wishes to continue to work closely with nbn co in this way to ensure improved broadband digital connectivity is delivered to rural and regional Queensland.¹⁹

2.17 Mrs Sparrow also commented on nbn's engagement with BIRRR, including several meetings and a recent visit that Mrs Sparrow had undertaken to the nbn call centre on the Gold Coast.²⁰ Similarly, Ms Corbin of ACCAN acknowledged a significant improvement in that organisation's relationship with nbn:

I think I am on the record as saying last year that the relationship has significantly improved. There's engagement from the board and CEO right down to the staff who are actually delivering on the contracts. Last week we met with a team that are managing fixed-wireless and satellite services to clarify some of the issues with fixed wireless. We have a regular engagement with them, a standard meeting, as part of their NBN local engagement as well. So we have a roundtable for regional concerns. But as and when we need to consult with them about specific issues—because we're also members of the Product Development Forum—we will engage and ask NBN for specific meetings. Also, quite often, they'll contact us directly and initiate that as well. So it's quite detailed.²¹

18 *Committee Hansard*, 4 June 2018, p. 23.

19 Queensland Government, *Submission 13*, p. 5.

20 *Committee Hansard*, 4 June 2018, p. 69.

21 *Committee Hansard*, 4 June 2018, p. 25.

2.18 Several submissions and witnesses commended the introduction of the nbn local initiative.²² NSW Farmers stated it is in regular contact with nbn through nbn local. NSW Farmers stated:

We understand that complaints are reducing that nbn has taken steps to improve the manner and method by which the rollout is occurring.²³

2.19 ACCAN was also very supportive of nbn local:

This is likely to greatly assist consumers and overcome...issues and information gaps. 'Nbn local' should be fully supported and be available to all consumers, not just consumer groups. This includes advertising where the nbn Satellite "Sky Muster" truck will be so consumers can inform themselves and have an opportunity to ask nbn local representatives questions directly.²⁴

2.20 In March 2018, nbn announced the introduction of a Monthly Progress Report to track service and quality improvements to the NBN. The report tracks a range of performance measures, including, for example: right first time installations; meeting agreed installation times; average network bandwidth connections across the network (excluding Sky Muster); and meeting nbn's agreed fault restoration times. nbn's Chief Customer Officer-Residential, Mr Brad Whitcomb gave the undertaking:

We will continue to keep the Australian public abreast of the initiatives being undertaken to ensure continued improvement and commit to demonstrate our progress by making our results available to the public.²⁵

2.21 nbn has established a website dashboard which tracks each month's performance against identified measures, providing metrics and a commentary on progress. A separate more detailed report sits behind the dashboard, providing comparative monthly performance statistics since July 2017.²⁶ An example dashboard metric for July 2018 congestion performance states:

22 See for example: Northern Territory Government, *Submission 1*, p. 3; Mrs Kristy Sparrow, Chief Administrator and Co-Founder, BIRRR, *Committee Hansard*, 4 June 2018, p. 69; Mr Zachary Whale, Grains Policy Director, AgForce, *Committee Hansard*, 14 June 2018, p. 51.

23 NSW Farmers, *Submission 15*, p. 9.

24 ACCAN, *Submission 12*, p. 8.

25 NBN Co to publish customer experience progress report, media statement, 13 March 2018, available at: <https://www.nbnco.com.au/corporate-information/media-centre/media-statements/customer-experience-progress-report.html> (accessed 30 August 2018).

26 NBN Co: Dashboard: Australia, we've taken action: how we're tracking, July 2018, available at: <https://www2.nbnco.com.au/corporate-information/about-nbn-co/updates/dashboard-july.html> (accessed 30 August 2018).

Average bandwidth congestion across the nbn access network is around 28 minutes per week per premises (up slightly from 25 minutes in June 2018) – compared with 4 hours and 52 minutes per week in July 2017.²⁷

2.22 nbn has also launched an Information and Communications Technology (ICT) channel to provide technology consultants and vendors with access to critical information and support when assisting their clients to connect to the nbn access network. The ICT channel provides dedicated assistance to the ICT industry:

The launch of this new channel is a part of our commitment to improve the customer experience of businesses who connect to the nbn access network by collaborating with industry to improve processes around the connection, migration and delivery of service.²⁸

Affordability and reliability of satellite and fixed wireless services

2.23 A number of submissions outlined concerns that consumers outside the fixed line footprint were receiving a lower quality service, both in terms of affordability and reliability of the service.²⁹ Ms Sonia O’Keefe, Chair, Rural Affairs Committee, NSW Farmers, explained that for some farmers, their expectations in relation to the NBN had not been met:

...farmers had high expectations for the rollout of the National Broadband Network. For some, these expectations have been met. Farmers in regional communities are telling us that they are benefiting from the digital age and, for the first time, they are on a more level playing field. They are excited about opportunities now and tomorrow. Other members have a very different experience, ranging from feeling that the upgrade has not met expectations to total frustration and annoyance.

...

Households and businesses that are within the fibre footprint enjoy comparatively cheap fast broadband with not only unlimited downloads but also unlimited access. Remote customers whose only option is the NBN satellite are charged significantly higher costs for a slower, less reliable service that has restrictive on-and-off-peak access. Coupled with this is the inability of remote residences to have a choice of technology or to bundle telecommunication services with the one provider, thereby reducing confusion and costs.³⁰

27 NBN Co: Dashboard: Australia, we've taken action: how we're tracking, July 2018, available at: <https://www2.nbnco.com.au/corporate-information/about-nbn-co/updates/dashboard-july.html> (accessed 30 August 2018).

28 Mr Ben Salmon, Executive General Manger of Business Sales and Marketing to NBN Co: NBN Co targets industry with new ICT channel, media statement 12 April 2018, available at: <https://www.nbnco.com.au/content/dam/nbnco2/documents/NBN-Co-targets-industry-with-new-ICT-channel-Media-Release.pdf> (accessed 30 August 2018).

29 See for example: Mr Phillip Britt, Managing Director, Aussie Broadband, *Committee Hansard*, 5 June 2018, p. 31.

30 *Committee Hansard*, 4 June 2018, p. 13.

2.24 Ms O'Keefe emphasised that the reliability of the satellite was the biggest issue in relation to the service:

Your last witness talked about people streaming ultra high definition television. That's something that people in rural and remote areas haven't even heard of. We're definitely what he termed as lower end customers in this discussion. We're talking about people who want to be able to book an airline ticket in under 45 minutes. We're talking about people who want to be able to sit in front of their computer and access the internet 24 hours a day seven days a week, not just when the sun is shining or there doesn't happen to be an outage on that service.

In relation to the capacity of the data, the speeds vary. They're not always the speeds that we're informed that we are going to get—and that's right across all the NBN technologies. The amount of data that's being downloaded at the moment isn't the issue; it's having access, having that at an affordable price and having a substantial complaints-resolution process that isn't something that was developed six months ago—that there's a system in place that people know about.³¹

2.25 Mr Steve Turner, Owner, Coonabarabran Business Centre and Computer Hospital, expressed his concerns that satellite is being offered for areas of Coonabarabran that are currently served by fixed line ADSL. He considered this to be a retrograde step:

It is seemingly a step down from ADSL availability to satellite only for a number of areas in the town. Regardless of what anyone says, it is a step down, without a doubt. The satellite is worse value for money than any other kind of internet service, and it's a service that should have been reserved for only the very remote, not for areas within or near towns that already have fixed line services.³²

2.26 Mr Turner put forward his view that a fixed line service is always the most stable and the most reliable service, and that fixed wireless is better than satellite. Mr Turner argued that nbn's approach between urban and regional services was inequitable. Mr Turner described his 'quality NBN fixed line plan' in Coonabarabran, NSW, which costs \$99.95 a month for 100/40 fibre-to-the-node NBN with unlimited data, no shaping and a latency of 20–40 milliseconds (ms). On this plan, Mr Turner stated his family used an average of 600 gigabytes (GB) per month data download and up to a terabyte (1TB) in holiday times. In comparison, friends of Mr Turner, who live 3–5km away from him are on 'one of the best Sky Muster plans available'. The Sky Muster plan costs \$150 a month for a satellite service of 25/5 connection speed with 150GB peak data and 150GB 'off peak' data, with a latency of 600–700 ms.³³ In

31 *Committee Hansard*, 4 June 2018, p. 14.

32 *Committee Hansard*, 14 June 2018, p. 14. See also: Warrumbungle Shire Council, *Submission 9*, p. 3.

33 Mr Stephen Turner, Owner, Coonabarabran Business Centre and Computer Hospital, *Submission 5*, pp. 2–3. See also: BIRRR, *Submission 14*, p. 16; NSW Farmers, *Submission 15*, p. 12.

effect, the consumer on the Sky Muster service is having to pay 50 per cent more for less data and slower speeds than for a fixed line service.

2.27 BIRRR also commented on the impact of the Fair Use Policy (FUP):

This FUP has resulted in RRR residents (who do have access to mobile broadband) paying for two connections (Sky Muster and mobile broadband) to access their data needs. Those who have no access to mobile broadband have to manage their data use to fit within these restrictions. BIRRR has serious concerns that as data needs grow, RRR Sky Muster users will (once again) be left behind.³⁴

2.28 However, some witnesses did express satisfaction with the performance of satellite services. For example, Mr Tony Bundrock, Chairman, APN, when questioned on the overall experience of Sky Muster services, stated:

We have been happy, as you say, over the past 12 months with the performance. They're subject to particular outages and such, as I've mentioned, but otherwise we're pretty happy with the performance. It's a quite significant step up for satellite technology across Australia to the individual user. Having been in this game for a while, I can see there's been a quantitative shift in performance available to people for the price.³⁵

2.29 Similarly, Ms Georgie Somerset, Chair, AgForce Telecommunications Committee, AgForce, Queensland, (AgForce), while noting that she relies on a mobile broadband service, commented on the improved reliability of Sky Muster services:

...we believe Sky Muster has become much more reliable. I am reliant on Sky Muster in our business, and I have mobile broadband, but I need quite a bit of equipment to be able to access that. What we've observed and the feedback we have from members is that their reliability has also improved, but we still have members requiring increased data. So the recent increased data limits were a huge benefit, but we've got members who are certainly looking for the business-grade accounts and have been from the very beginning. However, the speed and the bandwidth has meant that we can access videoconferencing and cloud computing. It's more the actual amount of data that people can access.³⁶

2.30 Mrs Sparrow, BIRRR, noted that she was happy with her Sky Muster service, but alluded to the hesitation that others may have in moving to a satellite service:

Sky Muster is obviously an NBN service. It's the best internet service that I've ever had; however, that message doesn't seem to be getting out to the regions.³⁷

2.31 Mr Bill Morrow, CEO, nbn, stated that it had always been acknowledged that satellite services would not offer the same reliability as fixed line technology:

34 BIRRR, *Submission 14*, p. 16; see also, NSW Farmers, *Submission 15*, p. 12.

35 *Committee Hansard*, 5 June 2018, p. 49.

36 *Committee Hansard*, 14 June 2018, pp 52–53.

37 *Committee Hansard*, 4 June 2018, p. 69.

There is inherent physics that presents challenges to satellite based services. The frequency band which we use puts it up there in an area that is more susceptible to rain fade than what you see in other satellite solutions. With these sorts of things, all you can do is try to refine. It is not providing the same level of reliability and capacity that the fixed line technology does today within the city centres, but that was acknowledged and recognised right from the get-go.³⁸

2.32 In relation to fixed wireless services, witnesses and submitters also emphasised the increasing prevalence of congestion affecting these services. For example, Ms Isabella McDougall, Policy Adviser, NSW Farmers, commented:

Congestion is actually something that we've become much more aware about through our membership with ACCAN. Many customers are being placed on towers that are already holding too many customers on them, so, as a result, the amount of data that you are receiving is not what you've actually purchased and what you are meant to be retrieving from the retail service provider, because there are too many customers already on that tower.³⁹

2.33 Mr Phillip Britt, Managing Director, Aussie Broadband, highlighted the frustration of his customers in relation to congested services:

I'd like to firstly talk about the performance of the fixed wireless network. NBN stated late last year that they consider delivering six megabits per second during peak time as an acceptable level of congestion on a fixed wireless network, even if a customer is purchasing a 50-megabit service. The ACCC definition for fixed line would say that anything below 30 megabits per second would be unacceptable. This is a significant difference for regional uses. What our customers say about this I really can't repeat here.⁴⁰

2.34 Mr Britt continued:

We feel the six megabit is grossly under what it needs to be for regional users. If you're paying for a 50 megabit service, our graph that's in our submission there shows that on the customers we tested very rarely will you even get anything close to that and the vast majority of the time you'll be under 25 meg.⁴¹

2.35 Ms Una Lawrence, Director of Policy, ACCAN, informed the committee of the information that organisation had in relation to the location of congested towers:

...we've identified that the more populous areas are the areas where the towers are congested. It is along the eastern seaboard, in parts of Tasmania, and clusters around Perth and Darwin in particular.

38 *Committee Hansard*, 4 June 2018, p. 44.

39 *Committee Hansard*, 4 June 2018, p. 17.

40 *Committee Hansard*, 5 June 2018, p. 31.

41 *Committee Hansard*, 5 June 2018, p. 37.

...

We don't have specifics on which towers are congested. We are very interested to find out more data about that. What we are receiving are accounts from consumers about their frustrations and how, for example, people in Armidale, New South Wales, are very frustrated because at a peak times their service degenerates to such an extent that it is virtually unusable, but they've been told that there is not going to be an upgrade available until October.⁴²

2.36 Mr Morrow acknowledged that this is an issue that nbn are aware of and seeking to address:

We have been open about the recent congestion experience in a small number of cells and we have explained the rolling upgrades taking place to rectify this. For cells that have a higher degree of congestion we are actively engaging with RSPs to provide them with information so that end-users can be kept informed. RSPs get monthly upgrades schedules and a list of current congested areas so they can manage the expectations of their customers. We are also actively monitoring the end-user experience. We continue to actively look at our options to respond to demand. We are also looking at longer term plans for responding to congestion on the wireless network and are considering all available options.⁴³

2.37 The committee heard evidence from nbn that it was exploring options to charge retail service providers \$20 more per month for a fixed wireless 50 Mbps bundle than the equivalent fixed line bundle. This would have meant that regional customers would likely pay 44% more than someone in the city for the same 50 Mbps speed under this plan.

2.38 This evidence was of great concern to committee members as it would be contrary to the objective of lessening the digital divide in Australia through the nbn project. The committee notes that the Government subsequently took steps to rule out nbn's proposal once it had been made public through committee member's questioning and strong objections.

2.39 Aside from the issues in relation to the cost and reliability of satellite and fixed wireless services, the committee was also informed that one problem for remote users is that there is not an appropriate service for their needs. Mr Douglas Cooke, Senior Director, Digital Policy and Telecommunications, Northern Territory Department of Corporate and Information Services, advised the committee that the biggest problem for NT's remote communities are the products on offer:

The product of choice for our communities remains mobile services, primarily because of two factors: one is the fact that the services they take up are prepaid, and the other is the mobility. Neither of those are aspects of any RSP provided NBN service.⁴⁴

42 *Committee Hansard*, 4 June 2018, p. 27.

43 *Committee Hansard*, 4 June 2018, pp 41–42.

44 *Committee Hansard*, 14 June 2018, p. 31.

Addressing the digital divide

2.40 In its Annual Report 2017, nbn noted its purpose is to 'connect Australia and bridge the digital divide'.⁴⁵ When asked about the digital divide between metropolitan areas and rural and regional areas, Ms O'Keefe, NSW Farmers, said that there 'was a general feeling out there that there isn't going to be equality within the rural and regional areas'.⁴⁶

2.41 However, Ms Somerset, AgForce, provided a different perspective:

We believe we need to work with the technology we've got. I continue to hope that there will be another, even more affordable, technology developed by someone in the near future. On the digital divide, our members and regional Queensland are actually very switched on, in terms of being online.⁴⁷

2.42 Professor Reg Coutts provided his assessment on whether the digital divide was being addressed with the rollout of the NBN:

The digital divide has many dimensions, but if we're talking about the urban-rural divide aspects, which I think you're asking about, in some senses it's decreasing and in some senses it's increasing, because, once people have experienced broadband that is reliable, suddenly their expectations and what they want to do with it changes. So it's a changing feast. But I don't think Sky Muster in itself has actually decreased the digital divide; it will always be with us to a certain extent because some lower density populations are not going to have the advantages of the higher density populations in our cities. We're seeing this with 4G and we're seeing it with 5G. It's a universal problem—or, as I like to say, it all comes back to the laws of physics, where those laws weren't actually decided in any particular country jurisdiction.⁴⁸

2.43 Mr Morrow described the key challenge in delivering fixed line NBN services to rural and regional areas of Australia:

As you know, Australia's geography poses challenges that have troubled policymakers since the days of the overland telegraph. Now that broadband has become an essential service, the calls for equitable services across Australia have been growing...We have seen a massive improvement in services with the introduction of Sky Muster and NBN's fixed wireless service, which now offers speeds up to 50 times faster than the [Australian Broadband Guarantee] threshold [of 512 kilobits]. It is worth asking, though: what is it about these one million premises that requires the government to continually intervene? Why hasn't the market stepped in to

45 nbn co, *Annual Report 2017*, p. 4.

46 *Committee Hansard*, 4 June 2018, p. 21. See also Associate Professor Mark Gregory, RMIT University, *Committee Hansard*, 5 June 2018, p. 4.

47 *Committee Hansard*, 14 June 2018, p. 54.

48 *Committee Hansard*, 14 June 2018, p. 4.

meet the very strong demand, and why can't everyone get a connection just like those in the cities?

Quite simply, it's the astronomical cost, and this has been recognised by all governments.⁴⁹

2.44 Mr Morrow continued, noting the cost for connecting some of the most remote premises to fixed line connections:

The original 2010 NBN Implementation Study contains a graph...that shows the cost of a fixed line connection for the most remote 10 per cent of premises. Many of them sat above the \$20,000 mark, in 2010 dollars, just for one single premises. As you get to the most remote premises, that number grows exponentially. Anyone can do the maths and realise that the fixed line is not a feasible solution for connecting these areas. NBN has now almost completed an ambitious and cutting-edge plan to get people in remote and regional Australia the best possible service.⁵⁰

2.45 Of concerns that consumers were not necessarily receiving the best technology available, Mr Morrow advised the committee that the nbn's obligation was not the delivery of the best technology available, but to deliver a guaranteed minimum service:

...Again, I know many people would love to have the best technology cabled right up into their home. I would remind the senator again of this business model that someone has to pay for that...The idea of having technology that provides more than what consumers need is a cost that is not prudent to spend, hence the reason that we will find the best technology at the least possible cost that delivers it as soon as possible and still meets this performance expectation of a minimum of 25 megabits per second for everybody and 81 per cent of the nation to get 50 meg or better. That's the reason why not everybody...is getting the fibre to the curb. As for one state having a different portion of technology or a different mix of technology than exists for every state and every territory in the country, that is not an issue by design; it's an issue by looking at the practicality and feasibility of getting this minimum service to every end user in the country. ...Remember, if we did provide more fibre to everybody round the country, we'd all be paying a far higher price than what we're paying today for our broadband services.⁵¹

2.46 Mr Morrow referred to nbn's user-pays business model:

That means there are no one-off taxpayer subsidies, no one-off payments from the government on which they don't get a return back. In order to serve all of these premises—it is uneconomical to do so, and no investor would ever go near them—we take the profits that we made in the city

49 *Committee Hansard*, 4 June 2018, p. 41.

50 *Committee Hansard*, 4 June 2018, p. 41.

51 *Committee Hansard*, 4 June 2018, p. 46.

centres and cross-subsidise for the losses that we make in these remote areas.⁵²

2.47 Mr Morrow expanded on this cross-subsidy:

An inherent cross-subsidy means prices in the city need to be high enough to provide funds for good services in the non-profitable areas. It is, quite frankly, a tight model that can, on the one hand, expose NBN to greater competition as other providers seek to undercut our prices, and, on the other hand, could lead to cost increases as greater demand and usage patterns emerge in regional areas.⁵³

Regional Broadband Scheme

2.48 In their joint submission, Communications and Finance noted that nbn's fixed wireless and satellite infrastructure 'is expected to incur losses of around \$9.8 billion (net present value) over 30 years'.⁵⁴ The government has introduced legislation, Telecommunications (Regional Broadband Scheme) Charge Bill 2018 (RBS Bill), to 'establish a sustainable funding mechanism to ensure nbn can continue to deliver the benefits of high speed broadband to regional Australia'.⁵⁵ The committee notes that this legislation was introduced in June 2017 and passed by the House of Representatives in May 2018, but has not yet passed the Senate, raising questions about the commitment of the government to its own levy design.

2.49 The Explanatory Memorandum to the RBS Bill stated:

[The funding mechanism] will require all carriers including nbn, to contribute funding at a rate of approximately \$7.10 per month, per chargeable premises. Chargeable premises are premises where a carriage service provider (ie a provider of retail broadband services) provides a designated broadband service. A designated broadband service is a carriage service provided over a fixed line that is technically capable of providing download transmission speeds of 25 megabits per second (Mbps) or more.⁵⁶

2.50 Mr Andrew Madsen, Assistant Secretary, Broadband Implementation Branch, Infrastructure and Consumer Division, Communications, explained how the figure for the change was determined. Mr Madsen informed the committee that modelling undertaken in 2014–15 provided the estimate for the \$9.8 billion loss for fixed wireless and satellite infrastructure:

Then they worked back from that to calculate what a charge on a per service basis would be if the cost of that infrastructure was recovered from

52 *Committee Hansard*, 4 June 2018, p. 43.

53 Chief Executive Officer, nbn, *Committee Hansard*, 4 June 2018, p. 41.

54 Department of Communications and the Arts and Department of Finance, *Submission 10*, p. 2.

55 Telecommunications (Regional Broadband Scheme) Charge Bill 2018, Revised Explanatory Memorandum, p. 2.

56 Telecommunications (Regional Broadband Scheme) Charge Bill 2018, Revised Explanatory Memorandum, p. 2.

all services that were delivering an NBN-comparable service over a fixed line.⁵⁷

2.51 In terms of whether the modelling needed to be updated, given it was undertaken a number of years ago, Mr Madsen stated:

The modelling still uses the same assumptions and the same estimates around cost. However, in the budget papers that have been published since then, the estimates have been updated to reflect changes in the anticipated number of services that would be contributing towards that cost and as the government has made any other changes to the way in which the Regional Broadband Scheme may operate.⁵⁸

2.52 Mr Madsen stated that recently the government announced a concession to RSPs by way of an exemption from the RBS charge for a period [of five years] for the first 25 000 lines for each carrier's networks.⁵⁹

2.53 In its joint submission, Communications and Finance referred to the combined effect of the legislation for the Statutory Infrastructure Provider (SIP) and the RBS:

Together, the SIP and the RBS will ensure regional, rural and remote Australians continue to enjoy all the benefits of high speed broadband into the future.⁶⁰

2.54 ACCAN recorded its support for the scheme:

[We] support the regional broadband scheme and we think it's important, because we want to make sure that NBN is a sustainable model and has sustainable funding going forward, obviously there are lots of different ways to do this, and we haven't actually put forward a preference for which way it should be done. What we have said is that services in regional areas absolutely must be subsidised in order to make sure that those consumers are connected. We understand, and so do the consumers in those areas, that it's extremely expensive to provide services in rural and regional Australia. However, the benefit that we derive as a nation far outshines that.⁶¹

2.55 Ms Corbin indicated that the only concern ACCAN had was the impact on the ongoing affordability for some consumers that are using non-NBN services and whether or not that might push up the overall price.⁶²

2.56 The committee notes that since the introduction of the RBS Bill into the House of Representatives on 22 June 2017, the government has amended the bill to address concerns raised by the Senate Standing Committee for the Scrutiny of Bills and the Senate Environment and Communications Legislation Committee.

57 *Committee Hansard*, 14 June 2018, p. 37.

58 *Committee Hansard*, 14 June 2018, p. 37

59 *Committee Hansard*, 14 June 2018, p. 37.

60 Department of Communications and the Arts and Department of Finance, *Submission 10*, p. 2.

61 *Committee Hansard*, 4 June 2018, p. 28.

62 *Committee Hansard*, 4 June 2018, p. 28.

2.57 The committee notes that the RBS is just one of the subsidies provided to support regional communications and that it is desirable that in the future that the RBS is considered together with the Universal Service Obligation so that less of a piecemeal approach can be taken to these subsidies.

2.58 The committee also notes that both the ACCC and Productivity Commission have stated that the RBS could have distortionary effects on the market and is unlikely to serve as a sustainable funding mechanism.

Investment and optimisation of infrastructure

2.59 A number of submissions emphasised the need for further investment in fibre infrastructure in rural and regional areas. BIRRR contended that nbn 'should now be tasked with establishing a path for the evolution of the network, to ensure it meets future needs of [rural, regional and remote (RRR)] areas.⁶³ BIRRR's submission stated:

This future planning must include a greater investment in fibre in regional areas to ensure that the digital divide currently existing between RRR users and metropolitan users does not widen.⁶⁴

2.60 Further, BIRRR recommended the government undertake an audit into fibre and infrastructure across Australia.⁶⁵

2.61 The WA Government advised that it has already undertaken an infrastructure audit, which identified a significant amount of under-utilised government, community and privately-owned communications infrastructure which could be leveraged cost effectively.⁶⁶ The WA Government advocated for the introduction of cooperative investment in and use of existing regional telecommunications infrastructure, contending that it would result in better returns on investment, lower costs for service providers and genuinely competitive services for end users of broadband services.⁶⁷

2.62 Ms Robinson, NT Government, advised the committee that the NT Government has consistently lobbied the Australian Government and nbn over years to seek a way to effectively utilise existing optic-fibre infrastructure in the NT, but nbn's response remains that the NT is to receive satellite.⁶⁸ The NT government contended:

...the demands placed on the NBN Sky Muster services will be alleviated by moving significant numbers of users to terrestrial services.⁶⁹

63 BIRRR, *Submission 14*, p. 20.

64 BIRRR, *Submission 14*, p. 20.

65 BIRRR, *Submission 14*, p. 7.

66 Western Australian Government, *Submission 20*, p. 8.

67 Western Australian Government, *Submission 20*, p. 10.

68 *Committee Hansard*, 14 June 2018, pp. 31–32.

69 Northern Territory Government, *Submission 2*, p. 3.

Chapter 3

Technology issues for regional and rural Australia

Introduction

3.1 A key focus during this inquiry was technology issues relevant to the delivery of NBN. This chapter examines the variety of technology challenges facing the delivery of the broadband to regional and rural Australia.

3.2 This chapter also focuses on issues relating to the mapping of technology to these areas as well as capacity and costs in relation to individual technologies. Although there is a commonality between the concerns experienced, the different services have their own unique challenges.

Satellite services

3.3 The committee's first report provided a short background to nbn's Sky Muster satellites.¹ The Sky Muster satellites replaced the Interim Satellite Service (ISS) which was switched off on 28th February 2017 with all ISS customers migrating to the new Sky Muster satellite service.²

3.4 Mr Bill Morrow, CEO, nbn, told the committee there was a significant difference between the ISS and Sky Muster:

The interim satellite service began to just address some of those people who had no service whatsoever. It borrowed from other satellite owners capacity not owned by NBN or the government and spread that capacity quite thin across a number of users. With the limitations of that older technology that the satellites were made of, if anybody tried to pick up the speed on this—and the more people who were put on it—it had a severe negative effect in terms of the experience. The new satellites that have gone up were the most technology advanced at the time to provide a gigabit per second bandwidth capability beaming from the satellites down here to the country. That enabled more people to use it, faster speeds than ever before and a greater level of capacity.³

3.5 In Chapter 2, the committee set out the customer experiences with nbn's satellite services, particularly in the last 12 months. In this section of the report the committee considers the evidence it has received on the issues in relation to Sky Muster satellite services.

1 Joint Standing Committee on the NBN, *First report*, September 2017, pp 67–68. See also: nbn™ Sky Muster™ satellite explained, available at: <https://www.nbnco.com.au/residential/learn/network-technology/sky-muster-explained.html> (accessed 2 July 2018).

2 nbn™ Interim Satellite Service, available at: https://www.skymesh.net.au/interim-satellite-service/?gclid=EA1aIQobChMIsKql68z_2wIVjxWPChInFQoBEAAYASAAEgKyEvD_BwE (accessed 2 July 2018).

3 *Committee Hansard*, 4 June 2018, p. 42.

Fair Use Policy and data caps

3.6 As discussed earlier, a Fair Use Policy (FUP) applies between nbn and RSPs offering Sky Muster satellite services to 'ensure fair access to the services over the...satellites, including during peak-usage'.⁴ As Mr Peter Girvan, Asia-Pacific Vice-President of Viasat observed, satellite is a finite and therefore costly resource and it should be managed carefully:

The difficulty with satellite, always, is that it's a scarce, finite resource—it's very valuable; it costs you a lot of money—and what you want to do is to use that scarce capacity as effectively and efficiently as possible.⁵

3.7 As the committee noted in its first report, in June 2017 nbn announced changes to the FUP which would allow for an increase in data available on Sky Muster plans.⁶ As noted in Chapter 2, in the course of this inquiry the committee were informed that this increase in data available on plans for the satellite services was supported and welcomed in the community. However, submitters and witnesses contended that more could be done in relation to the FUP and plans available for satellite service.

3.8 At the public hearing in Canberra, Ms Teresa Corbin, CEO, Australian Communications and Consumer Action Network (ACCAN), described the FUP as 'complex and confusing'.⁷ Ms Corbin stated:

Despite the improved performance and positive reports that we have received, particularly from NBN, and the reliability information that they're now providing to us, there are still outstanding concerns for consumers, particularly in relation to managing data across peak and off-peak times, which can be challenging even with increased allowances...⁸

3.9 In its submission, ACCAN explained its belief that a handful of consumers have been penalised because of the FUP, stating that this is not fair for consumers:

In the anecdotal case that ACCAN has heard of, the consumer did not breach their monthly data allowance but had their service restricted. They were not warned about this and the data usage tools that were available to them did not assist them.⁹

3.10 The Warrumbungle Shire Council (WSC) observed that off peak satellite usage is neither useful nor viable for residents or businesses whose main hours of

4 nbn co website, *Will there be a Fair Usage Policy in place for the nbn Sky Muster satellite service?*, available at: <https://www.nbnco.com.au/support/articles/000001106/will-there-be-a-fair-usage-policy-in-place-for-the-nbn--sky-muster--satellite-service> (accessed 20 August 2018).

5 *Committee Hansard*, 5 June 2018, p. 40.

6 Joint Standing Committee on the NBN, *First Report*, pp. 81–82.

7 *Committee Hansard*, 4 June 2018, p. 23.

8 *Committee Hansard*, 4 June 2018, p. 23.

9 ACCAN, *Submission 12*, p. 9.

operation are between 9.00 am and 5:30 pm.¹⁰ Mrs Kristy Sparrow, of Better Internet for Rural, Regional and Remote Australia (BIRRR), observed that 'off-peak data is quite difficult to use' on satellite connections and suggested that 'there could be routers that count the data to help people effectively manage their use'. Furthermore, the use of multicast technology could assist in reducing data usage for both off- and on-peak use.¹¹

3.11 In its submission, BIRRR argued that there is 'a very large disparity' in costs and data allowances between Sky Muster and other nbn technologies. BIRRR stated that the FUP currently:

restricts RSPs on average to **45GB** of downloads per customer in any four week period...

limits the peak-hour data usage of individual customers to no more than 150GB in any four week period...

the **maximum** data plans offered by nbn Sky Muster providers (on average for peak data plans 12/1 speed) was **131.81GB** Peak Data (across 11 providers), at a plan cost of on average **\$141.34** per month or **\$1.10** per GB of PEAK data...¹²

3.12 BIRRR noted that the FUP has resulted in regional, rural and remote residents who have access to mobile broadband find themselves paying for two broadband connections to meet their data needs—Sky Muster and mobile broadband.¹³ BIRRR also noted that those who have no access to mobile broadband have to manage their data within the FUP restrictions. Ms Kathleen Robinson, Chief Executive, Department of Corporate and Information Services, Northern Territory (NT Government), similarly remarked that while nbn had recently doubled the data allowances for Sky Muster, the FUP disadvantages remote residents and businesses who have no alternative method for connecting to essential online services. Ms Robinson recommended a separate and more lenient policy to be developed for people in this category.¹⁴

3.13 BIRRR relayed its concerns that, as data needs grow, regional, rural and remote Sky Muster users will once again be left behind.¹⁵ However, Mrs Sparrow, BIRRR, did note that Sky Muster platform FUP works very well at making sure that certain users do not take all of the Sky Muster's data and capacity.¹⁶

10 Warrumbungle Shire Council, *Submission 9*, p. 2. See also, BIRRR, *Submission 14*, p. 17.

11 *Committee Hansard*, 4 June 2018, p. 70.

12 BIRRR, *Submission 14*, p. 16. Emphasis in original.

13 BIRRR, *Submission 14*, p. 16.

14 *Committee Hansard*, 14 June 2018, p. 30.

15 BIRRR, *Submission 15*, p. 16. See also, NSW Farmers, *Submission 15*, p. 12; ACCAN, *Submission 12*, pp. 7 and 10.

16 *Committee Hansard*, 4 June 2018, p. 72

3.14 Ms Georgie Somerset, Chair, Telecommunications Committee, AgForce Queensland, (AgForce), advised the committee that AgForce has constantly advocated for the FUP to be modified to allow a greater data allocation per person. Ms Somerset further advised that it would also be much easier to have multiple installations on properties where there are multiple premises, or to be able to have both business and personal accounts, in circumstances where an individual, family or families are working and living in the same premises and needing to share that data between business and home.¹⁷

3.15 NSW Farmers stated that when NBN was designed, farms were treated as households rather than businesses, with the result that plans for Sky Muster were inadequate as being too narrow in scope for large agricultural businesses that extend across vast geographical spaces and cross state boundaries. NSW Farmers also commented that if satellite is to be the only service option available to remote customers, nbn must ensure these customers are afforded plans comparable for non-satellite customers to ensure equity in accessibility.¹⁸ NSW Farmers recommended stakeholder consultations be expedited for the early launch the Sky Muster business plans.¹⁹

3.16 Mr Peter Girvan, Asia-Pacific Vice President, Viasat observed that satellite is the only technology within the NBN system that uses a FUP. Mr Girvan noted that the United States has moved away from the use of hard cap FUPs to unlimited 'soft cap' plans.²⁰

3.17 A number of submissions noted that while there was an announcement in late 2017 of business plans being made available on Sky Muster, as yet no such plans were available. BIRRR referred to nbn awarding a 10-year, \$184 million contract, to Speedcast, a remote communications and IT solutions provider, for the provision of enterprise-grade satellite services, which should be available by early 2019:

In the meantime [rural, regional and remote] businesses have had to 'make do' with current data limits or spend extensive amounts on setting up Wi-Fi equipment and mobile broadband plans.²¹

Improving capacity on the satellite

3.18 Viasat contended that there are realistic and feasible steps that can be taken to make satellite broadband a more attractive and robust service than is currently offered, without impacting on the nbn's economic return on the Sky Muster satellites. Viasat suggested the introduction of 'Layer 3' technology and the introduction of an additional Sky Muster satellite.²²

17 *Committee Hansard*, 14 June 2018, p. 53.

18 NSW Farmers, *Submission 15*, p. 8.

19 NSW Farmers, *Submission 15*, p. 13.

20 *Committee Hansard*, 5 June 2018, p. 43.

21 BIRRR, *Submission 14*, p. 17.

22 Viasat, *Submission 6*, pp. 1–2.

3.19 Mr Peter Girvan explained the difference between a layer 2 and a layer 3 system:

If you consider us, as consumers, there are probably, at a very high level, three types of data that you have on the network: No. 1 is video streaming, where we sit and watch something on YouTube or a streaming video from Stan or Netflix; No. 2 is web browsing, internet shopping and home banking; No. 3 is email. As users, we have a sensitivity to delays in those pieces of data on the network, and they are different. We are more sensitive to delays in video-streaming traffic because we see videos stuttering on the screen and it's very annoying. We're less sensitive to delays in web browsing because it just takes the page a little bit longer to load. And we're probably the least sensitive to receiving an email, say, half a second late.

As to layer 2, if you can think of the internet network as a three-lane freeway, with all the cars of the same make and model, the video-streaming cars are red, the web-browsing cars are yellow and the email cars are blue, and they're running in three separate lanes. At layer 2, the network is colour blind—it can't tell the difference between a video piece of data and an email piece of data. So when you come to take that data off the freeway onto the on-ramp that is your satellite connection, you typically have to allocate a wider exit ramp. Because we're more sensitive to video, we want the video to come off at the same time, so we sort of send everything off at the same time so that we don't ruin our video experience. When you move to layer 3, the network becomes colour-aware. So at the off-ramp you can put a smart traffic cop to say, 'Let all the red cars go first,' and if you have to hold up the blue and yellow ones for a little period of time to let the red ones through then you do that. Literally, we call that traffic management. That enables you to then rationalise the size of your off-ramp, based on your priorities. So you maintain the customer experience while conserving some network resources.²³

3.20 Viasat noted that the introduction of 'Layer 3' technology would render hard data caps obsolete as a method of controlling capacity utilisation. Alternate mechanisms are available to manage data usage, such as soft caps, video optimisation techniques, expanded free zones and unlimited non-video usage which are underpinned by traffic management techniques which are only available on 'layer 3' technology. Layer 3 technology is a data traffic management system.²⁴

3.21 Mr Girvan advised the committee that implementing a layer-3 network traffic and policy management program on the Sky Muster network could double the amount of data that could be consumed by customers while preserving the service quality at the same economics to NBN as today's service.²⁵

3.22 Viasat also recommended increasing satellite bandwidth by acquiring additional satellite capacity based on the technology. As matters stand, Viasat

23 *Committee Hansard*, 5 June 2018, p. 40.

24 Viasat, *Submission 6*, p. 3.

25 *Committee Hansard*, 5 June 2018, p. 39.

envisaged that Sky Muster will be at maximum capacity by 2020 if a level of service such as 150GBs per month is offered.²⁶

3.23 At the hearing, Mr Morrow confirmed that NBN is a 'layer 2 service'.²⁷ He also stated that nbn is not considering a third satellite in the nbn business plan.²⁸

Satellite Services

3.24 nbn's Corporate Plan 2018-21 forecast that by the end of financial year 2018 400 000 premises will be ready for satellite service and 100 000 premises will be activated.²⁹ As at 30 June 2018 there were 430 449 premises ready to connect to Sky Muster services, and 90 327 premises activated.³⁰ Mr Andrew Madsen, Assistant Secretary, Broadband Implementation Branch, Communications, confirmed that the take-up rate for satellite is slightly lower than forecast, but observed that it is still early in the life span of satellites. In terms of whether there was concern over this lower uptake, Mr Madsen indicated that Communications were 'waiting to see what nbn says in its corporate plan and projects about the take-up rate over the next year—whether it estimates that it's then going to come back up to its long-term trajectory'.³¹

3.25 The committee canvassed with a number of witnesses the reasons for the low take up of satellite services.

3.26 ACCAN considered the expected take up rate of Sky Muster services of about 40 percent (200 000 premises) of the potential number of premises in the four percent to be served by satellite to be overly optimistic. ACCAN stated that the reason the low take up was the availability of other service options such as extended mobile coverage, ADSL and alternative service providers to meet needs in regional and rural areas, noting that these other services are likely to have higher data limits than Sky Muster at a comparable price.³²

3.27 Professor Mark Gregory, Associate Professor, RMIT University, considered there would be a higher uptake of satellite if the FUP were varied to provide greater bandwidth, data download and upload capacity.³³ However, Mr Tony Bundrock, Chairman, Australian Private Networks observed that it is hard to know how many people do not take up satellite because of the FUP limitation:

26 Viasat, *Submission 6*, p. 7; see also, Northern Territory Government, *Submission 2*, p. 2.

27 *Committee Hansard*, 4 June 2018, p. 50.

28 *Committee Hansard*, 4 June 2018, p. 51.

29 nbn co, *Corporate Plan 2018–21*, pp. 36 and 39.

30 National Broadband Network, Rollout Information, *Weekly progress report for the week ending 9 August 2018*, available at: <https://www.nbnco.com.au/corporate-information/about-nbn-co/corporate-plan/weekly-progress-report.html> (accessed 20 August 2018).

31 *Committee Hansard*, 15 August 2018, pp. 3–4.

32 ACCAN, *Submission 12*, pp. 6–7.

33 *Committee Hansard*, 5 June 2018, p. 7.

Many people who are eligible for the satellite don't really have any other significantly better alternative, but they're not happy with the data limitations.³⁴

3.28 Professor Gregory also attributed the low take up of satellite to the lack of 'one-hop voice capability'. The result is that some people in regional and remote Australia, especially people on the satellite will be paying for mobile services, for their dial-up phone line on copper and for Sky Muster. Paying for three different services all adds up, costing too much.³⁵

3.29 Mrs Sparrow, BIRRR, noted that people who are satisfied with their current ADSL service are delaying migration to a satellite service that they are uncertain about:

There are lots of reasons why people aren't signing up to Sky Muster, and one of the top ones is that they're already on a plan with another technology such as ADSL or an alternative fixed wireless that meets their needs.³⁶

3.30 Mrs Sparrow also indicated that confusion about the type of NBN service a premise was mapped to, or an issue with an address not being able to be located on nbn's map, are contributing to the low take-up of Sky Muster services.³⁷

3.31 Both BIRRR and ACCAN contended that there was more that RSPs could be doing to assist customers. As Mrs Sparrow, BIRRR, explained to the committee:

I think the providers need to be reminded that NBN doesn't actually deal with customers. The customers are actually contracted to the providers. The providers need to do a lot more in this space. We've had lots of reports of people ringing up to try and get connected to the NBN and being told, 'I'm sorry; it's not coming to you,' when actually that provider may not even be a Sky Muster provider. I think the providers definitely need to have a much larger role in this space. I'd really like—and it's next on my hit list—to have a sit-down with the NBN marketing team, because I think somewhere along the line we've lost this 'every Australian resident is entitled to an NBN connection by 2020'. It seems to have been lost in space.³⁸

3.32 ACCAN also noted that some information being provided by RSPs to consumers is leading to confusion:

Satellite products are not being sold by Telstra and many consumers in these Satellite mapped areas are currently buying products from Telstra. Many are not aware that there are other providers or options available to

34 *Committee Hansard*, 5 June 2018, p. 48.

35 *Committee Hansard*, 5 June 2018, p. 7.

36 *Committee Hansard*, 4 June 2018, p. 71.

37 *Committee Hansard*, 4 June 2018, p. 71.

38 *Committee Hansard*, 4 June 2018, p. 70.

them. When contacting Telstra many are advised that there are no NBN products available to them.³⁹

3.33 Mr Stephen Rue, Chief Financial Officer, nbn, advised the committee that nbn local is travelling the countryside with a truck to demonstrate satellite capacity to regional and rural Australia, but that it was for RSPs to market the product to end-users. Mr Rue observed that:

[RSPs are] aware of the fact that end users on the satellite service actually are very happy with the service they receive.⁴⁰

Fixed wireless network

3.34 As discussed in Chapter 2, the issue of congestion was identified as a significant issue for fixed wire services. Mr Morrow, CEO, nbn, explained the cause of the congestion:

...as user experience has intensified, what we have seen on the fixed wireless is a greater level of concurrency: the number of people using it at exactly the same time is greater than ever seen before on a wireless network anywhere that we have data from around the world. In addition to that, we are seeing the take-up occur sooner than was originally estimated. And consumption continues to grow: people's appetite for data has completely changed the model that was used to determine the level of service and capacity that should be engineered into these networks.⁴¹

3.35 Mr Morrow outlined the impact of the congestion on the network:

The busy time in fixed wireless is less than six per cent of the cells will drop down to six megabits per second. It's about a 2½ hour window where we see that it can run over. That's the contended time.⁴²

3.36 However, it was suggested to the committee that this may be underestimating the number of towers experiencing congestion. Mr Phillip Britt, Managing Director, Aussie Broadband, said he felt it was more like 18 to 20 per cent of towers, based on speed testing data that his company had done.⁴³

3.37 Mr Morrow also detailed the steps that nbn are taking to address the issue:

As that pressure has come up on this—and you have a cap on keeping this business model together—we have to be quite innovative about how we are going to relieve some of the congestion for the number of cells that were experiencing that level of congestion. That is when we made a further investment: basically, we took profit away from the company, which was modest to begin with, and applied it towards the fixed wireless area. We spent enough to move that minimum of three megabits up to a minimum of

39 ACCAN, *Submission 9*, p. 7. See also: NSW Farmers, *Submission 15*, p. 9.

40 *Committee Hansard*, 15 August 2018, p. 6

41 *Committee Hansard*, 4 June 2018, p. 43.

42 *Committee Hansard*, 4 June 2018, p. 47.

43 *Committee Hansard*, 5 June 2018, p. 33.

six megabits. To put that in context, the number of cells that we have experiencing six megabits per second or less is now less than six per cent.⁴⁴

3.38 In August 2018, Mr Rue provided the committee with an update on managing congestion on the fixed wireless network:

To date, more than 3,100 cells across the NBN fixed wireless network have had capacity upgrades completed and of these more than 2,200 were completed so far this calendar year, with a similar number scheduled by the end of this year. We continue to examine options to help manage demand on the network, but we will consult with industry before adopting any new initiatives.⁴⁵

3.39 Mr Peter Ryan, Chief Network Engineer, nbn, provided the following timeline for completion of the work on upgrading the congested towers:

When the decision was made in the back half of last year to raise the threshold for putting, deploying capacity to sites from three megabits to six megabits, we knew at that time that the typical cycle time to deploy that capacity upgrade could be anywhere from 12 to 18 months...We always knew it would take somewhere between towards the end of this year and early into the following year to be able to complete. We are seeing that the rate at which we're deploying capacity upgrades is increasing all the time. ...We're certainly targeting the middle of next year to get that back down to acceptable thresholds and we're seeing that drop all the time.⁴⁶

3.40 Mr Morrow also confirmed that nbn were evaluating a form of fair use policy, but that the company was 'not yet at the point of proposing anything'.⁴⁷ Mr Morrow elaborated:

When you consider this notion of a fair use policy, we have a model within the satellite services that we use, and then there are several variants of that. But it is quite interesting, our average consumption across the NBN network is just under 200 gigabytes per month, and when you look at the fixed wireless it's substantially less than that, so these users aren't as heavy. However, in the fixed wireless, there's a large portion that are using terabytes of data. Now, one of the things that we're evaluating...[during] the contended period. We're evaluating a form of fair use policy to say that we would groom these extreme users...

...the grooming could be that, during the busy period of the day when these heavy users are impacting the majority, they actually get throttled back to where they're taking down what everybody else is taking down, and during the non-congested or non-busy periods they're free to go for as much data as they want to pull down.⁴⁸

44 *Committee Hansard*, 4 June 2018, p. 43.

45 *Committee Hansard*, 15 August 2018, p. 5.

46 *Committee Hansard*, 15 August 2018, p. 6.

47 *Committee Hansard*, 4 June 2018, p. 48.

48 *Committee Hansard*, 4 June 2018, p. 48.

3.41 There was some debate among witnesses as to whether the work being done by nbn to address congestion was sufficient. Dr Paul Brooks, Chair, Internet Australia, explained that in his view, the congestion problems are fixable and temporary:

...that is a temporary thing. Once all the people in an area are connected to the tower—and that's supposed to happen by 2021 or so—the ramp-up slows down, and that provides NBN Co with an opportunity to catch up on the connection from the network into the tower. So the congestion elements of the fixed wireless connection at the moment are understandable, but they're fixable and I believe they're temporary.⁴⁹

3.42 However, Ms Isabella McDougall, Policy Adviser, NSW Farmers, among others, recommended that, if the nbn knows that a tower is too congested to take any more customers on, the nbn should halt the RSPs selling any plans to regional and rural consumers who want to get onto the fixed wireless tower until it has fixed the issue.⁵⁰

3.43 Aussie Broadband considered that the rollout of the fixed wireless program should be paused while nbn addresses issues of congestion on fixed wireless towers.⁵¹

3.44 Aussie Broadband noted that there was no agreed industry standard on what constitutes 'congestion', leading to confusion for customers and stakeholders.⁵² Mr Phillip Britt, Managing Director, Aussie Broadband, spoke of his concerns that nbn had placed a minimum speed during congested times for customer on a 50 Mbps plan of 6 mbps, noting that this did not align with 'the ACCC definition for fixed line [minimum]...that anything below 30 megabits per second would be unacceptable'.⁵³

3.45 At the public hearing in Melbourne, Mr Sean Riordan, General Manager, Industry Structure and Compliance Branch, ACCC, stated that the ACCC was 'engaging quite actively with NBN over their plans for the fixed-wireless service':

There are a few steps which I think would be very beneficial in allowing not just us but the public more generally to have transparency over how well they're tracking in redressing the issue.

...

The main step would be to commence in their dashboard reporting or similar how they're tracking in redressing the cells which don't currently qualify or meet their own design standard for the six-megabit-per-second-per-end-user in the busy hour. That would be one simple step which they could take and that would at least give people an informed information base to make some policy and other decisions.

49 *Committee Hansard*, 5 June 2018, p. 20.

50 *Committee Hansard*, 4 June 2018, p. 17. See also: See also: ACCAN, *Submission 12*, p. 8; BIRRR, *Submission 14*, p. 19.

51 Aussie Broadband, *Submission 4*, p. 1.

52 Aussie Broadband, *Submission 4*, p. 2;

53 *Committee Hansard*, 5 June 2018, p. 31.

The other work that we would like to do is to look to see what consumers are being advised at the time they're making their purchase decisions, whether they're being advised that the service that they're looking to acquire is actually in a cell which is contested.⁵⁴

Withdrawal of the 100 Mbps product

3.46 Mr Morrow emphasised to the committee that nbn made 'tough planning decisions to keep costs down and to manage capacity on the networks'.⁵⁵ On this point Mr Morrow confirmed to the committee that nbn would not be proceeding with the roll-out of the 100mbps service on fixed wireless, which was announced in the Corporate Plan 2018-2021:

As with any wireless broadband solution, capacity is finite and needs to be carefully managed to provide the best possible customer experience. Providing more capacity can mean upgrading the equipment on towers and in homes and greater backhaul capacity. In some cases, it may require more spectrum...We felt the priority needed to be on maintaining current services and focusing on upgrades where required, not introducing a product that would put more pressure on the network.⁵⁶

3.47 At the public hearing in August, Mr Rue spoke further on nbn's decision not to proceed with the 100 Mbps product on fixed wireless:

As we learnt more through the year and as we looked at the mechanics of what was going to be required for both the launch of that product and the impact upon other users who would be on shared cells, a decision was made for the good of everybody that it was not sensible to launch that product.

...

If we were to maintain a user experience for existing customers on the fixed wireless network, it would have required us to spend much more capital on the fixed wireless network. It's related to the experience of existing users.⁵⁷

3.48 Mr Rue indicated that the additional capital required for the 100Mbps product 'would have been a lot of money—hundreds of millions of dollars'.⁵⁸

Speed monitoring and reporting program

3.49 The ACCC manages a monitoring and reporting program ('Measuring Broadband Australia' program) which provides consumers with information about NBN fixed line broadband speeds and performance.⁵⁹

54 *Committee Hansard*, 5 June 2018, p. 29.

55 *Committee Hansard*, 4 June 2018, p. 41.

56 *Committee Hansard*, 4 June 2018, p. 41.

57 *Committee Hansard*, 15 August 2018, p. 8.

58 *Committee Hansard*, 15 August 2018, p. 8.

59 Australian Competition and Consumer Commission, *Measuring Broadband Australia program*, available at: <https://www.accc.gov.au/regulated-infrastructure/communications/monitoring-reporting/measuring-broadband-australia-program> (accessed 22 August 2018).

3.50 At the public hearing in Melbourne, officers from the ACCC informed the committee that the program, which had its first testing period in February 2018 'gives public visibility over the performance of the larger RSPs in delivering on their speed claims during the busy hours and off-peak hours'.⁶⁰

3.51 Mr Riordan, ACCC, informed the committee:

[The services] performed...much better than we had anticipated when the program was first established, and in large part there was a significant shift in the wholesale market shortly before that testing commenced, such that there was a lot more capacity being acquired by the RSPs as we came into the testing period.⁶¹

3.52 Mr Riordan stated that at present over 1 000 services are being monitored, and this will be scaled up to 4 000 as the NBN rollout continues.⁶² However, at present, fixed wireless services are excluded from the program. Mr Riordan explained that ACCC had excluded the fixed wireless services from the program:

It was done on the basis that we felt there was a need to act quickly in the fixed line footprint where most of the services were on issue. There was certainly more acceptance of testing of the fixed line footprint by RSPs...

There is a lot of nervousness amongst the retailers about the fixed wireless services coming into the scope of the program.⁶³

3.53 The committee asked whether the monitoring and performance program could be extended to fixed wireless services. Mr Riordan indicated that government support would be required in order to extend the service to fixed wireless services:

There's no impediment; the technology works over the fixed wireless platform.

....

The support is in the nature of financial support. It's not seeking permission from the government to do this.

...

It's to get the additional measuring devices that we would need.⁶⁴

3.54 Mr Riordan stated that 'quite a few' measuring devices would be required 'because the fixed wireless service is relatively variable'.⁶⁵ He continued:

In some localities it works quite well; in some instances it works quite poorly and on a sporadic basis, just with weather conditions. It's just a far

60 *Committee Hansard*, 5 June 2018, p. 22.

61 *Committee Hansard*, 5 June 2018, p. 22.

62 *Committee Hansard*, 5 June 2018, p. 23.

63 *Committee Hansard*, 5 June 2018, p. 23.

64 *Committee Hansard*, 5 June 2018, p. 23.

65 *Committee Hansard*, 5 June 2018, p. 23.

more variable service, so, before you can have confidence at a statistical level that what you're measuring is representative of the services generally and the performance of retailers generally over that technology, there's a good argument that you just need more of the devices.⁶⁶

3.55 Mr Riordan indicated that approximately \$6 million over four years would be required to extend the reporting program to fixed wireless services.⁶⁷

Fibre to the Node

3.56 The committee received some evidence in relation to the Fibre-to-the-Node (FTTN) network. In general, submissions were critical of FTTN reliance on the copper network. For example, Mr Steve Turner, Owner, Coonabarabran Business Centre and Computer Hospital observed that FTTN does not augur well for the future of NBN as it relies on 'decades-old copper cabling'. He stated that in rural areas the cabling is more likely to be older and less likely to have been serviced or replaced over time by major carriers.⁶⁸ BIRRR made a similar point, stating that issues with the quality of FTTN services are widespread but especially noticeable in regional towns, where old and worn copper is affected by bad weather and natural disasters.⁶⁹

3.57 The Queensland Government expressed its concern that FTTN is not sufficiently resilient to withstand extended interruptions during natural disasters, causing a public safety risk. The Queensland Government observed:

FTTN [technology is] unable to provide access to lifesaving services (e.g. calling 000) during power outages. This situation creates serious public safety issues. Any NBN technology solution deployed should always provide access to such lifesaving services, even when power supply is interrupted.⁷⁰

3.58 Mr Morrow defended the use of FTTN in the multi-technology mix:

I don't regard fibre to the node as inferior for the service that we are asked to provide.⁷¹

3.59 The committee notes that around 70 per cent of regional and rural Australia receives fixed line technology, predominantly Fibre to the Node. The deployment of the faster and more reliable Fibre to the Curb (FTTC) technology has been concentrated in metropolitan areas.

66 *Committee Hansard*, 5 June 2018, p. 23.

67 *Committee Hansard*, 5 June 2018, p. 23.

68 Coonabarabran Business Centre and Computer Hospital, *Submission 5*, p. 4. See also Western Australian Government, *Submission 20*, p. 10.

69 BIRRR, *Submission 14*, p. 19.

70 Queensland Government, *Submission 13*, pp. 6–7.

71 *Committee Hansard*, 4 June 2018, p. 58.

Technology mapping

3.60 Submitters expressed concern that there has been little to no visibility in the nbn's decision-making process for the selection of the technology for the rollout. In particular, submitters were keen to understand the basis for the selection of satellite, fixed wire or fixed line service for delivery in specific regional, rural and remote locations.

3.61 BIRRR discussed the planning, mapping and eligibility for satellite, fixed wireless and fixed line services, stating that it has been unable to locate any guidelines followed by nbn that dictate what technology a community is mapped for, and that:

In some cases there appears to be an ad hoc approach and a wave of a wand for several large communities (already receiving ADSL) with many businesses and fibre running through town, yet mapped by nbn for Sky Muster satellite.⁷²

3.62 ACCAN made the following observations about the information available on nbn's online mapping tool:

...The footprint for fixed wireless and satellite and the fixed line boundary is still fluid. A premises may change technology or be in limbo until a later stage of the construction process. ACCAN has found that this is not always accurate. Some consumers have been advised one thing through the nbn website but when contacting a Retail Service Provider (RSP) they have been told a different technology is available.

...The nbn website presents technology information as a clear cut decision. However, there are many grey areas between the fixed wireless and satellite footprint. The online map is based on computer analysis. On the ground, the technology may not be suitable and need to be changed.⁷³

3.63 ACCAN noted that it was possible for consumers to have their premises and technology checked and changed to a different technology and that '[w]hile it can be a difficult process to get a premises re-allocated from NBN satellite to fixed wireless, the hardest part is knowing that it is an option'. ACCAN emphasised that in the reverse situation, where a consumer believed they would be connected to NBN fixed wireless but then receive satellite, this could be very disappointing for consumers.⁷⁴

3.64 ACCAN observed that Sky Muster was intended to provide NBN access for the last three per cent of remote premises in Australia:

Often the figure provided of the total number of premises to be serviced by Sky Muster 1 and 2 was 400,000. However, this projected number is increasing at a concerning rate, raising alarm with consumers that they may be flagged for satellite internet delivery rather than other technologies. In

72 BIRRR, *Submission 14*, p. 9; see also, Professor Reginald Coutts, Coutts Communications, *Committee Hansard*, 14 June 2018, p. 3; AgForce Queensland Farmers, *Committee Hansard*, 14 June 2018, p. 51.

73 ACCAN, *Submission 12*, p. 8.

74 ACCAN, *Submission 12*, p. 8.

addition nbn has revised downwards the total number of premises that it will serve. Combined, this means that a larger percentage of premises in Australia will be relying on satellite services.⁷⁵

3.65 Ms Robinson, NT Government, explained that the percentage of the population serviced by satellite was much greater in the NT:

In the NT, approximately 29 per cent of our population, or around 66,000 people, will only be able to access the NBN by satellite. This compares to the national rate of around four per cent of the Australian population receiving a satellite service.⁷⁶

3.66 Ms Robinson further advised the committee that Darwin, Katherine, Alice Springs, Tennant Creek and Nhulunbuy are the only locations that are not mapped for satellite.⁷⁷

3.67 Mr Douglas Cooke, Senior Director, Digital Policy and Telecommunications, Department of Corporate and Information Services, NT Government, advised the committee that 39 communities currently mapped for satellite have optic fibre backhaul, and 20 communities with optic fibre reticulation within the community. Mr Cooke confirmed that, despite the availability of fibre, these communities continue to be mapped for satellite. Mr Cooke indicated that Telstra own the fibre network in these communities, which nbn would have to lease from Telstra on a commercial lease arrangement, giving rise to an issue of cost for nbn.⁷⁸

3.68 BIRRR, among others, commented on a growing number of residences that are being mapped for satellite, and that some of these addresses are not classified as rural or remote:

It is our view that Sky Muster has been used as a 'dumping ground' for harder-to-install and more expensive connection areas on the metropolitan fringes, when it should have been reserved for those that are truly remote.⁷⁹

3.69 As discussed in Chapter 2 of this report, the committee were told that consumers felt that in being moved from a fixed line ADSL service to satellite, they were moving to an inferior service. Mrs Sparrow, BIRRR, expanded on this argument for the committee, noting that there was no guarantee how long ADSL services would remain available in those areas. Mrs Sparrow advised the committee that she was aware of 1 500 addresses that will lose their ADSL:

If you look at my local town of Alpha, for example, it's on great ADSL2. Everyone's quite happy with it, but it is mapped for Sky Muster. That ADSL isn't being turned off, because ADSL is not going anywhere in Sky Muster and fixed-wireless areas to the best of our knowledge. But this is

75 ACCAN, *Submission 12*, p. 6.

76 *Committee Hansard*, 14 June 2018, p. 30.

77 *Committee Hansard*, 14 June 2016, p. 32.

78 *Committee Hansard*, 14 June 2018, p. 32.

79 BIRRR, *Submission 14*, p. 11.

where it gets a little bit confusing. How can people be assured that that is going to continue, and how long will it continue for? I think that's why we're pointing to the fact that these people are receiving an inferior service.⁸⁰

3.70 The Western Australian (WA) Government stated its opposition to nbn's plan to 'downgrade' dozens of farming businesses across regional and rural locations across Western Australia from its original plan for fixed line or fixed wireless services to Sky Muster satellite services.⁸¹

3.71 The Queensland Government disagreed with the nbn policy of deploying the Sky Muster satellite service wherever it is too costly to deploy fixed line or fixed wire services:

While the use of Sky Muster is acceptable in limited cases, the Queensland Government believes it is not suitable for widespread deployment. The widespread deployment of satellite services would leave many residents and businesses with inadequate services...and creating a digital connectivity divide.⁸²

3.72 Mr Bill Morrow, nbn, observed that nbn is not obliged to provide an even distribution of one type of technology:

Our remit is very clear that the entire nation needs to be covered as soon as possible with a minimum of 25 megabits per second for all, with 91 per cent to get 50 megabits per second. We are told to take a technology-agnostic approach to deliver that. Naturally, NBN is always looking for how to leverage the latest in technology to not only deliver that fastest least-possible-cost minimum-performance guarantee but what can we do to actually do the best possible network within the limits economically that we can work with?⁸³

3.73 Communications, in a joint submission with the Department of Finance (Finance), commented that the rollout of the NBN in rural and regional areas is the most significant public investment in improving regional communications undertaken in Australia. Communications and Finance noted that many difficult to serve premises in regional and rural areas can only be served by satellite services. Notwithstanding this, the vast majority of regional premises will be served by NBN fixed line and fixed wireless broadband services.⁸⁴

80 *Committee Hansard*, 4 June 2018, p. 59.

81 Western Australian Government, *Submission 20*, p. 2.

82 Queensland Government, *Submission 13*, p. 8.

83 *Committee Hansard*, 4 June 2018, p. 58.

84 Department of Communication and the Arts and the Department of Finance, *Submission 10*, p. 1.

Maintaining the ADSL and copper networks

3.74 nbn's website states that the copper network within the fixed wireless and Sky Muster areas will not be switched off:

Premises within these areas will have the choice to keep their existing landline phone service over the copper network active, or switch over to a VoIP (Voice over Internet Protocol) service on the nbn access network through a preferred phone and internet provider – connecting your new phone via the nbn supplied equipment.⁸⁵

3.75 Despite this, a number of submissions and witnesses emphasised the importance of the copper network in rural and regional areas for providing voice services. Ms Sonia O'Keefe, Chair, Rural Affairs Committee, NSW Farmers, explained that the copper landline service is the primary means of communications for most farming businesses and families:

There are a lot of people who live on farms and in rural and regional communities who don't have mobile phones and don't access the internet, so the landline is their primary means of communication. But also our mobile coverage is mobile because sometimes it's there and sometimes it's not. So it is still the go-to form of your day-to-day communication. A lot of the recording and accounting of farm businesses is done over the internet, but a lot of, 'What am I doing today?' and, 'How do I organise my day?' and, 'How do I go about progressing my business?' is still done over voice, and it is still done over that copper landline. So, until we have a mobile service or some form of voice service that provides a similar service, it would be literally cutting us off at the knees as far as communications go.⁸⁶

3.76 In its submission, Australian Private Networks detailed the latency issues which can affect voice services on the satellite:

This latency is of the order of half a second. This delay has virtually no effect on usual internet usage such as browsing and streaming but is a real problem for "gamers" competing against others. The latency can also affect telephone services using the VOIP protocol (Voice Over Internet Protocol) and discourages customers from taking up this option. For example, 10.4% of customers with the Fixed Wireless service also have a VOIP phone service but only 4.1% of the satellite customers [have VOIP].⁸⁷

3.77 Ms O'Keefe noted that nbn had acknowledged that the satellite service is not suitable for voice communications:

[NSW Farmers] has spoken to NBN about the possibility of providing voice over satellite, and they say that the satellite is just too high orbit. They were not designed to provide voice. They do think that they can do that over the

85 nbn co website, *Services that will be affected*, available at: <https://www1.nbnco.com.au/residential/learn/device-compatibility/services-that-will-be-switched-off.html> (accessed 21 August 2018).

86 *Committee Hansard*, 4 June 2018, pp. 17–18.

87 Australian Private Networks, *Submission 8*, p. 2.

fixed line. If you've got wireless, quite often there is another one of the big telcos who will be providing wireless, and that is your mobile, so you have voice there. So in that satellite footprint particularly we are really concerned about maintaining that copper landline.⁸⁸

3.78 In its submission, NSW Farmers recommended that the Government build into the future Universal Service Guarantee the cost of retaining and augmenting the current copper line infrastructure in regional, rural and remote areas in Australia as a long term solution for the provision of voice services.⁸⁹

3.79 BIRRR noted that consumers are concerned about losing their landline once they get an nbn connection, even in the satellite and fixed wireless areas where the copper network is being retained:

A good proportion of the elderly population only want to keep a landline and become disoriented and confused when they see marketing material stating that ALL landlines will be switched off in their area in 18 months' time. Suppliers need to make marketing material a lot clearer that this only applies if you are on an nbn Fixed Line connection.⁹⁰

3.80 ACCAN expressed concern that consumers who are currently served by ADSL or copper phone services would find these services no longer available after they move to fixed wireless or satellite services:

Consumers using nbn services have contacted us who find that they wanted to revert or add a copper phone service for the security for an elderly relative who is now living with them, only to find these services are no longer available to them.⁹¹

3.81 At the public hearing in Canberra, Ms Corbin, ACCAN, set out in detail that organisation's concerns in relation to the ADSL network:

The future of ADSL service is something also of concern, because ADSL and copper services are very important to regional Australia, and their future is uncertain. However, it appears that Telstra is slowly removing the option of ADSL service and also copper voice services in fixed wireless areas...while Telstra is required to provide a voice service as part of the Universal Service Obligation, it is not required to provide data or ADSL. As a result, consumers are falling through the gaps between the current USO arrangement and Telstra's commercial interests. There are many communities in areas in the fringe of the fibre-to-the-node footprint that are currently using ADSL. These areas are likely to be switched over to the NBN satellite once ADSL services are withdrawn. For these consumers, the switch to NBN will represent a degradation of service. While the future of copper is being considered in the context of the Universal Service

88 *Committee Hansard*, 4 June 2018, p. 18. See also: BIRRR, *Submission 14*, p. 18; Western Australian Government, *Submission 20*, p. 15.

89 NSW Farmers, *Submission 15*, p. 17.

90 BIRRR, *Submission 14*, p. 14.

91 ACCAN, *Submission 12*, p. 11.

Obligation and the transition to the Universal Service Guarantee, there is no requirement for Telstra to reconnect consumers to its network or offer ADSL services.⁹²

3.82 Ms Corbin continued:

...the current design of the NBN fixed wireless and satellite...relies on ADSL services to provide the main broadband services for people not switching to the NBN. If NBN technology is unable to meet the needs of all these consumers and Telstra removes the availability of ADSL, there could be hundreds of thousands of households who lose services or have to rely on expensive alternatives. The government, we believe, needs to take the lead in developing an ADSL future service strategy which examines and addresses these issues, and this must be done in consultation with consumers so the community can have confidence in how their services will be delivered in the future.⁹³

Other strategies for the delivery of broadband to rural and regional Australia

3.83 Submissions noted a proliferation of alternative arrangements to meet the ever growing broadband needs of regional, rural and remote Australia, including strategic partnerships, independent wireless internet service providers (WISPs), and organisations building their own networks or providing third parties access to their existing broadband networks.

3.84 Ms Georgie Somerset, Chair, Telecommunications Committee, AgForce, Queensland, (AgForce), advised the committee that she envisaged regional telecommunications will be a complex web of mixed technology solutions into the future so it is necessary to ensure legislation enables and does not detract from innovation, entrepreneurship and community based solutions:

Often, these [alternative] providers offer affordable and cost-effective connectivity, and the policy settings should not push them out in favour of larger providers. We recommend that the funding arrangements for backhaul be reviewed and that funding arrangements are better suited to regional communities.⁹⁴

3.85 The NT Government advised that it has been proactive in the provision of telecommunications infrastructure to remote communities. The NT Government currently has a co-investment agreement with Telstra in a three-year, \$30 million program to provide mobile phone and fixed line broadband coverage to 17 remote communities in the NT:

The program follows three prior successful jointly-funded remote telecommunications infrastructure programs since 2009 which, in total,

92 *Committee Hansard*, 4 June 2018, p. 24.

93 *Committee Hansard*, 4 June 2018, p. 24.

94 *Committee Hansard*, 14 June 2018, p. 52.

have successfully delivered mobile telephone and/or fixed broadband services to around 23,000 residents, or 10% of the NT population.⁹⁵

3.86 The Queensland Government has indicated its intention to undertake due diligence assessment of the viability of providing access to spare capacity in the Queensland Government's optical fibre network to improve digital connection for Queenslanders.⁹⁶

3.87 In a similar vein, to fill emerging gaps in the NBN service delivery, the WA Government advised that it is undertaking a study to identify business models and co-investment opportunities with the State government to enable the provision of enterprise grade digital connectivity in regional Western Australia.⁹⁷

3.88 The WSC comprising six towns and covering approximately 12 380 square kilometres in north-west New South Wales, is also exploring the services of alternative providers of the NBN. The Council has identified a business with a long history in telecommunications which has a proven record in the installation of effective alternative systems, and which has successfully assisted other councils.⁹⁸

3.89 Communications and Finance noted that Australia has an open and competitive telecommunications market in which different providers are free to supply services and roll out networks in response to commercial opportunities, subject to regulatory requirements. Communications and Finance observed that mobile broadband services are an important component to consider in servicing the telecommunications needs of rural and regional Australians.⁹⁹

Wireless Internet Service Providers

3.90 A number of submissions referred to services provided WISPs. For example, the WA Government observed:

There are, in many areas of regional Australia, viable alternatives provided by wireless internet service providers (WISPs) that offer internet access services to businesses, and in some cases consumers, that are at higher bandwidths than available from the NBN Co and with much more consistent bandwidths.¹⁰⁰

3.91 The WA Government submission continued:

Many WISPs are small operators in regional and rural Australia providing services to businesses and homes in their immediate vicinity, and offering excellent grade bandwidths and service beyond what the NBN Co can offer.

95 Northern Territory Government, *Submission 2*, p. 3.

96 Queensland Government, *Submission 13*, p. 3.

97 Western Australian Government, *Submission 20*, p. 4.

98 Warrumbungle Shire Council, *Submission 9*, p. 4.

99 Department of Communications and the Arts and the Department of Finance, *Submission 10*, pp. 1–2; See also, BIRRR, *Submission 14*, p. 20.

100 Western Australian Government, *Submission 20*, p. 14.

They implement this by using fixed point-to-point and point-to-multipoint microwave technology in both apparatus licensed and class-licensed spectrum for their 'last mile' connectivity.¹⁰¹

3.92 Similarly, the Queensland Government stated that, while it recognises nbn as the primary operator in delivering broadband digital connectivity, it is encouraged to see the emergence of independent operators to provide improved and alternative digital connectivity technology choices to rural and regional Queensland:

In many cases, these operators have been able to gain significant presence in areas that are scheduled to receive NBN fixed line or wireless services and are yet to receive them, or areas that will not be receiving either of these services and will become reliant on Sky Muster satellite services.¹⁰²

3.93 At the public hearing in Brisbane, the committee heard from Mr Michael Hoggett, CEO of Kooralbyn Community Broadband who explained how his company had entered the market by utilising an unlicensed spectrum band to deliver fixed wireless services to his local community.¹⁰³

3.94 By contrast, BIRRR observed that the appearance of WISPs in areas underserved by nbn will result in fewer customers and reduced profits for nbn, and further confusion for regional, rural and remote consumers as to the technology available.¹⁰⁴

3.95 Ms McDougall of NSW Farmers offered a word of warning on the risks to consumers signing up to WISPs working in the unregulated wireless spectrum:

Spectrum is not an easy topic to understand. Our fear is that, for members who are going onto those smaller providers, those providers already have a limited amount of spectrum, and, when that is re-auctioned in several years time, it could be that Vodafone, Telstra, Optus or TPG then do not provide further spectrum down the line to those smaller retail providers, which means that our members then will have to migrate to a completely new service with either different technology or another migration process. We know of more than several—hundreds of members—who have gone a different route, but they probably don't understand spectrum yet.¹⁰⁵

3.96 Mr Morrow indicated the nbn's support for WISPs entering the market, acknowledging that:

we've always said we welcome even other satellite services that can go in and offer capacity that deloads our satellites. We're quite open to that.¹⁰⁶

3.97 Mr Morrow advised the committee that WISPs tend to be located in areas which are 'expensive uneconomical areas' to begin with. Mr Morrow stated:

101 Western Australian Government, *Submission 20*, p. 14.

102 Queensland Government, *Submission 13*, p. 11.

103 *Committee Hansard*, 14 June 2018, p. 6.

104 BIRRR, *Submission 14*, p. 22.

105 *Committee Hansard*, 4 June 2018, p. 17.

106 *Committee Hansard*, 4 June 2018, p. 61.

What you'll see is a tiny little bit of cherry picking, where a tower already exists by a current model carrier, that they can just add and say, 'I'll bypass NBN in these particular areas.' Quite frankly, that doesn't hurt us that helps us, in the way that this funding model works...

3.98 Mr Morrow concurred with the view that the WISPs are helpful to the nbn in shifting to an alternative provider what for nbn is a non-commercial undertaking but for WISPs is of a high commercial value. Furthermore, Mr Morrow said that the nbn would welcome alternative satellite service providers capable of offering capacity to reduce the loads on Sky Muster satellites.¹⁰⁷

3.99 Communications and Finance stated that Australia has an open and competitive telecommunications market in which different providers are free to supply services and rollout networks in response to commercial opportunities, subject to regulatory requirements.¹⁰⁸ However, the joint submission noted that the 3.6 Gigahertz (GHz) spectrum re-allocation will provide opportunities for Australians to access new broadband services, including 5G. The committee notes that these 5G services will not be rolled out to regional Australia for some time and in the interim, the potential interruption or loss of broadband provided by WISPs could disadvantage regional Australia.

3.100 Communications and Finance acknowledged that the Government's decision to re-allocate the 3.6 GHz band for spectrum licensing has led to concerns from some incumbent licensees, including wireless internet service providers operating in regional areas.¹⁰⁹

3.101 The committee notes the importance of WISPs in filling a gap in broadband services provided by nbn and welcomes the commitment of the Government to ensuring the ACMA works with wireless providers to ensure the continuity of these services.

The convergence of 5G and NBN

3.102 Submitters and witnesses commented on the rollout of a 5G mobile broadband network in Australia, and whether that might be complementary to, or in competition with the NBN.

3.103 Mr Rohan MacMahon, Principal, Wollemi Consulting Limited (New Zealand), noted that Australia was in the process of planning an upgrade from 4G to 5G:

I would say that fixed services and mobile services are generally complementary. Most people will want to have a broadband service in their

107 *Committee Hansard*, 4 June 2018, pp. 60–61. See also: BIRRR, *Submission 14*, p. 20 which notes the lack of mobile coverage for Sky Muster consumers' results in a lack alternative providers for satellite.

108 Department of Communication and the Arts and the Department of Finance, *Submission 10*, Attachment B, p. 2.

109 Department of Communication and the Arts and the Department of Finance, *Submission 10*, Attachment B, p. 3.

home or business as well as mobility that will help them when they're out on the road. But the two are also substitutional at the boundary. There is a boundary point between the two.¹¹⁰

3.104 Mr John de Ridder, Principal, Deridder Consulting, noted the convergence of mobile and fixed wireless, and stated that 5G wireless in the last mile is a very effective option:

It's inevitable, I think, that you'll see more and more that [mobile and fixed wireless are] converging. The mobile networks are pushing fibre out to connect the macro cells—the towers—but at the same time you're going to see mobile broadband as an access mechanism. They're moving towards each other more and more.¹¹¹

3.105 Mr Ian Martin, Senior Telecommunications Analyst, New Street Research, stated that 'it's not black and white' that the 5G network will complement the NBN:

There are a lot of areas where it will be complementary, but there is an increase in the footprint where 5G will be a competitor to NBN and will contest the market access. It won't be 15 per cent; it will be, in our view, something in the order of 30 to 40 per cent of premises which will be able to take the broadband over a wireless network.¹¹²

3.106 NSW Farmers stated that the rollout of 5G would be a consideration for nbn in regards to competition and retaining customers:

While it is likely that regional and remote consumers will be outside the future 5G network footprint in the early stages of its implementation, it has the ability to disrupt nbn's current offerings and provide consumers the decision to choose alternatives to nbn.¹¹³

3.107 In a joint submission, Communications and Finance highlighted the role of mobile broadband services as an important component to consider in servicing the telecommunications needs of rural and regional Australians, noting that mobile network operators have made significant investments in improving mobile coverage and competition in regional Australia.¹¹⁴

3.108 Mr Rue considered the 5G technology is still yet to be commercialised, and there are many years before the full impact of 5G is seen. Mr Rue stated that to date there has been a 75 per cent take up rate. As to what effect 5G could have on nbn, Mr Rue said:

110 *Committee Hansard*, 4 June 2018, p. 6. See also: Professor Rodney Tucker, private capacity, *Committee Hansard*, 4 June 2018, p. 12.

111 *Committee Hansard*, 14 June 2018, p. 21.

112 *Committee Hansard*, 5 June 2018, p. 11.

113 NSW Farmers, *Submission 15*, p. 18

114 Department of Communications and the Arts and the Department of Finance, *Submission 10*, p. 3.

In part, the answer to that is obviously: if you've got fewer users, you've got less revenue. That's obvious. But the question is also: for how long? As data consumption continues to grow, and as applications continue to grow, I've got absolutely no doubt that our network is built for the future and the economic model absolutely stands up.¹¹⁵

Chapter 4

Committee view and recommendations

4.1 The NBN is vital to the economic development and social participation of Australians living in rural and regional communities. For those communities, the NBN provides the digital connectivity necessary to allow them to engage in education, access government services and participate in the global marketplace.

4.2 The rollout of the NBN in non-metropolitan areas is now 80 per cent complete and, in the committee's view, the last 12 months has seen an improvement in some aspects of NBN services in rural and regional Australia and new challenges emerge in other areas. However ongoing issues with the reliability of satellite and congestion in fixed wireless services is also a concern.

4.3 It is also a concern that there has been less deployment of the faster and more reliable FTTC fixed line technology in regional Australia, with FTTC deployment being concentrated in metropolitan areas.

4.4 The challenges of the nbn rollout in rural and regional Australia include the high costs required to meet geographical distribution of premises. Evidence was provided that nbn is expected to incur losses of around \$9.8 billion (net present value) out to 2040, or between \$700 to \$800 million per annum. The Department of Communications and the Arts undertook this modelling in 2015.

4.5 Increased data caps on Sky Muster satellite services have contributed to better consumer experiences.

4.6 While these are all important markers of progress, it is not to deny that there is still work to be done to provide communities in rural and regional Australia with very fast broadband at affordable prices. On this point, the committee notes ongoing community concerns that some consumers in regional Australia have the option of purchasing multiple services to meet their connectivity needs but this raises their broadband costs compared to consumers in the fixed line footprint.

Satellite service

4.7 The committee recognises that Sky Muster has an important place in the range of nbn technology options, most particularly for remote locations where there is no other option, but also as a cost-effective means of providing NBN to geographically difficult or peri-urban locations.

4.8 Witnesses identified a number of reasons contributing to a hesitancy to transfer to Sky Muster where consumers are satisfied with their current ADSL service, or have had a negative experience with the Interim Satellite Service. It is also apparent to the committee that retail service providers (RSPs) and nbn could be doing more to

provide consumers with specific information on the availability of satellite services and promoting satellite services.

4.9 The committee also heard evidence that the introduction of 'Layer 3' technology could significantly increase the amount of data for Sky Muster customers. Having 'Layer 3' visibility would enable nbn to improve customer experience and better manage bandwidth capacity.

Recommendation 1

4.10 The committee recommends that nbn materially expand its 'Layer 3' capabilities to better utilise satellite capacity and improve the customer experience.

Recommendation 2

4.11 The committee recommends nbn use expanded 'Layer 3' capabilities to deliver a significant increase to monthly data allowances for households and businesses on Sky Muster satellite in conjunction with prudent traffic management during peak periods.

Recommendation 3

4.12 The committee recommends nbn work proactively with retail service providers to promote the take-up of Sky Muster services in areas where no alternative connectivity options exist.

4.13 The committee notes that nbn has yet to deliver the Sky Muster Business Enterprise Plans sought by large regional and rural agribusinesses, which was promised for December 2017. The committee recommends nbn address the release of these plans as a matter of urgency.

Recommendation 4

4.14 The committee recommends nbn release the Sky Muster Business Enterprise Plan as a matter of urgency.

4.15 The committee also heard evidence of frustration with data restrictions on Sky Muster, despite the doubling of allowances in 2017. This particularly disadvantages those in remote parts of Australia with no alternative option.

Recommendation 5

4.16 The Government should provide the committee with data around how many premises which previously or currently have an ADSL connection fall into the Sky Muster footprint, so the committee can assess concerns raised about the future arrangements for ADSL services.

Fixed Wireless services

4.17 By far the most common complaint to the committee in relation to fixed wireless services was that of congestion on towers. Consumers on fixed wireless services are subject to peak hour congestion because the tower capacity is a shared resource across many users and data use is increasing rapidly.

4.18 The fixed wireless products have been designed to replicate most of the product offerings on the fixed line network. The committee notes that adopting different upload and download ratios, more tailored to consumer behaviour on wireless networks, could potentially improve the peak hour experience for consumers.

Recommendation 6

4.19 The committee recommends nbn, in light of increasing congestion over its fixed-wireless network, consider moving away from replicating wholesale fixed-line product tiers on fixed-wireless if that is shown to deliver sub-optimal outcomes for consumers. In considering this, nbn could review the structure of its fixed-wireless wholesale offerings with the aim to optimise spectrum use towards delivering the best possible consumer experience.

Recommendation 7

4.20 The committee recommends that nbn examine the merits of expanding its 'Layer 3' capabilities to better utilise fixed wireless capacity and improve customer experience during peak hours.

4.21 nbn contends that it is delivering at least six megabits per second during the busiest period to 94 per cent of cells, and that the number of congested towers is just six per cent. However, it was put to the committee that this underestimates the extent of the problem. The committee notes that data consumption is expected to grow by 30 per cent per annum.

4.22 The committee understands that there is ongoing work by nbn to upgrade fixed wireless towers so that they offer a minimum of 6 Mbps to address the identified congestion and that this work is anticipated to be completed by early 2019. Mr Morrow also indicated the cost of providing greater backhaul capacity was a factor in the withdrawal of the 100 Mbps fixed wireless product in 2018.

4.23 The committee heard concerns that nbn's fixed wireless upgrade to 6 Mbps minimum may not meet consumer expectations or future growth in demand.

Recommendation 8

4.24 The committee recommends that non-NBN carriers explore opportunities with nbn, where applicable and technically feasible, to provide cost effective access to existing fibre backhaul with the aim to reduce current and future congestion on fixed-wireless cells.

4.25 In the committee's view, consumers would benefit from greater transparency in relation to how nbn is identifying and addressing the congestion. To this end, the committee supports the proposal by the Australian Competition and Consumer Commission (ACCC) that nbn commence dashboard reporting on the number of cells that do not meet the six megabit per second benchmark.

4.26 The committee acknowledges consumer concerns about cell congestion. The committee considers the nbn dashboard should be extended to provide a search engine where consumers can obtain precise information about the cell performance as it affects their household.

4.27 The committee notes the calls for RSPs to cease selling services on congested towers. It is the committee's view, however, that as a first step, nbn should provide RSPs with more information on congested cells and the likely timeframes for remedial work on those cells, such that RSPs are better able to advise customers seeking to purchase fixed wireless services.

Recommendation 9

4.28 The committee recommends that nbn include as part of its Monthly Progress Reports on its website reporting on the number of cells in the fixed wireless network which do not meet the six megabit per second metric.

Recommendation 10

4.29 The committee recommends nbn provide retail service providers with clear information on congested locations together with advice on the proposed remedial program.

Recommendation 11

4.30 The committee recommends that nbn in consultation with RSPs, develops a policy to govern the addition of new customer sign-ups on highly congested fixed wireless cells.

Alternate broadband strategies

4.31 The committee notes the evidence of nbn, NSW Farmers and others of the importance to regional Australians of wireless internet service providers (WISPs) who supply fixed wireless broadband in niche markets in the nbn satellite footprint. Evidence was given that the 3.6Ghz spectrum currently used by WISPs will shortly be auctioned to clear the way for the 5G rollout and that the ACMA was working with WISPs on identifying alternate spectrum so these services can continue.

Recommendation 12

4.32 The committee recommends that the Government ensures that regional Australians are not disadvantaged by the auction of the 3.6Ghz spectrum currently used by WISPs and that alternate, equivalent spectrum is identified for these services.

Technology mapping

4.33 The NBN is a multi-technology-mix, where the technology delivered is that which should be best matched to the area. However, there is no transparency around nbn's decisions regarding technology mapping and evidence to the committee showed that there is continuing frustration in communities which are mapped for a particular technology, and subsequently are offered NBN services via different technology.

4.34 The committee notes that where there is overlap between the fixed wireless and satellite footprints in some cases it is possible for this to be changed so that these customers can move from satellite to fixed wireless. The committee believes that nbn could do more to assist consumers with this.

Recommendation 13

4.35 nbn should provide consumers mapped for satellite services with better information about options for moving to fixed wireless where an adequate signal exists.

Recommendation 14

4.36 The committee recommends that nbn undertakes an assessment of those premises mapped for satellite that are adjacent to fixed wireless services and reports on how many premises allocated to satellite are capable of receiving a fixed wireless service at a level that meets the Statement of Expectations.

4.37 Concern was raised about the perceived expansion of the satellite footprint that will see a larger percentage of premises in Australia rely on satellite for broadband services than was first identified.

4.38 There was significant concerns expressed to the committee that the rollout of the NBN is not leveraging off existing fibre infrastructure to deliver non-satellite based services. This is a particular issue in the Northern Territory where nearly 30 per cent of the population is reliant on satellite and half of those do not have access to mobile communications.

Recommendation 15

4.39 The committee recommends that nbn works with the Northern Territory Government and Telstra to investigate how existing optic fibre can be used to expand the fixed line and fixed wireless footprint in the Northern Territory and other relevant areas.

4.40 It is of concern to the committee that existing fibre infrastructure has not been mapped in all States. Better mapping of existing infrastructure will be useful for considering how to improve regional connectivity in the future.

Recommendation 16

4.41 The committee recommends that the government and ACCC should examine the feasibility of undertaking an audit into fibre infrastructure across Australia and making the geospatial data publicly available where it does not compromise national security or other legitimate interests.

4.42 The committee notes that the vast majority of regional premises will, in fact, receive either fixed line or fixed wireless services.

4.43 In the committee's view, nbn can better improve its engagement with stakeholders and communities and its decisions on technology rollout.

Recommendation 17

4.44 The committee recommends nbn, particularly through nbn local, engage more closely with rural and regional communities to explain the selection of technology to ensure communities have a greater visibility of nbn's decision processes and in relevant areas of the satellite footprint, explain to customers how to check for potential access to fixed wireless.

Recommendation 18

4.45 The committee recommends that nbn should make geospatial data for each technology footprint publicly available on the national map.gov.au website.

Regional Broadband Levy

4.46 The committee is acutely aware that one of the key parameters of the Statement of Expectations is that the NBN rolled out 'at least cost to taxpayers'. On this point the committee notes evidence that the fixed wireless and satellite infrastructure is required to be subsidised by the fixed line network and that according to 2015 modelling the annual internal cross subsidy has been estimated at between \$700 and \$800 million upon rollout completion.

4.47 Since the time of the initial modelling, the cost of fixed wireless deployment has increased by a material amount. The 2019 NBN Corporate Plan revealed an additional \$800 million in capital expenditure for the fixed wireless network.

4.48 The committee notes the concerns of the ACCC and the Productivity Commission in relation to the design and sustainability of the proposed Regional Broadband Scheme (RBS) levy.

4.49 The committee notes the revenue raised by the proposed RBS levy is immaterial to the overall challenges facing the business case for the multi-technology mix or the cost of regional service delivery.

4.50 The committee is of the view that the most useful policy function the RBS levy can serve is to establish a price signal that deters the inefficient duplication of

fixed-line infrastructure, deters cherry-picking of profitable parts of the NBN footprint, and establishes a more level playing field for nbn.

Recommendation 19

4.51 The committee recommends the Government update its RBS levy modelling to account for the cost increases that have occurred since the original modelling was undertaken in 2015. The Government should report to the committee within two weeks of the tabling of this Report to advise what the updated levy amount is.

Recommendation 20

4.52 Following the provision of updated modelling, the committee recommends that the Parliament pass the Telecommunications Legislation Amendment (Competition and Consumer) Bill 2018, and amend the Telecommunications (Regional Broadband Scheme) Charge Bill 2018 in recognition that the RBS levy does not constitute a sustainable funding mechanism, and is better re-purposed as a level playing field competition measure.

Hon. Jane Prentice MP

Chairman

Appendix 1

Submissions and additional information received by the committee

Submissions

1. Australian National Audit Office
2. Northern Territory Government
3. Chamber of Commerce and Industry Queensland
4. Aussie Broadband
5. Coonabarabran Business Centre & Computer Hospital
6. Viasat
7. NSW Business Chamber
8. Australian Private Networks
9. Warrumbungle Shire Council
10. Department of Communications and the Arts and Department of Finance
11. Coutts Communications
12. Australian Communications Consumer Action Network (ACCAN)
13. Queensland Government
14. Better Internet for Rural, Regional & Remote Australia
15. NSW Farmers
16. Kooralbyn Community Broadband Pty Ltd (KCB)
17. Mr Edward Nelson
18. Ms Lorena Owens
19. Mr Ben Sargeant
20. Western Australia Department of Premier and Cabinet
21. Mr Jim Straker
22. Mr Derek White

Additional Information

- Correspondence from Mr Chris Lamont, NSW Business Chamber, in relation to evidence provided at the committees public hearing in Sydney on 14 June 2018, received 6 June 2018.
- Additional information provided by Mr John de Ridder, received 21 June 2018.

Answers to Questions taken on Notice

- NBN Co., answers to questions taken on notice, received 15 June 2018
- NSW Business Chamber, answers to questions taken on notice, received 20 June 2018
- NSW Farmers, answers to questions taken on notice, received 21 June 2018
- Department of Finance, answers to questions taken on notice, received 6 July 2018
- Viasat, answers to questions taken on notice, received 6 July 2018.
- Better Internet for Rural, Regional & Remote Australia (BIRRR), answers to questions taken on notice, received 11 July 2018
- Department of Communications and the Arts, answers to questions 8 and 9 taken on notice, received 19 July 2018
- Department of Communications and the Arts, answers to questions 1 -7 and question 10 taken on notice, received 10 August 2018
- nbn co., answers to questions 1-6 taken on notice, received 10 August 2018
- nbn co, answer to question 7 taken on notice, received 10 August 2018.
- nbn co., answer to question 8 taken on notice received 10 August 2018.
- nbn co., answers to question 1 taken on notice, received 19 October 2018
- nbn co., answers to question 2 taken on notice, received 19 October 2018
- nbn co., answers to question 3 taken on notice, received 19 October 2018
- nbn co., answers to question 4 taken on notice, received 19 October 2018
- nbn co., answers to question 5 taken on notice, received 19 October 2018
- nbn co., answers to question 6 taken on notice, received 19 October 2018
- nbn co., answers to question 7 taken on notice, received 19 October 2018
- nbn co., answers to question 8 taken on notice, received 19 October 2018
- nbn co., answers to question 9 taken on notice, received 19 October 2018
- nbn co., answers to question 10 taken on notice, received 19 October 2018
- nbn co., answers to question 11 taken on notice, received 19 October 2018
- nbn co., answers to question 12 taken on notice, received 19 October 2018
- nbn co., answers to question 13 taken on notice, received 19 October 2018
- nbn co., answers to question 14 taken on notice, received 19 October 2018
- nbn co., answers to question 15 taken on notice, received 19 October 2018

- nbn co., answers to question 16 taken on notice, received 19 October 2018
- nbn co., answers to question 17 taken on notice, received 19 October 2018
- nbn co., answers to question 18 taken on notice, received 19 October 2018
- nbn co., answers to question 19 taken on notice, received 19 October 2018
- nbn co., answers to question 20 taken on notice, received 19 October 2018
- nbn co., answers to question 21 taken on notice, received 19 October 2018
- nbn co., answers to question 22 taken on notice, received 19 October 2018
- nbn co., answers to question 23 taken on notice, received 19 October 2018
- nbn co., answers to question 24 taken on notice, received 19 October 2018
- nbn co., answers to question 25 taken on notice, received 19 October 2018
- nbn co., answers to question 26 taken on notice, received 19 October 2018
- nbn co., answers to question 27 taken on notice, received 19 October 2018
- nbn co., answers to question 28 taken on notice, received 19 October 2018
- nbn co., answers to question 29 taken on notice, received 19 October 2018
- nbn co., answers to question 30 taken on notice, received 19 October 2018
- nbn co., answers to question 31 taken on notice, received 19 October 2018
- nbn co., answers to question 32 taken on notice, received 19 October 2018
- Department of Communications and the Arts, answers to question 1 taken on notice, received 19 October 2018
- Department of Communications and the Arts, answers to question 2 taken on notice, received 19 October 2018
- Department of Communications and the Arts, answers to question 3 taken on notice, received 19 October 2018

Appendix 2

Public Hearings

Monday, 4 June 2018
Portside Centre
Sydney, NSW

Witnesses

Australian Communications Consumer Action Network

CORBIN, Ms Teresa, Chief Executive Officer

LAWRENCE, Ms Una, Director of Policy

Better Internet for Rural, Regional & Remote Australia

HAY, Dr Rachel, Volunteer Data Analyst,

SPARROW, Mrs Kristy, Chief Admin & Co-Founder

MacMAHON, Mr Rohan

nbn co

MORROW, Mr Bill, Chief Executive Officer

RUE, Mr Stephen, Chief Financial Officer

NSW Business Chamber

LAMONT, Mr Chris, Director, Policy & Advocacy

MILLAR, Mr Robert, Policy Manager, Infrastructure

NSW Farmers Association

McDOUGALL, Ms Isabella, Policy Adviser

O'KEEFE, Ms Sonia, Chair, Rural Affairs Committee

TUCKER, Professor Rodney

Warrumbungle Shire Council

BELL, Aileen, Manager, Economic Development and Tourism

Tuesday, 5 June 2018
Stamford Plaza
Melbourne, VIC

Witnesses

Aussie Broadband

BRITT, Mr Phillip, Managing Director

Australian Competition and Consumer Commission

HARDING, Mr Scott, Director, NBN and Pricing Coordination,

RIORDAN, Mr Sean, General Manager, Industry Structure and Compliance Branch

Australian Private Networks

BUNDROCK, Mr Tony, Chairman

GREGORY, Associate Professor Mark

Internet Australia

WESTLEY, Dr Paul, Chair

GERMAINE, Ms Sae Ra, Vice-Chair

New Street Research

MARTIN, Mr Ian, Senior Telecommunications Analyst

Viasat

GIRVAN, Mr Peter, Asia-Pacific Vice-President

Thursday, 14 June 2018
Queensland Parliament House
Brisbane, QLD

Witnesses

AgForce Queensland Farmers (AgForce)

SOMERSET, Ms Georgie, Chair, AgForce Telecommunications Committee

WHALE, Mr Zachary, Grains Policy Director

Central Queensland University

PIDGEON, Mr Roy, Chief Information and Digital Officer

Communications Chambers Ltd

KENNY, Mr Robert, Director

Coonabarabran Business Centre & Computer Hospital

TURNER, Mr Stephen, Owner

COUTTS, Prof. Reginald**de Ridder Consulting Pty Ltd**

de RIDDER, Mr John, Principal

Department of Communications and the Arts

WINDEYER, Mr Richard, Acting Deputy Secretary, Infrastructure and Consumer Division

PATERSON, Mr Lachlann, Acting First Assistant Secretary, Infrastructure and Consumer Division

MADSEN, Mr Andrew, Assistant Secretary, Broadband Implementation Branch, Infrastructure and Consumer Division

ASHURST, Mr Jason, Acting Assistant Secretary, Regional Deployment Branch Infrastructure and Consumer Division

Department of Corporate and Information Services, Northern Territory

ROBINSON, Ms Kathleen, Chief Executive

COOKE, Mr Douglas, Senior Director, Digital Policy and Telecommunications

Department of Finance

JAGGERS, Mr Andrew, Acting Deputy Secretary, Commercial and Government Services,

Department of Housing and Public Works, Queensland

SPINA, Mr Andrew, Assistant Director-General, Digital Capability, Information and Transaction Based Services

IVES, Mr David, Director, Digital Economy Development

Kooralbyn Community Broadband

HOGGETT, Mr Michael, Chief Executive Officer

Rural Doctors Association of Queensland Inc

MOSS, Ms Margaret, Executive Officer

Wednesday, 15 August 2018
2SI, Parliament House
Canberra, ACT

Witnesses

nbn co

RUE, Stephen, Chief Financial Officer

RYAN, Mr Peter, Chief Network Engineering Officer

Department of Communications and the Arts

MRDAK, Mr Mike, Secretary,

WINDEYER, Mr Richard, Deputy Secretary

WILLIAMS, Ms Nadine, First Assistant Secretary, Infrastructure and Consumer
Division

MADSEN, Mr Andrew, Assistant Secretary, Broadband Implementation Branch,