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The NBN Futures Forum

[Leith Campbell](#) ^[1]

RMIT University

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Learning from International Experience

Abstract

On 25 February 2020, TelSoc hosted the third NBN Futures Forum in Melbourne on the theme of learning from international experience for Australia's National Broadband Network. Three speakers discussed various aspects of the topic, including comparisons via league tables, the experience in New Zealand, and the need for good broadband to participate in the global economy. Discussion following the speeches brought out a need to understand the range of demands for broadband from a variety of end users and industrial applications.

Introduction

The NBN Futures Project (Holmes & Campbell, 2019^[5]) has been organizing a series of public forums under the title NBN Futures to encourage debate, and potentially to build consensus, about the future of Australia's National Broadband Network (NBN) now that the initial rollout is nearing completion. The forums are hosted by TelSoc (the Telecommunications Association Inc, publisher of this *Journal*). The first forum was held in July 2019 and is summarized in Campbell & Milner 2019^[6]; the second, held on 22 October 2019, is summarized in Campbell 2019^[7].

The third forum, held on 25 February 2020 in Melbourne and online, had the theme of "Learning from International Experience". Three speakers addressed various aspects of this theme in short presentations of no longer than 15 minutes. Discussion from the audience and online followed.

The NBN Futures Forum

After some opening remarks by Mr John Burke, who chaired the event, the three speakers were invited to address the theme of "learning from international experience".

Richard Ferrers: International comparisons

Dr Richard Ferrers is with the Australian Research Data Commons, which promotes data science as a new technology for research and which could be described as a "sister project" of the NBN. He addressed the topic of comparing Australia's NBN to projects in other countries with a view to maximizing the value of the NBN. He aimed to broaden the discussion of "value" of the NBN beyond simple comparisons of download speeds.

He noted first that the Broadband Commission (a joint initiative of the ITU and UNESCO) had proposed seven targets to be achieved by 2025, with the aim of promoting "meaningful universal connectivity". "Broadband" was assumed but none of the targets mentioned download speed specifically. The first target was that, by 2025, all countries should have a funded national broadband plan or strategy. Other targets emphasized affordability, widespread availability, access to digital financial services and the connection of SMEs. For end users, there should be development of a minimum level of digital skills and gender equality across all targets.

Nevertheless, speed and availability had been important and there had been substantial progress in the period 2009 to 2019. Dr Ferrers noted that, in 2009, an average dialup user would download 100 MB per month, while a broadband user would download, on average, 6 GB per month. In 2019, the average user downloads 250 GB per month. Despite this progress, Australia remains at the low end of comparable countries. OECD figures from 2018 showed Australia second last and, if all other countries remained unchanged, the completion of the initial rollout of the NBN would promote Australia only to the middle of the pack in terms of speeds actually being used. A key issue is that few, if any, Australians purchase download speeds above 100 Mbps.

Narrowing the focus to Australia's major trading partners, fixed-line broadband coverage in Australia of 90% was exceeded by all except the United States, but Australia's average download speed of at least 50 Mbps was exceeded only by the USA and Republic of Korea (and, perhaps, marginally by New Zealand).

Focussing then on some examples, Dr Ferrers considered the policies and outcomes in South Korea, China and Thailand. In South Korea, the plan has been to provide 99% coverage of FTTH, with 50% coverage to 10 Gbps download speed by 2022. He pointed out that the access technology was a "multi-technology mix", like Australia's NBN: HFC access has declined only slightly since 2007 and still provides about 4 million accesses, while FTTH has risen rapidly.

In China, the broadband strategy from 2013 envisaged broadband coverage of urban and rural areas by 2020. About 70% of households now have broadband access of 50 Mbps download speed or more. About 50% of urban home users have 100 Mbps and some home users in developed cities have 1 Gbps. At the end of 2017, about 84% of users were on fibre access. A clear contrast with Australia is that there is a high proportion of users on 100 Mbps or greater in China. This suggests that NBN Co should pay more attention to high-speed usage.

In Thailand, 39% of its 18 million households have fibre access, including users on 1 Gbps. One provider, True, has recently reduced its price for 1 Gbps access to \$140 per month (from \$499 per month). This is leading to a steep increase in average download speeds in Thailand.

In comparison with all its major trading partners, Australia lags all countries except India in average download access speeds, according to Ookla data, and improved only slowly from 2018 to 2019.

Dr Ferrers noted, however, that there was significant potential in the NBN to improve average download speeds. The first NBN services at Gigabit-per-second speeds should be offered from May 2020 and about half the accesses – those based on FTTP, HFC and FTTC – could potentially have access to such services. A small proportionate take-up of Gigabit-per-second services could improve Australia's ranking in terms of average access speed and a 20% take-up would put Australia ahead of all OECD countries (assuming no improvement in other countries). While the emphasis had been on availability and coverage, there were other values to be considered for the NBN, including affordability, reliability, usability and gender equality.

In summing up, Dr Ferrers made five recommendations for improving the value of the NBN:

- Provide affordable Gigabit-per-second services (from May 2020);
- Emphasise upgrades after the initial rollout is complete;
- Focus on usage, rather than availability, after the initial rollout;
- Plan for and measure customer satisfaction;
- Plan for and measure the NBN performance in comparison with international league tables, including with major trading partners.

Dr Ferrers has expanded on his presentation in a more detailed article, published elsewhere in this issue (Ferrers, 2020 ^[8]).

Murray Milner: the New Zealand experience

Dr Murray Milner, who was a director of Crown Fibre Holdings in New Zealand for 10 years, addressed the issue of what could be learnt from the New Zealand experience. He noted first that there were three broadband programs: the Ultra-fast Broadband (UFB) program for FTTP; several Rural Broadband Initiatives; and a Mobile Blackspot Fund. These programs will together give 99.8% of New Zealanders access to enhanced broadband by the end of 2023.

These programs had benefited from strong cross-party political alignment, leading to stable policy formation from 2006 onwards. The initial target of FTTN to 80% of premises was replaced in 2009 by UFB and the UFB and other programs have continued or been enhanced since the current government came to power in 2017.

The UFB program was based on a set of commercial principles that provided for wholesale access provision of FTTP and competitive retail service provision. The government would support only fibre access to the property boundary, deemed to be “common fibre access infrastructure”. Thirty-three candidate areas were identified in which it was estimated fibre to the property boundary could be provisioned for no more than NZD 1,500 per premises passed (in 2010 dollars). Government support would be capped at this level and the wholesaler, selected by tender, for each area would enter into a public-private partnership or would be granted an interest-free loan. Each wholesale provider would also have to meet strict contractual obligations on its rollout schedule. Existing broadband access would continue to operate and there would be no forced migration to UFB.

In the event, four wholesale service providers were supported, with the largest, Chorus, covering 24 of the 33 areas. All premises in these areas were to be passed by the end of 2019 (achieved in November 2019), with 95% of priority premises passed by the end of 2015. Take-up of FTTP has been around 55%. The result has been a steady increase in FTTP connections replacing FTTN. At the end 2019, FTTN accounts for only 30% of broadband accesses.

While the UFB had been a success, it was not always smoothly achieved. Dr Milner suggested that the problems encountered with the UFB rollout fell into three categories: resourcing, cost and connections. The resourcing issues involved the ramp-up and health and safety practices of the field workforce. The cost issues, especially for Chorus, involved bringing the cost per premises passed down to the level of support provided by the government. Chorus had suffered severe debt issues in 2016 as the costs were being reduced. The connection issues arose from the variety of premises to be served, from single houses to multi-dwelling buildings. There could be provisioning delays, leading to customer and retail provider dissatisfaction.

When Ultrafast Fibre, a wholesale provider for the UFB, bought out the government’s portion of its public-private partnership in 2016, the government recycled its windfall into an extension of the UFB program. With the government support increased to be no more than NZD 2,000 per premises passed, it was possible to extend the UFB program to 87% of New Zealand premises, covering over 400 cities and towns, to be completed in 2022.

For the remaining 13%, Dr Milner reported on a number of government programs. A first rural broadband initiative ending in 2013 provided a grant to Vodafone (selected by tender) to enhance its coverage in rural areas. A second rural broadband initiative, ongoing to 2023, will see further government support of NZD 180M. There are also a Mobile Blackspot Fund and support for services to marae (Māori meeting places) with funding to 2023.

The outcome of all these programs is that, by the end of 2023, 99.8% of premises will have been provided with enhanced broadband (at least 50 Mbps downstream). Government support has been NZD 2.1B, with over NZD 1.0B of capital from the UFB program due to be returned by 2036. In the UFB areas, take-up has been about 55%, with 10% take-up of 1 Gbps downstream service. Higher speed services at 2, 4 and 8 Gbps are being introduced in 2020.

Dr Milner has provided a more detailed account, published elsewhere in this *Journal* (Milner, 2020 ^[9]).

Jim Holmes: international experience

Dr Jim Holmes based his remarks on his experience as an international consultant working on national broadband plans or action plans in 10-12 countries. He took issue with the idea, promulgated by the Vertigan committee (Vertigan, 2014^[10]), that one could estimate a cap on access speed and individual or household requirements for the next 10 or 20 years. This, he maintained, was putting a cap on people's capacity to participate in the digital economy if it meant that services were planned to this limit. Household requirements were not just a matter of streaming video but, rather, access to processes and systems that will be required for full social and economic inclusion at any location.

Dr Holmes had many examples of where limited access to broadband had undesirable effects. For example, he noted that it may not be possible to attract or retain staff in regional and remote areas without good broadband and this affects all business, not just industries linked to broadband.

He noted also that business systems are often designed around the broadband capabilities common in Europe or the US. He cited examples where primary producers without satisfactory broadband had sent data via people flying to the US or via competitors in better served areas in order to enter data into market systems. Clearly these workarounds were costly and unsustainable. Participation in the modern online economy required good broadband access.

In commenting on the previous speeches, Dr Holmes noted, firstly, that he was somewhat sceptical of the quality of inputs to international league tables. He suggested that the inputs from some countries were not always well based. From the New Zealand experience, he felt the key learning was that bipartisanship was critical to provide commitment to long-term policy and continuity.

For Australia, Dr Holmes remarked that broadband was no longer a "blank canvas": the need now is to influence what Australia should do from now on. He suggested that there were two key actions to be undertaken: make long-term plans for long-term infrastructure and long-term investment; promote usage of broadband and ensure there are no functional capacity constraints.

Questions and discussion

Questions and discussion from those attending in person and online followed the speeches.

For new broadband services, what level of asymmetry between download and upload speeds can be expected?

Dr Milner believed that the less asymmetry in the provision of broadband services the better the performance experienced by users for most applications. While symmetry is always best, asymmetry of 2:1 or even up to 5:1 is satisfactory for most applications and these are the ratios typical for most UFB products provided in the New Zealand market. Symmetric products are also available at a small premium.

Dr Ferrers suggested that NBN Co has been trying to optimize revenue by providing more download capacity at the expense of upload capacity.

Can fixed wireless access stimulate demand for fibre access? Explanatory comment from the questioner: *Fixed wireless access as a competitor to fibre can have an impact especially in areas not yet served by fibre or where fibre is foreshadowed. Spark has been promoting this option, especially for one-person premises. Spark moves high usage premises onto UFB in order to meet performance standards.*

Dr Milner remarked that the current take-up of UFB is at the maximum level that can be supported by the wholesale service providers.

Can Jim Holmes clarify his comments about forecasts of usage? The Vertigan report did use data on actual usage to estimate demand.

Dr Holmes suggested that current usage was constrained by current availability of broadband. There was a need to promote usage of broadband for access, for example, to government services. It would be wrong to maintain constrained views of usage without a scalable future, as usage will continue to increase.

There has been an emphasis on internet and broadband speeds, but speed can be quoted in a number of ways: the maximum that can be provided; the subscription speed; the actual throughput. What measure is best for comparison?

Dr Ferrers suggested that, for value comparisons, the key question is “what experience am I getting?” However, the headline speed is usually used for comparisons. The OECD measures what customers are sold. Ookla is measuring actual performance.

Dr Milner noted that in New Zealand the speeds sold on fibre are guaranteed to be $\pm 5\%$ at all times. FTTN and fixed wireless access both suffer from severely degraded periods.

A follow-up comment from the questioner: It is difficult to compare between countries. Ookla tests may be unrepresentative because customers test either when they are suffering unreliable performance or when they wish to boast about the speed they are getting. Akamai figures may be more reliable because they are measurements of actual web browsing. In any case, the technology capability may be much more than what is sold.

There are many accesses in China at 100 Mbps or greater but not in Australia. What differences are there between Chinese and Australian end-users?

Dr Ferrers suggested it might be a good idea to ask Chinese students in Australia. In any case, he suggested there was not much published data. It is possible that in some parts of China users are being moved to higher rates without any other change. It was not clear that the average Chinese user changed his or her online behaviour as a result.

Dr Holmes believed it was necessary to look at a whole range of users, not just typical households. For example, work time at home is common in the global economy and will become more so as the distinctions between being at work and not being at work break down further.

How important is working from home in broadband provision?

Dr Holmes maintained that working from home, or from any location, will be increasingly important. He suggested that there was a general need to understand the demand side of broadband access, not just the supply side.

What other uses will affect the demand for broadband access? Explanatory comment from the questioner: *Big data is coming. There will be new infrastructure needed for instrumenting all highways and traffic lights, etc. 5G is emerging and will need backhaul infrastructure. The industrial demand for broadband will be enormous.*

Dr Milner reported that more and more roadside devices in New Zealand are being connected by fibre. The UFB program had included these devices. Also, 5G backhaul and fronthaul will be provided on fibre.

Dr Ferrers remarked that NBN Co will be supplying fibre connections to elevators for the emergency telephones. The NBN can handle large traffic volumes.

There has been a lot of research on internet usage in the past but less so now. Who has the political and social clout to promote the study of usage and develop policy in this area?

Dr Holmes suggested that the NBN Futures group would be working on this issue as part of a long-term plan or framework for broadband development. He noted that because of the technological diversity of the NBN there may be different user behaviours to work around the limitations of the NBN in some areas.

Conclusion

This was the third of a planned series of forums on the topic of the future of the NBN. Much emphasis to date in the development of the NBN has been on availability and download speed. While the NBN is making a step-change improvement in both broadband availability and speed, the international comparisons show that Australia has not yet fully addressed the availability issue. Most of Australia's major trading partners have wider availability of broadband (up to 99%) and in New Zealand there are well funded programs to provide enhanced broadband to the 13% of premises not covered by the UFB fibre rollout. Experience suggests that the ability to retain workers depends on good broadband access to the international digital economy and that workarounds to cope with poor broadband access are expensive and inefficient.

On access speed, Australia's NBN will provide 50 Mbps downstream as a minimum for most premises and few services above 100 Mbps. The international comparisons suggest that this is a minimal capability today. There are many countries in which speeds above 100 Mbps are common. There is a clear desire and willingness to pay for higher speed access – in New Zealand, about 10% of the current take-up of fibre access is for 1 Gbps service. If the NBN were to provide a substantially higher proportion of accesses above 100 Mbps, it would significantly improve Australia's "league table" broadband standing.

There is a clear need to understand in more detail the range of users and uses of the NBN, that is, the demand for broadband access and the drivers for this demand. Looking at "typical households" will be insufficient: working from home is becoming more common and demands for bandwidth by all applications continue to grow. Commercial demands in the era of "big data" will also grow. At the moment, it appears there is little published data on drivers of increased demand and changes in end-user behaviour.

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