Chapter 8

Opportunities for the NBN to provide economic and social benefits

Introduction

8.1   In nbn's 2015-16 Annual Report, the Chairman and Chief Executive Officer's message stated:

> Our purpose remains to connect all Australia and bridge the digital divide, and at 30 June 2016, 70 per cent of the rollout to date has been in non-metropolitan and regional Australia.[1]

8.2   Given the extent of the rollout in regional Australia, and as noted in Chapter 1, the committee undertook its public hearing program with the specific intent of taking the inquiry outside of major metropolitan areas and gathering evidence in regional Australia. During the course of the inquiry, the committee received evidence of the opportunities the NBN is providing for economic and social benefits, particularly for communities located outside the major metropolitan areas. The committee focussed on the potential opportunities in economic growth and innovation, telehealth, digital inclusion and education.

8.3   The committee also received evidence that showed the NBN is delivering a service of significantly varied quality as a result of the uneven nature of the multi-technology mix and the apparent over-use of satellite broadband.

Opportunities for economic growth and innovation

8.4   The committee received substantial evidence highlighting the importance of good broadband services in promoting economic growth and innovation in regional Australia.

Agricultural applications

8.5   A number of submissions referred to the contribution of the agricultural sector to the Australian economy. For example, Better Internet for Rural, Regional and Remote Australia (BIRRR) noted:

> Figures recently released by the Australian Bureau of Statistics show that, in the three months to December 2016, agriculture contributed 0.5% to the nation's overall 1.1% economic growth. In addition, agricultural export earnings are expected to be around $48.7 billion in 2017-18. Considering agriculture experienced 27.6% growth in 2016 (compared with 4.6% in mining and a decline in both manufacturing and construction) it is safe to

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1   nbn, *Annual Report 2015-16*, p. 9.

say agriculture is an important sector that continues to underpin the overall economy.[2]

8.6   The submission from the NSW Farmers' Association emphasised the importance of telecommunications services to farmers:

> Access to reliable, affordable, quality telecommunications underpins the viability of these farming businesses across NSW, allowing farming families access to the business and education services as well as social connectivity. Access to improved telecommunications services in regional, rural and remote Australia is imperative to facilitate economic growth across agriculture through innovation in production, improved market access and enhanced consumer connectivity.[3]

8.7   Cotton Australia explained the extent to which telecommunications were essential business activity for their growers:

> …on any given day a cotton grower may rely on telecommunications to communicate with employees, to complete online banking, to participate in online trading, to monitor weather conditions, to receive real-time updates from on-farm sensors, to upload aerial drone footage and data, to remotely monitor and control irrigation systems, to access data from machinery and so much more.[4]

8.8   Submissions and evidence to the committee particularly noted the potential of precision technologies in agriculture and the importance of internet services to handle these applications.[5] At the public hearing in Townsville, Professor Ian Atkinson, of the e-Research Centre at James Cook University, appeared before the committee in a private capacity and detailed some of his work in this area:

> We have been doing precision agriculture—high precision beef cattle farming, where animals are tracked and weighed in real time on properties—and feeding that data back to farmers so that they have decision support systems and can move animals around these vast cattle stations in Northern Queensland and north Australia to improve profitability and land management. We are starting to do work in the cane industry to monitor run-off of sediments and fertilisers. Even in the wine industry in South Australia, some of our technology is being used to water and assess individual grapevines.[6]

8.9   Professor Atkinson continued, outlining the role of the NBN:

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2   Better Internet for Rural, Regional and Remote Australia, *Submission 101*, p. 23. See also: National Farmers' Federation, *Submission 45*, p. 1, which set out a projection for Australian agricultural to become a $100 billion industry by 2030.

3   NSW Farmers' Association, *Submission 104*, p. 4.

4   Cotton Australia, *Submission 46*, p. 2.

5   See, for example: Queensland Government, *Submission 21*, p. 32; and GrainGrowers, *Submission 82*, p. 2.

6   Professor Ian Atkinson, *Committee Hansard*, 7 April 2017, p. 18.

For many of these things, although we have access to very high bandwidth connections between universities, we are actually getting out into the real world. I could take you 120 kilometres west of here and it is really just dirt, and we want to actually take that land and make it productive for producers. Ubiquitous, accessible internet makes that available in ways that we simply could not do before. So it is with the NBN that we can start to imagine a new future for northern agriculture, where food is much more traceable and safe, and we can actually provide more value back to farmers.[7]

8.10   Some of these agricultural applications could be performed with quite small bandwidth, however, coverage is an issue:

We are dealing in locations which can be a hundred kilometres away from the nearest Telstra access point or mobile phone access point, so, although the data rates are quite low, it is actually the coverage and the ubiquity. In many cases we are putting in an NBN Sky Muster solution and then building our own networks out over those properties…You can think of them like a wi-fi network, but it is different technology, so it has a much longer range. Instead of them being around a house, you can spread them out for maybe 30 kilometres.[8]

8.11   Cotton Australia noted, however, that coverage was such an issue, that some growers were leasing office spaces in local towns to ensure they had access to reliable telecommunications services to conduct their businesses.[9]

Regional development

8.12   Mr Andrew Cottrill, from the Albury City Council, explained the role that the NBN had in stimulating regional growth and development:

…I really believe that great broadband speeds and great broadband services are critical to regional development. We are constantly behind the eight ball in regional areas, in terms of the tyranny of distance and access to services. The NBN is…a key facilitator of business investment. Whenever businesses look to invest in our city, there are always questions about: what is the broadband speed like; what are the services like; will they be available in this location? So it is very much front of mind for business investors in the region and it is critical that we have a great service.[10]

8.13   Conversely, Ms Robyn Downham, a representative from the Spencer community on the Central Coast, described for the committee the impact on that community of a lack of internet and mobile coverage:

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7   Professor Ian Atkinson, *Committee Hansard*, 7 April 2017, p. 18.

8   Professor Ian Atkinson, *Committee Hansard*, 7 April 2017, p. 20.

9   Cotton Australia, *Submission 46*, p. 2. See also: Mr Alex Green, Chief Executive Officer, Mansfield Shire Council, *Committee Hansard*, 20 April 2017, p. 34.

10   Mr Andrew Cottrill, Team Leader, Economic Development Team, Albury City Council, *Committee Hansard*, 20 April 2017, p. 7. See also: Mrs Lynette Craigie, President, Western Australian Local Government Association, *Proof Committee Hansard*, 17 July 2017, p. 2.

> On the business side of things with the area, there is [sic] hardly any business opportunities. Only a few people operate from home. From a social aspect, young families who love the area are discouraged to buy in the area because there is no school, no internet and no mobile coverage. There are a few people in the older demographics buying in the area because of a tree change. What we are finding is the community is becoming an ageing population. The average age is 45 to 50.[11]

8.14   The committee heard evidence of a number of examples of businesses based in regional areas benefiting from the rollout of the NBN and contributing to economic growth in those areas.

SafetyCulture, Townsville

8.15   At the public hearing in Townsville, the committee heard evidence from Mr Luke Anear, Chief Executive Officer, SafetyCulture, about the establishment and growth of that company and the iAuditor app, which it created.[12]

8.16   SafetyCulture started in 2004 and by 2011 had three staff. Between 2012 and 2017 the number of staff grew from three to 104, with an estimated 150 more positions to be added over the next 12 months. Mr Anear noted that the 104 jobs at SafteyCulture were 'high-skilled, high-paying jobs', in the local Townsville economy and also in other states of Australia.[13]

8.17   Mr Anear explained the significance of the NBN to the growth of his company:

> None of what we do would be possible if it were not for the NBN or a capability like that. Our company simply would not exist. We would not be able to build the teams and reach the customers we do without it. The situations we face where we have not had high-speed internet have crippled our capability completely.[14]

8.18   Mr Anear contrasted the operation of SafetyCulture's Townsville office with the Sydney office:

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11   Ms Robyn Downham, Advocate, Spencer community, *Proof Committee Hansard*, 2 August 2017, pp 49-50.

12   Mr Luke Anear, Chief Executive Officer, SafetyCulture, *Committee Hansard*, 7 April 2017, p. 17. iAuditor allows workers to conduct inspections and assessments to manage safety and quality in their workplaces. The app is used by 7,000 companies in 80 different countries. Customers use the products to do things such as inspect the London City Airport each day; inspect Starbucks stores across the world for quality, safety and condition the Royal Flying Doctor Service uses the app to inspect their aircrafts and equipment each day; researchers in Antarctica inspect the equipment they use; and as of February 2019 the products will be used on the International Space Station.

13   Mr Luke Anear, Chief Executive Officer, SafetyCulture, *Committee Hansard*, 7 April 2017, p. 17.

14   Mr Luke Anear, Chief Executive Officer, SafetyCulture, *Committee Hansard*, 7 April 2017, p. 17.

> Our teams consume roughly 80 hours a day of video, calls and conversations between each other and our customers. That is vital in being able to build and create teams of people to be able to solve complex problems. We now even design our offices so that they have single-person phone booth-style video offices as part of the way our offices are designed. We have spent up to $40,000 on our Sydney office to get fibre internet because we did not have the NBN down there although we did have it in Townsville. That would mean our communications would break down and we were not able to effectively maintain shared knowledge across teams and work together effectively.[15]

8.19   Mr Anear stated that the strengths of the NBN were the bandwidth available, which allowed for communicating of 'reasonably large amounts' of information without delay.[16] While the company's current 100 Mbps connection is currently sufficient, Mr Anear stated that this would not be enough going forward:

> Today we have a business that is built around people entering information into an app with their fingers, and taking photos. They do that 175 million times every month, and that is doubling every few months. In three years' time our business will not be that. Our business will be a combination of manual data entry and sensory data feeds, and combining other data sets that are coming from external sources, such as the telemetry inside a vehicle or a truck to know where its location is, or what the temperature is around it if you are moving produce and all those sorts of factors.

> So we need to move today from a fairly simple manual data-entry business into a much more automated data sensory feed that then has manual labour over the top of that. Our data requirements are probably less than five per cent of what they will be over the next three to five years. We are using 50 to 80 per cent of our hundred-megabit connection today. If we are not aiming towards 10 times that over the next—and perhaps we are a little on the extreme side compared to an everyday business—three to five years then we are going to start running into bottlenecks.[17]

BlinkMobile, Gosford

8.20   Mr Alan Williams, Chair and Chief Executive Officer of BlinkMobile, explained the work of his company to the committee:

> We are a software company based in Gosford. Just 12 of us create and sell a software platform that is used to develop and operate mobile and IOT [Internet of Things] based solutions that integrate into large corporate systems. So we have about 120 clients, many of which are large corporates in the government agencies. Agencies such as New South Wales SafeWork

15   Mr Luke Anear, Chief Executive Officer, SafetyCulture, *Committee Hansard*, 7 April 2017, p. 17.

16   Mr Luke Anear, Chief Executive Officer, SafetyCulture, *Committee Hansard*, 7 April 2017, p. 19.

17   Mr Luke Anear, Chief Executive Officer, SafetyCulture, *Committee Hansard*, 7 April 2017, pp 25-26.

and Food Authority use our software platform to deliver apps to their staff that are really transforming the way they work….

So how can 12 people based in Gosford compete with the likes of IBM, SAP, salesforce and other large corporations selling into large enterprises? The answer is to be specialised and cloud based.[18]

8.21   Mr Williams outlined the benefits of 'growing the ecosystem of similar businesses' on the Central Coast:

Well, it is the Silicon Valley effect. The more good people you get around, the more good ideas flow around. It is just like an eat street or Silicon Valley or anything like that. The more businesses of a certain type you get, you get the foment of ideas that happens. You get people bouncing off each other. We have a pretty small IT community here. You do not get people investing in IT. It is not a known place particularly for IT. We are trying to make it so. Investors follow where the ideas are. Getting start-ups going is what we need here. Obviously, we would love to have some big companies come here as well as anchor tenants into the area. We do not have a large IT company anywhere around here. A large IT company tends to spawn other ideas around it. People come out of that and do and new and exciting things. We would love that around here.[19]

8.22   Mr Williams also flagged speed issues as an impediment to this type of growth:

Transfer speeds are consistently good at about 100 megabits per second download, although faster rates would be useful at peak demand periods. So it is good, but we would always use more…

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… it is 100 in a company that has 12 active developers and a multimedia guy doing stuff. So it is easily consumed with that. For an individual working at home, in our world, where we are moving moderate amounts of data, 20 or 25 is probably okay. For somebody doing multimedia, it would not be okay. So it depends upon the business. Certainly if you are moving large amounts of video and things like that around, it would not be okay.[20]

Launtel, Launceston

8.23   At the committee's public hearing in Launceston, Mr Damien Ivereigh, Chief Executive Officer, Launtel, a Tasmanian retail service provider, spoke about the business potential arising from Launtel's gigabit product. Noting that the product was a business grade product, and not cheap, Mr Ivereigh gave the example of two local Launceston firms:

18   Mr Alan Williams, Chair and Chief Executive Officer, BlinkMobile, *Proof Committee Hansard*, 2 August 2017, p. 1.

19   Mr Alan Williams, Chair and Chief Executive Officer, BlinkMobile, *Proof Committee Hansard*, 2 August 2017, p. 6.

20   Mr Alan Williams, Chair and Chief Executive Officer, BlinkMobile, *Proof Committee Hansard*, 2 August 2017, pp 1 and 6. See also: Mr John Simpson*, Submission 173*, p. 1.

…I can talk about ARTAS, a local architecture firm, and Rare Innovation, an engineering company, who have both used the product. They tell me that, due to the integration they are able to have with each other—architects and engineers have to work quite closely together when they're designing a building, obviously—they have cut their time to work on a building from about six to eight weeks down to about two weeks, simply because they are able to work on the same design together using the same software, because they've both got high-speed connections.[21]

8.24   Mr Iverleigh drew on examples from overseas to support his view that a gigabit product had the potential to attract business to Launceston:

Absolutely I think they are going to come here. In fact, on the day we launched we had a call from a Singaporean engineering company, who basically told me that they were thinking of it, and now it's a no-brainer. ...Certainly the experience in places like Chattanooga, and Dingle in Ireland, is that within a few months businesses will start to relocate here. As for marketing this, as for letting the people on the mainland realise that it is available here, we could always do more. I'm talking to everybody who will listen, because I believe very much in what Tasmania as a state has to offer both Australia and the rest of the world. To my mind, this is just yet another reason why Tasmania is one of the best places in the world to live.[22]

Expanding and developing the delivery of telehealth services

8.25   At the committee's public hearing in Redcliffe, Queensland, Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, outlined the reasons for the potential for telehealth in Australia:

Telehealth has tremendous opportunities in a country such as Australia, where distances are tremendous and where we have a health system that is constructed in such a way that patients have to travel to access high-quality specialist services, especially if they reside in country areas.[23]

8.26   Dr Smith described an example of telehealth being able to bring in multiple specialists from across Australia:

I have had a child with an oncology condition diagnosed in Brisbane. I was able to organise three specialists in three different states of Australia who were able to meet and talk together with the family. That family would normally have had to spend a lot of money to travel around each of those areas, and the stress and inconvenience is incredible. However, we were

21   Mr Damien Ivereigh, Chief Executive Officer, Launtel, *Proof Committee Hansard*, 25 July 2017, p. 10.

22   Mr Damien Ivereigh, Chief Executive Officer, Launtel, *Proof Committee Hansard*, 25 July 2017, p. 10.

23   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 32.

able to make that happen with a videoconference with each of the specialists, and that was really good.[24]

8.27   Dr Smith agreed that, in the example above, there was the potential to seek out not only three specialists in Australia, but specialists globally.[25]

8.28   However, Dr Smith noted that telehealth is not just videoconferenceing, there is significant potential for 'store and forward' techniques.[26] Dr Mohanraj Karunanithi, Group Leader, Australian e-Health Research Centre, described the 'Remote-I' project as one example of store-and-forward technology:

> …we tested our store-and-forward telemedicine platform, called Remote-I, to close the gap in access to specialist eye care for Australians living in rural and remote areas. We conducted this study in Far North Queensland and remote Western Australia, using the Australian government broadband satellite. During the trial, we demonstrated that this was an effective and efficient way of providing eyecare services, reducing the number of patients that needed to be seen when an ophthalmologist visited these regions, and expediting patient care in critical cases. This also reduces the need for patients to travel to local health facilities and city hospitals.[27]

Royal Flying Doctor Service

8.29   Mr Martin Laverty, Chief Executive Officer of the Royal Flying Doctor Service of Australia (RFDS), explained initiatives that organisation, which has telehealth at the core of its services, will be deploying, in partnership with nbn:

- That RFDS bases and remote area clinics that RFDS visits on a regular basis, a total of about 300 locations across remote Australia, will be declared 'public interest premises', which will allow a community services access rate for the use of Sky Muster satellite services.

- The trial of six transportable antennas – four in aircraft and two in ground vehicles – to access the satellite for the primary health care services that RFDS provide across Australia.

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24   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 37.

25   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 37.

26   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 35.

27   Dr Mohanraj Karunanithi, Group Leader, Australian e-Health Research Centre, Health and Biosecurity, Commonwealth Scientific and Industrial Research Organisation, *Committee Hansard*, 6 April 2017, p. 32. See also: Mr Alan Taylor, *Submission 147*, which describes the Flinders Telehealth in the Home (FTH trial) trial conducted in South Australia during 2013-14. The FTH trial involved clinical care delivered from the hospital to the participant via video conferencing and compared connections provided over the NBN with connections via mobile data services.

- Exploring the provision of public interest premise concessions to RFDS medical chest holders,[28] which would give those medical chest holders access to Sky Muster services and the potential to conduct video health services with the RFDS.[29]

8.30 Mr Laverty noted that these arrangements were still being developed.[30] Pricing arrangements in relation to the satellite have not yet been settled and in relation to the transportable antennas, Mr Laverty stated that this was a 'genuine trial':

> At the end of six months I and my colleagues will be looking at the outcomes to see: have we been able to access better speeds, have we taken broadband to areas where it has previously not been accessible, is it reliable, does it work in aircraft? We genuinely have to test the antennas in our aircraft and the antennas that will be on the roads, and at the moment we are having challenges around weight. The antennas going into our aircraft weigh a little more than we would want them to weigh, and we are looking to ensure that we can find a robust system so those antennas can be sustainably put into all of our aircraft if the trial proves successful.[31]

8.31 Both Mr Laverty and Dr Smith described to the committee a joint project of their respective organisations:

> In partnership with the University of Queensland, through National Health and Medical Research Council funding, the flying doctor [RFDS] is undertaking a five-year randomised trial of the use of telehealth for chronic disease management of patients across 15 across remote communities to prove the testing and the development of different device uses in management of chronic illnesses, such as cardiovascular disease and diabetes.[32]

8.32 Mr Laverty also gave the following example of the direct economic benefits that the NBN could provide to the RFDS:

> In the current financial year we will pay $32,000 for access to ADSL broadband in Rockhampton. In the next financial year, we expect to spend

28 A Royal Flying Doctors Services' medical chest comprises over 100 commonly used medicines that are able to be prescribed by RFDS doctors over the phone. There are 3,500 locations with an RFDS medical chest, including property and station owners and post offices. See, Mr Martin Laverty, Chief Executive Officer, Royal Flying Doctor Service, *Proof Committee Hansard*, 26 June 2017, p. 10.

29 Mr Martin Laverty, Chief Executive Officer, Royal Flying Doctor Service, *Proof Committee Hansard*, 26 June 2017, pp 9-10.

30 See: Mr Martin Laverty, Chief Executive Officer, Royal Flying Doctor Service, *Proof Committee Hansard*, 26 June 2017, pp 10 and 14.

31 Mr Martin Laverty, Chief Executive Officer, Royal Flying Doctor Service, *Proof Committee Hansard*, 26 June 2017, p. 14.

32 Mr Martin Laverty, Chief Executive Officer, Royal Flying Doctor Service, *Proof Committee Hansard*, 26 June 2017, p. 13. See also: Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 35.

$7,000. That is a 78 per cent reduction in our costs at Rockhampton for accessing broadband services because of the arrival of the NBN at that location. We are also advised that we will have faster speeds when that service is deployed at Rockhampton. As we look at being able to expand NBN across Australia, having flagged that we currently spend $3.7 million per annum on access to telecommunications services, the potential for savings for Australia's most reputable charity is significant, and we are looking to harness those savings to return those revenues to our services.[33]

Bringing healthcare into the home

8.33   Dr Smith explained that the opportunities for telehealth were not only about transferring current model of patient-doctor interaction to an online environment:

> I think the preference would be to try to imagine this in such a way that it is a service we have not seen before. This is not about trying to improve what we have currently got; it is trying to think about what this will look like in 10 years. Ideally, the services should be as convenient as possible, and that is not just in a hub that you have to travel 300 kilometres to. Ideally, you want services that are available in the home, because it is not just the interaction that happens between the patient and the clinician but also what the patient can do for themselves. There is education, support, accessing information, keeping your own personal records, keeping your own information, having alerts and having systems monitor and guide you.[34]

8.34   In this context, Dr Karunanithi spoke of two projects that his organisation have undertaken related to using a fast broadband network:

> The first project we undertook developed a mobile platform technology to support older Australians to live longer in their own homes. In this project, we developed a platform that engages the older person, the family and the nursing service through an iPad app, an internet portal and sensors in the home.
>
> In the second project we conducted a national home telemonitoring trial in six sites on the east coast of Australia. The trial was aimed at seeing if telehealth intervention on older Australians with multiple chronic disease would reduce hospitalisations and GP visits. The outcome of this trial allowed a 50 per cent reduction in the rate of admissions to hospital, and a 46 per cent reduction in the rate of MBS expenditure.[35]

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33   Mr Martin Laverty, Chief Executive Officer, Royal Flying Doctor Service, *Proof Committee Hansard*, 26 June 2017, p. 9.

34   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 36.

35   Dr Mohanraj Karunanithi, Group Leader, Australian e-Health Research Centre, Health and Biosecurity, Commonwealth Scientific and Industrial Research Organisation, *Committee Hansard*, 6 April 2017, p. 32. See also: Mr Alan Taylor, *Submission 147*, which describes the Flinders Telehealth in the Home (FTH trial) trial conducted in South Australia during 2013-14. The FTH trial involved clinical care delivered from the hospital to the participant via video conferencing and compared connections provided over the NBN with connections via mobile data services.

8.35   Mr Alan Taylor, of eDevelopment Solutions, highlighted the importance of the NBN in achieving this care in the home:

> One of the main benefits of the NBN will be to deliver high quality home-based healthcare to Australians independent of where they live. With the rapidly ageing population, this will represent an increasing focus of healthcare.[36]

8.36   Dr Smith agreed with this point, but indicated that coverage was an issue:

> I think the greatest opportunity [for the NBN] is supporting people in the home. My experience in the last few years is that it has been a real struggle to connect with families in the home. Some families do have the NBN, and it works quite well. The majority of the families we deal with do not, and some of the remote areas that we are trying to connect to have very limited internet access in their entire town.[37]

8.37   Dr Smith explained that, in this context, NBN infrastructure is particularly important in regional and rural areas:

> At the research end we have our own networks. We have gigabits—and hundreds of gigabits, actually, in some instances—but, where we are now starting to translate the research into servicing people, that is where the NBN capability in regional and rural Queensland is absolutely essential. And it is, of course, more essential, because if you are in Brisbane or Sydney or Melbourne you can actually, with difficulty maybe, drive to the hospital. These options just are not available for people in these communities, so the NBN, as a device or a tool to get to these people, is going to be enormous. I think the future of telemedicine is critical. Again, we will never have the money. We will probably have less money to put into health over time. That is the reality. Telemedicine is a way to compensate and enable people to live in rural communities.[38]

8.38   Dr Smith referred to the delivery of mental health programs as one of the best examples of how telehealth has applied for patients. Dr Smith provided the following example of the importance of accessible and affordable internet connections for these types of programs:

> Another more recent program which we have been working with is called the Grow Program. The Grow Program is a national program that leads support groups during the recovery stages for, basically, people who have a mental health disorder. This has been a very successful program. We have been working with the Grow group in Queensland and looking at how we can extend a very successful program which is available to Sydney patients and groups to country environments. The No. 1 problem for us at the

36   Mr Alan Taylor, *Submission 147*, p. 5.

37   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 34.

38   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017.

moment has been ensuring that people have access to an internet connection. They just do not have it in their home. They have given many examples where they have either no internet or very limited internet and they just cannot afford to get it and then use it for that particular purpose.[39]

8.39   Professor Atkinson outlined a project he is currently discussing with Queensland Health, but noted the lack of NBN services as a significant impediment to the project:

The Townsville Hospital takes all neonatal babies from north of Rockhampton. A lot of the people cannot be with their babies for four months; they have to go back to their communities and back to work. The hypothesis is that, if they can see their child in the humidicrib when they need to, they will bond better with that baby. The international experience is that they will actually take those babies home earlier, saving in the health system money and days in hospital. But how do we do that? How do we provide that real-time video access to that baby without an NBN-type service in these remote communities?[40]

8.40   Dr Smith indicated the data allowances and speeds available on some services currently mean that some applications are not feasible:

I think the NBN is going to help us reach areas that we cannot currently reach. There are a lot of places that still require patients to travel large distances in order to reach their nearest hospital where they know there is a reliable internet connection. The families and places that we are trying to connect to in many remote locations may have internet but a very small amount of internet that costs them a lot of money, so they are reluctant to use the data for their consultations. They also may not have the speeds that are required to be able to do an appropriate clinical consultation.[41]

8.41   Dr Smith also noted that latency is an issue:

When you are doing a consultation there is nothing more distracting than having to wait for a minute for your voice to come back and answer. That is an example and a very important concern…I know historically when we are dealing with older telecommunications it was a real problem and a huge distraction for clinicians, who found that very difficult. My thinking is: is something better than nothing? I think the answer is yes; however, if we are

39   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, pp 39-40.

40   Professor Ian Atkinson, *Committee Hansard*, 7 April 2017, p. 18. See also: Professor Ian Atkinson, *Committee Hansard*, 7 April 2017, p. 21, describing another example of stroke patients being provided with ongoing monitoring and support via video, fitbits and other devices, once they have returned home after an initial intensive six month rehabilitation period in the Townsville hospital.

41   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 35.

striving for an excellent network that is going to do what we want to do then I think we should be aiming for better.[42]

8.42 The committee discussed with Dr Smith the possibility of using community infrastructure, such as a library, as a means of improving access to telehealth:

I guess a conservative approach would be to say that if, at the very least, we could get every library connected that would be fine as a method of, or an avenue for, providing clinical consults. There are some requirements when providing clinical working areas, and a very important one is privacy and security.[43]

Improving digital inclusion

8.43 Submissions and witnesses referred to Australian Digital Inclusion Index, which measures digital inclusion in three categories: accessibility, affordability and ability to use.[44] The Queensland Government summarised the results from the 2016 Digital Inclusion Index:

The Australian Digital Inclusion Index 2016 (ADII) report measures the level of digital inclusion across the Australian population, and monitors this longitudinally, collecting data for three years to date. The report provides a view of digital inclusion in Australia regarding access, affordability and digital ability, providing a national, state, regional and socio-demographic snapshot.

Overall, the ADII has found that digital inclusion is improving in Australia however, there is a 'digital divide' between people on lower incomes, compared to those on higher incomes. Particular communities and social groups, such as people aged over 65 years, people with a disability, people with less than secondary education, people not in paid employment or receiving a lower income, and Aboriginal and Torres Strait Islanders are the most digitally excluded.

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42   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 38.

43   Dr Anthony Smith, Associate Professor and Deputy Director, Centre for Online Health, University of Queensland, *Committee Hansard*, 6 April 2017, p. 37.

44   See: Ms Louise Denoon, Executive Director, Regional Access and Public Libraries, State Library of Queensland, *Committee Hansard*, 6 April 2017, pp 1-2; Ms Teresa Corbin, Chief Executive Officer, Australian Communications Consumer Action Network, *Committee Hansard*, 19 April 2016, p. 12; State Library of Queensland, *Submission 6*, pp 1-2; and Queensland Government, *Submission 21*, p. 23. See also: Mr Daniel Featherstone, General Manager, Indigenous Remote Communications Association, and Director, Broadband for the Bush Alliance, *Proof Committee Hansard*, 17 July 2017, p. 9, who also noted the limitations in data collection of the Australian Digital Inclusion Index in terms of picking up the inclusion or exclusion of remote Indigenous people.

> The report suggests that community-specific initiatives are required to address digital exclusion alongside measures to improve affordability.[45]

8.44   The committee received some evidence about some of the groups which were identified as 'most digitally excluded', namely Aboriginal and Torres Strait Islanders, and people aged over 65 years.

8.45   Mr Daniel Featherstone, General Manager, Indigenous Remote Communications Association (IRCA), spoke of access to government services as one example of how Aboriginal and Torres Strait Islander people, particularly those living in remote communities, may be digitally excluded:

> People are reliant on online government services now. In particular, myGov and My Health are critical to people getting their community benefits. A lot of people are not getting those benefits now because there is a lack of digital literacy and affordability to access online services. Many people are being breached or are unable to afford to get online to do their reporting to Centrelink and are therefore missing out on getting their welfare payments.[46]

8.46   In its submission, the Northern Territory Government referred to the potential of broadband connectivity in addressing this exclusion:

> Provision of a superior broadband connection in remote communities will be a significant factor towards closing the gap of Indigenous disadvantage. It would enable improved well-being for individuals and families living and working in some of the most remote locations in Australia by improving access to essential health and education facilities and other online services provided by the Northern Territory Government which is increasingly delivering services digitally.[47]

8.47   Mr Featherstone also spoke of digital inclusion in the context of Closing the Gap:

> One of the activities that are underway at IRCA, coming out of the recent Broadband for the Bush forum, is to push for digital inclusion to be considered a Closing the Gap indicator because it will enable many of the other Closing the Gap indicators around health, education, employment, housing and so on. We see digital inclusion helping to leverage a lot more support for other outcomes.[48]

45   Queensland Government, *Submission 21*, p. 23. See also: Ms Louise Denoon, Executive Director, Regional Access and Public Libraries, State Library of Queensland, *Committee Hansard*, 6 April 2017, pp 1-2.

46   Mr Daniel Featherstone, General Manager, Indigenous Remote Communications Association, and Director, Broadband for the Bush Alliance, *Proof Committee Hansard*, 17 July 2017, p. 8. See also: Ms Teresa Corbin, Chief Executive Officer, Australian Communications Consumer Action Network, *Committee Hansard*, 19 April 2016, p. 2.

47   Northern Territory Government, *Submission 2*, p. 2.

48   Mr Daniel Featherstone, General Manager, Indigenous Remote Communications Association, and Director, Broadband for the Bush Alliance, *Proof Committee Hansard*, 17 July 2017, p. 8.

8.48   However, Mr Featherstone noted:

> To get people connected isn't as simple as giving a one-size-fits-all model. We need to build on what people are already familiar with and having relevant applications and information in language or visually to help get people through their own learning journeys. IRCA's been doing some work in that with our inDigiMOB digital mentors project, and we have been trying to encourage a program to employ local people to be the digital mentors, to support their family and friends through a peer learning model. There is a range of different components to building digital inclusion, and it is certainly not just about infrastructure. That is only one part of the puzzle.[49]

8.49   Ms Louise Denoon, Executive Director, Regional Access and Public Libraries, State Library of Queensland, provided the following example of assistance for older people in Queensland public libraries through a specialised program:

> With the Tech Savvy Seniors Program, often it has been imperatives like being able to connect with families—how to use Facebook—because they are missing out on all of these rich family stories that are going on there. It is understanding what solution they need. We have had stories, particularly of older couples, where one of them has done all the online banking and all of that stuff. That person has died and the other person—the widow—has not really known how to access it and how to pay the bills. Sometimes it is that direct. Or it could be online shopping.

> Often, people come to public libraries—older people—to do family history. Family history now requires very significant digital skills to be able to find the information that is wanted. It is also health, knowing how to access health resources. If your kids are in remote Indigenous communities, if your kids are at boarding school in Cairns, how do you talk to them? How could you Skype in? How do you connect in that way? The needs are many and varied but some are as basic as government services. Others may be that small businesses want to be able to access information that is only online. That incubator service supporting entrepreneurs in communities is an emerging trend, and libraries are looking to meet that demand.[50]

Participation in education and training

8.50   Evidence to the committee demonstrated a variety of opportunities that the NBN may provide for participation in education, from preschool aged children, right through to training and development for professionals. Witnesses also shared the challenges that they faced in accessing education opportunities through NBN and the implications that this had.

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49   Mr Daniel Featherstone, General Manager, Indigenous Remote Communications Association, and Director, Broadband for the Bush Alliance, *Proof Committee Hansard*, 17 July 2017, p. 11.

50   Ms Louise Denoon, Executive Director, Regional Access and Public Libraries, State Library of Queensland, *Committee Hansard*, 6 April 2017, p. 3.

8.51   At the public hearing on the Central Coast, Mr David Soede, Director of ICT at Central Coast Grammar School and the Educational Infrastructure Spokesperson for Managers of IT in Education, provided a number of detailed examples of how a high quality NBN could benefit students' education. For example:

> What about learning a foreign language using a traditional classroom setting versus the possibility of a one-to-one video conference between students in our country and other countries? Think about China or Japan. You have students who want to learn a foreign language. A lot of the Asian languages in particular are very heavy on inflexion, so you cannot just have a single sound phonetically said. The inflexion on that syllable is really important. You can only get that across a decent connection. High speed, low latency allows that high audio quality.[51]

8.52   At the public hearing in Townsville, Ms Susan Parsons, the Senior Engagement Officer for Mareeba Shire Council, spoke of the possibility of the NBN bringing tertiary education opportunities to that shire, which is located west of Cairns:

> The way that education is being delivered these days—vocational and tertiary—is that you do not actually need to be in the classroom, because it is live but online. So what I see happening in places like Mareeba is that they do not need to drive to Mareeba to attend the class; it can be like in a virtual classroom. Without the capacity or the reliability of the NBN, they are the types of opportunities that they will miss out on.[52]

8.53   At the public hearing in Adelaide, Professor Shane Dawson, Teaching Innovation Unit, University of South Australia, described how the NBN may overcome the current limitations to providing tertiary course content via distance:

> Internet coverage is pretty good in Australia as it is, whether it is NBN or down to 4G or 3G networks, satellites and so on, so we get into remote areas quite well. So, the access at the moment is fine. We can actually deliver education. The issue…is that it does impede the level of education that we would like to provide. We have the capacity now around 4K videos that we would take of geological representations around the Flinders Ranges that we would like to beam into students. You cannot do that now with the current internet access standards, which means that they do not see that same visualisation as on-campus students would see. If we are going to spread and have greater flexibility and diversity then we need better internet access speeds. As for how that rolls out across through the NBN, obviously the sooner the better, I would argue.[53]

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51   Mr David Soede, Director of ICT, Central Coast Grammar School and Educational Infrastructure Spokesperson, Managers of IT in Education, *Proof Committee Hansard*, 2 August 2017, p. 36.

52   Ms Susan Parsons, Senior Engagement Officer, Mareeba Shire Council, *Committee Hansard*, 7 April 2017, p. 14.

53   Professor Shane Dawson, Teaching Innovation Unit, University of South Australia, *Proof Committee Hansard*, 27 June 2017, p. 36.

8.54   At the hearing in Burnie, Mr Chris Walpole, a pharmacist from Queenstown, described how the NBN might facilitate professional development:

> Training and education is a vital component of our pharmacy business strategy in Queenstown, and we're continually looking at opportunities to access more efficient training without the distractions and annoyance of the pixelation and freezing of the images which currently exists. As a pharmacist, access to national conferences for the purposes of training and CPD [continuing professional development] is expensive in its current form, as there is the requirement to find a locum pharmacist, the expense of accommodation and interstate travel. An NBN connection would enable access to conference webinars without having to leave the community, which is an overall cost saving to the pharmacy and the health system. We are hoping, therefore, that the NBN will enable our business to be more efficient.[54]

8.55   Mrs Joanna Gibson, representing the Isolated Children's Parents' Association (ICPA), explained the importance of a fast, reliable and affordable internet connection for students undertaking distance education:

> Over the years, as the curriculum for the schools of distance education has moved to an online format, we have become increasingly reliant on an affordable, reliable and fast internet connection. The legacy nightmare that was the oversubscribed interim satellite service remains all too vivid in the memories of many of our members. There is an enormous demand in rural and remote areas for a reliable and affordable internet service.[55]

8.56   Mrs Gibson noted the work her organisation has done with the federal government and the nbn during the rollout of Sky Muster to address the requirements of families educating children and home and living in isolated locations.[56] Mrs Gibson referred to the same challenges with Sky Muster as are canvassed in Chapter 4 of the committee's report.[57] However, Mrs Gibson did note the 'huge assistance' that the education port has provided to distance education students:

> The education port comes under one of these PIP [Public Interest Premises] sites. At the moment, it is just for students studying via distance education. They have to be signed off by the department of education and NBN in order to access this port. It is 50 gigabytes per student for up to three

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54   Mr Chris Walpole, Pharmacist, QMU Pharmacy, *Proof Committee Hansard*, 26 July 2017, p. 39. See also: Mr Warwick Hough, Director, Workplace Policy, General Practice and Legal Services Department, Australian Medical Association, *Proof Committee Hansard*, 23 June 2017, p. 27, discussing the same point in relation to the training and professional development of rural doctors.

55   Mrs Joanna Gibson, Portfolio Leader, Federal Council, Isolated Children's Parents' Association of Australia, *Proof Committee Hansard*, 26 June 2017, p. 17.

56   Mrs Joanna Gibson, Portfolio Leader, Federal Council, Isolated Children's Parents' Association of Australia, *Proof Committee Hansard*, 26 June 2017, p. 17.

57   Mrs Joanna Gibson, Portfolio Leader, Federal Council, Isolated Children's Parents' Association of Australia, *Proof Committee Hansard*, 26 June 2017, pp 17-18.

students. So it can be up to 150 gigabytes that you can access for education and it is a priority signal so it is always at speed; it is not off-peak and peak.

…

It is a huge benefit for people studying by distance education because they are separate from the household and separate from the business, and they can concentrate on doing everything that their school curriculum requires of them. If they have to do research or something, they can watch YouTube or look at lots of articles or whatever without any worry about limits.[58]

8.57   Mrs Gibson continued:

The provision of the education port is a huge assistance for those studying by distance education. However, it does not assist those studying in a small rural school, students returning home from boarding school during holiday breaks, or those studying at a tertiary level. These students still need adequate internet to be able to complete homework and assignments, do research and watch online lectures.[59]

8.58   In its submission, BIRRR argued that there is a need for a tertiary education port to be established, similar to the distance education port:

Sky Muster customers are limited to one connection per household/location, which (in many cases) needs to be 'rationed' for business, health, education and personal needs. As such, there is a huge risk that RRR [rural, regional and remote] children and tertiary students will be unable to access the internet adequately for their studies, and will fall behind their metropolitan peers.

Whilst the development of the educational port for distance education and home school students using Sky Muster services is a welcome initiative, it is not accessible to tertiary students or primary and secondary students in mainstream schools, who also need internet access to complete homework, research and assignments.[60]

8.59   In relation to secondary students in mainstream schools, Ms Lee Longmire from the Riverina region in New South Wales, spoke of the experience of her family, who only have access to mobile broadband, which she described as 'very expensive, a bit unreliable and a bit patchy'.[61] Ms Longmire's children attend 'an old-school school, where they do not have laptops for them'.[62] Ms Longmire described the implications

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58   Mrs Joanna Gibson, Portfolio Leader, Federal Council, Isolated Children's Parents' Association of Australia, *Proof Committee Hansard*, 26 June 2017, p. 19.

59   Mrs Joanna Gibson, Portfolio Leader, Federal Council, Isolated Children's Parents' Association of Australia, *Proof Committee Hansard*, 26 June 2017, p. 18. See also: Better Internet for Rural, Regional and Remote Australia, *Submission 101*, pp 51-52.

60   Better Internet for Rural, Regional and Remote Australia, *Submission 101*, p. 52.

61   Ms Lee Longmire, Community Member, Narrandera Shire Council, *Committee Hansard*, 20 April 2017, p. 23.

62   Ms Lee Longmire, Community Member, Narrandera Shire Council, *Committee Hansard*, 20 April 2017, p. 27.

for her children, and particularly her daughter who is currently studying year 11 as a result of the need to ration data:

> Speak to my children! They get told, even when we have 150 gigabytes of data, that they cannot willy-nilly just go on anything. My daughter—who is in year 11 and who is doing compressed curriculum HSC, so she is completing her first three HSC subjects at the moment—has to come and check: 'Mum, is it okay if I go on'—to watch whatever video the class has been told they need to watch, or download or look up anything. This is a kid trying to complete her HSC. My son loves it when we go to a hotel somewhere. His first question is: 'Mum, does it have free wi-fi?' He is like, 'so am I allowed to watch'—whatever little Minecraft video thingies he wants to watch. Those rationing things are real.[63]

8.60   The committee also heard from Arabella Zocher, a Year 9 student at the Central Coast Rudolf Steiner School, who explained to the committee that her school used ADSL wi-fi and that the school does not have access to the NBN. Arabella described what this meant for her, and her classmates:

> …with an increasing workload of over 300 people, the school is struggling to work efficiently and sometimes struggling to even work at all. YouTube has many educational platforms. Mathletics is a great way to reinforce mathematical skills. Both of these take up a large amount of bandwidth. So when we try to have a Mathletics class, half of the year cannot work, which causes major disruptions to our education. Apart from being frustrating, it denies us the opportunity of nurturing a love of maths. The Internet can collapse even though only 50 people can be using it at a time. At times, streaming websites have to get blocked because the network cannot handle the traffic.

> …it is hard to use online textbooks and things. We are always using the big heavy textbooks and things. We cannot access the online ones because they need time to load and they have a lot of information in them.[64]

Committee view

8.61   The rollout of the NBN presents many economic, health and business opportunities to residents in regional, rural and remote Australia. The committee received evidence of very positive developments occurring in regional areas, including: businesses leveraging the capabilities of the NBN; innovation in agriculture; improved educational opportunities for distance education students; and initiatives to expand the provision of health services.

8.62   The committee understands that there are some concerns in relation to the limitations of the NBN, particularly in relation to future capacity.

8.63   The committee is concerned that NBN is delivering a service of quite varied quality with the potential to fall short of a ubiquitous network in which a foundation

63   Ms Lee Longmire, Community Member, Narrandera Shire Council, *Committee Hansard*, 20 April 2017, p. 26.

64   Arabella Zocher, *Proof Committee Hansard*, 2 August 2017, pp 55 and 56.

of reliable, affordable, high-speed internet is available to the vast majority of households and businesses. The uneven nature of the multi-technology mix and the apparent over-use of satellite broadband could exacerbate existing social, economic, and digital inequality.

8.64   The committee notes the evidence that it received that accessing services through a community facility, such as library, may be an option in some circumstances. In Chapter 4 the committee referred to the merit of nbn undertaking some analysis about increasing the number of premises in the fixed wireless footprint. In the committee's view, this analysis should include prioritising facilities such as libraries, hospitals and community health services for receiving fixed wireless connections instead of a Sky Muster service.

8.65   In the committee's view, it is important that all Australians are able to access a high quality NBN service. While the committee is encouraged by the fact that the rollout is ahead of schedule, it has to be noted that the quality, ubiquity, and fairness of the NBN is under question.

8.66   The committee believes that the current design and rollout of the NBN is likely to maintain the 'digital divide', which means that particular communities and social groups will not share in the benefits of broadband technology, but will instead find themselves further separated in terms of full social and economic participation in Australian life.

Recommendation 23

8.67   The committee recommends that the Australian Government ensure that digital inclusion is measured and reported. It has been suggested that the Productivity Commission assess and report on income and wealth inequality in Australia, and it may be worth including the measurement and reporting of digital inequality, as the two areas are likely to be increasingly related.

Hon Sussan Ley MP
Chair