



**Future Party Submission
to the Senate Enquiry
on NBN Co's Strategic Review**

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Key points

The primary objective of government funding of the National Broadband Network (NBN) project is to deliver high-speed broadband internet to all Australian households to ensure that Australians are positioned to take advantage of the economic, educational, health and social improvements made possible through high-speed internet. Part of this plan is to connect remote areas where telecommunication carriers do not consider building infrastructure for high-speed internet to be a worthwhile investment. The NBN project is an ambitious and costly one, but it will also provide a great many benefits to Australians for many decades to come.

The strategic review conducted by NBN Co focuses on the revenue generated through the sale of NBN products, but spends very little time analysing the value that the NBN will produce, particularly in improving economic productivity and social flexibility through the ability to work from home. A high-speed NBN will make it feasible for doctors to remotely diagnose medical conditions, students to remotely participate in courses, and allow businesses to collaborate productively with clients and colleagues overseas with high quality video conferencing and fast file sharing. These are only a few examples, and given the rapid pace at which technology advances, we are yet to realise the many benefits the NBN will provide in the coming years.

Summary of key points

- *An economically successful NBN cannot be measured in the direct profit derived from the sale of NBN products.*
- *The proposed NBN is too slow.*
- *The proposed NBN is bad value for money.*
- *Better upload speeds mean more potential benefits.*
- *The proposed NBN may be unfair.*

Summary of concerns

The strategic review conducted by NBN Co proposes an alternative plan of deployment of the NBN identified as the Optimised Multi-Technology Mix proposal. In addition to deploying Fibre to the Premises (FTTP) and Fibre to the Node (FTTN), the proposal includes the use of the existing cable network that utilises Hybrid Fibre-Coaxial (HFC) technology. This approach is targeted so that up to 75% of premises will have access to 100 Mb/sec internet speeds by 2020 at a lower cost to the taxpayer. While the Future Party agrees that it is beneficial to have access to faster internet speeds slightly sooner (2021 versus 2024), we would like to express several concerns about the Optimised Multi-Technology Mix proposal, in particular with regards to utilising the HFC technology.

Our concerns can be summarised as follows:

- The focus of NBN Co should be on finding the best deployment strategy to optimise future benefits to society, rather than on minimising short term costs and maximising revenue.
- The promised download speeds of 100 Mb/sec are likely to be insufficient by 2020 to support the increasing range of bandwidth-heavy activities, such as video conferencing.
- The importance of supporting higher upload speeds is overlooked; high upload speeds are necessary for productive online collaboration involving large files.
- Unlike FTTP, all of the components in the Multi-Technology Mix proposal will require upgrades when speeds of over 100 Mb/sec need to be supported in the next 10-15 years, making the current investment strategy a waste of taxpayer money.
- In the short term, apartment dwellers may not receive access to the HFC network due to physical limitations preventing access to the cable network in apartment buildings, and the cost to landlords to fix these issues.
- A lack of high speed fibre connection will put pressure on the wireless service spectrum, which already has potential speeds above that of the proposed NBN alternative.

Based on these concerns, the Future Party believes that the Optimised Multi-Technology Mix proposal will not provide the best value for the taxpayer money spent. Instead, we would like to recommend that NBN Co continue to deploy Fibre to the Premises, and reduce the costs by using the Radically Redesigned FTTP approach presented as Scenario 2 in the strategic review. Although the approach would cost \$23 billion more than the Multi-Technology Mix approach, in 2023, 100% of the premises in the FTTP zone will have access to 100 Mb/sec download speeds, with the added benefit of having a broadband network that can support speeds of up to 1000 Mb/sec at a low cost in the future. It is the opinion of the Future Party that the three year delay and additional cost is more than outweighed by the benefit of having a network that will be able to support our society and economy well into the future.

An economically successful NBN cannot be measured in the direct profit derived from the sale of NBN products.

The value of the NBN project should be measured in terms of the benefits it will provide to the economy and society, rather than the cost to deploy the network, or the short-term revenue it will generate.

The Future Party believes that the economic success of the NBN cannot be measured in the direct profit derived from the sale of NBN products. While minimising costs over the next decade to provide the minimum viable speeds may seem to be the responsible thing for the government to do in the interest of the taxpayer, it ignores the long-term benefits to the Australian people that will extend decades into the future.

The cost of the NBN project may seem daunting to the average Australian, and for the government who must divert funding from other important projects to the NBN. Understandably, the strategic review places a prominent focus on the cost of the project, and various cheaper alternative technologies were considered that would provide the minimum speeds promised by the original plan. The Optimised Multi-Technology Mix is presented in the strategic review as the best alternative, as it was forecast to provide approximately \$18 billion in revenue, the largest revenue-generating scenario from all the alternatives considered.

However, society should not underestimate the potential of a complete FTTP NBN to provide economic¹ and social growth due to its technological capacity to support the high levels of interaction and data transfer that evolving businesses need to be competitive and innovative. We have already witnessed the significant benefits that the internet provides to society, connecting people internationally in an instant, and making vast collections of information readily available. The long-term structural benefits of rolling out the highest standard of NBN infrastructure available will have a significant impact on ensuring the success of Australian businesses in the future. Therefore, it is not wise to evaluate the NBN project in terms of its cost to the government or direct revenue generated in the next decade. We should instead see the project as a means of providing Australians with a basic utility that is a fundamental requirement for the technological innovations that will occur in the future.

Take for example the deployment of the electricity network in the early 1900s. Although alternative power sources such as gas were available, and installation of infrastructure was expensive, the introduction of the electricity network has been shown to be one of the most significant infrastructure investment decisions in the history of technology, providing countless economic, medical, and social benefits that have improved standards of living. The potential uses of electricity were hard to imagine at the time, but the availability of electricity brought about important changes and new inventions that could not have been predicted. Technological innovation continues to progress rapidly, and infrastructure is the basic component that makes these technologies viable.

¹ http://www.mckinsey.com/insights/high_tech_telecoms_internet/the_great_transformer

The proposed NBN is too slow

We should not underestimate the speed requirements of the future.

Focusing the NBN review on today's video consumption shows a distinct lack of vision and creativity in what could be possible with high-speed internet. Speed targets should aim well above today's entertainment consumption and think about the internet as tomorrow's economic driver.

While determining the adequacy of future speeds is difficult, it is instructive to compare speeds promised under the NBN proposal with past improvements in internet speeds over time and speeds being deployed internationally today. In the mid to late nineties, we used dial-up connections with 56 Kb/sec download speeds. In the early 2000s, we used DSL connections with 512 Kb/sec download speeds. In the past decade, we have moved from ADSL to ADSL2 and now to ADSL2+ with speeds moving from 1-8 Mb/sec, 12 Mb/sec and 24 Mb/sec, respectively.

Just as rapidly as the speed has improved, the content served has expanded to fill the available bandwidth. Some parts of the USA already have access to 1 Gb/sec internet through Google fibre². As more of the USA gets access to this technology, content will grow to match these speeds, and Australia's 100 Mb/sec download speeds will be insufficient to access the types of services that will be regularly available to people in other countries with faster internet connections.

Given the rapid changes occurring in society's utilisation of technology, it is highly likely that speeds of 100 Mb/sec will be insufficient in 2020, contrary to the claims made in the strategic review. Section 3.1.1 of the strategic review states that by 2023, the bandwidth requirements per person would only be 19 Mb/sec, and that even for a household with a 4K TV and three HD TVs, the bandwidth requirement would be less than 40 Mb/sec. The review uses these forecasts as justification for why it is sufficient to utilise the HFC network to meet the 100 Mb/sec limit.

These forecasts seem to have been made based on the assumption that most people only use the internet primarily for entertainment purposes, such as streaming HD TV and playing games. This assumption does not take into account that the internet is already essential for day-to-day activities such as education, employment and communication. A collection of use cases and personal experiences can be found in the appendix of this document. A present day university student must access their lecture notes, watch educational videos relating to the course material, submit assignments and collaborate with peers, all of which require access to an internet connection. Self-employed workers increasingly use the internet as a means of communicating with and submitting work to clients, often needing to download and upload large files. Businesses are communicating and collaborating with clients and colleagues overseas to stay competitive in an increasingly globalised world. Given the level at

² <https://fiber.google.com>

which the internet is already ingrained in our daily lives, it is difficult to imagine that the primary use for a fast broadband network in a decade is only for entertainment purposes.

The internet is a core part of our daily lives, and as such, many members of a household need access to the internet simultaneously. Therefore, it is not sufficient to predict internet usage in terms of a household with a handful of televisions streaming HD TV concurrently. We need to consider scenarios such as one parent being in a video conference with a client in the US, the other parent uploading a large file upon the completion of a project, one of the children collaboratively editing a university assignment online with a peer and another child watching a 4K video, all at the same time. In a decade, this is likely to be a typical scenario for an average household and no member of the household should need to stop their work so that the other members can complete their tasks. The speeds provided by the NBN must be able to comfortably support these types of scenarios, preferably with a buffer to accommodate for unforeseen uses of the internet in the future.

The proposed NBN is bad value for money

Spending money on upgrading the HFC network is not worthwhile given that it must later be upgraded to support 1000 Mb/sec speeds.

Using HFC networks rather than Fibre to the Premises to connect households to the internet will result in marginal increases in network speed, and does not represent a good investment of public funds.

The premise of the NBN project is to lay out the necessary infrastructure for supporting a fast broadband network that can be upgraded as necessary for decades to come, based on the bandwidth demands at the time. If the FTTP infrastructure is deployed, speeds of up to 1000 Mb/sec can be supported without requiring significant upgrades to the broadband network, due to the great potential of fibre to transmit data. In contrast, with installation of the Optimised Multi-Technology Mix approach, various upgrades to the network are required to support speeds greater than 100 Mb/sec.

As shown in Exhibit 4-4 of the strategic review, to support download speeds of 250 Mb/sec in the future, FTTN and Fibre-to-the-Distribution Point (FTTdp) components could be upgraded to FTTP with G.Fast³ technology, and the HFC component to DOCSIS 3.1/1 GHz in 2025. To support download speeds of 1000 Mb/sec, the FTTN, FTTdp and HFC components could all be upgraded to FTTP in 2030. Regardless of the upgrade path chosen, it is clear that the technologies used in the Optimised Multi-Technology Mix approach will need to be upgraded in the next decade.

The strategic review justifies the upgrade requirements by stating that a Net Present Value saving of \$2 billion can be achieved by upgrading the network later. This is another example where a larger focus is placed on the short-term cost of the project instead of the benefit to society. The choice of the Multi-Technology Mix approach is justified based on the unfounded assumption that 100 Mb/sec download speeds are more than sufficient for the next decade. It is also important to consider the alternative situation where 100 Mb/sec is insufficient, therefore requiring upgrades to the network that will take several years to complete. In this very likely scenario, the speeds provided by the NBN will always be catching up to the requirements of society, rather than having infrastructure at hand that is ready to meet rising demands on the network.

³ The G.Fast technology can enable copper to support 1000 Mb/sec.
http://www.huawei.com/ilink/en/solutions/broader-smarter/morematerial-b/HW_278065

Better upload speeds means a more useful internet

Upload speeds are just as crucial as download speeds.

Another important detail that is glossed over in the strategic review is the importance of upload speeds in determining the best possible NBN roll out strategy. Section 3.1.1 of the review states that “upstream demand in 2023 will grow from 1.1 to 2.4 Mbps for the median household and less than ~9 Mbps for the households with the highest demand.” We believe that it is a severe understatement to suggest that only double the upload speed available in the present day will be sufficient in a decade.

Upload speeds are a crucial factor for internet usage for education and work purposes. Without fast upload speeds the experience of video calls, collaborative file sharing and uploading content to cloud services will be unbearably slow and limited, as it is in the present day, limiting productivity. This is especially the case when multiple members of a household are using these functionalities at the same time. Further discussion of use cases that require fast upload speeds and the current limitations faced by self-employed Australians can be found in the appendix of this document.

Under the current circumstances, Australians have a tendency to remain consumers of content only, since contributing content is a slow and painstaking process due to network limitations. Fast upload speeds have the potential to change this behaviour and encourage Australians to express their creativity and share their works with a global audience.

Given the importance of upload speeds, we encourage NBN Co to consider increasing upload speeds even further above the 1:3 ratio of upload speeds to download speeds promised, and to choose alternatives that would allow for easy upgrades to upload speeds as the technology improves. Fibre to the Premises presents the most viable option for high upload speed potential, a factor which will significantly impact the usefulness of the NBN in Australia's future.

The proposed NBN may be unfair

The possibility of apartments not being connected to the NBN excludes a large part of the community that would benefit from the NBN.

The Optimised Multi-Technology Mix relies on giving one third of Australians internet access through the HFC option, covering premises located within the current HFC network. However, many of the residences that fall inside the HFC coverage area are apartment blocks. Apartments historically have had limited access to HFC because of the requirement for all owners to agree to, and pay for, the installation of networking cable in the building.

The NBN Co strategic review notes that under the Optimised Multi-Technology Mix the "HFC will be provided to the premises in the HFC footprint <REDACTED>⁴" (pg 97). Without knowing how HFC will be deployed, it will be impossible to determine if apartment dwellers will have the ability to join the NBN independently, or will be connected en masse by NBN Co. If telecommunications companies refuse to connect apartments independently and NBN Co does not connect all residences, some people will receive no upgrade to their current internet access under this suggested NBN model. This represents a glaring problem in the proposal of the NBN Co's strategic review.

Many Australians live in apartment buildings, either as renters or homeowners. Furthermore, an increasing percentage of the housing supply in major cities will need to be in higher density forms just to maintain current levels of affordability and access to jobs and services for our growing population. All Australians should have access to the economic, educational and social opportunities that high speed internet provides. The potential exclusion of apartment dwellers from the NBN represents a significant disadvantage to the Optimised Multi-Technology Mix proposal, and failure to discuss costs associated with apartments in HFC areas make it unclear if the savings discussed are reliable.

⁴ This sentence was redacted from the NBN Co Strategic Review

Conclusion

Australia is worth the investment

High-speed internet access is advantageous and highly beneficial to Australia even in the present day. As with the development of the electricity network in the 1900s, and the many unanticipated and exciting ways we use electricity today, we will continue to reap the benefits of having a high-speed national broadband network for a long time to come. The possibilities are numerous and the potential for growth in our economy and quality of life is hard to quantify. But the opportunities are there, if we look to the future with excitement and confidence. Achieving the best standard of communication with each other and the rest of the world is essential to our growth as a nation.

Therefore, taxpayer money can be better spent by deploying the full FTTP network as originally planned, rather than delaying the potential benefits of the NBN project by deploying a sub-standard network as proposed by the Optimised Multi-Technology Mix for short term financial benefit. Using the Optimised Multi-Technology Mix scenario will create an unfair and, more importantly, less useful and effective NBN. On the other hand, a full FTTP network will create equal opportunities for communication and collaboration in important fields of business, science and medicine.

The Future Party urges the Senate Enquiry to consider the enormous potential that is offered by the installation of a nationwide Fibre to the Premises broadband network, for the benefit of Australians. We should build the best possible NBN to ensure that Australia is well placed to take advantage of the economic benefits that the internet will bring in the coming years. Choosing to deploy an NBN which allows for higher speeds, requires less upgrades in the immediate future, and utilises the most advanced technological option, is a worthwhile investment in our country's future.

Appendix: Use cases

Enable more Australians to work from home

The lack of fast Internet upload and download speeds is one of the most prominent reasons why working from home is not common in Australia. Typically, transferring files, accessing databases and holding video conferences is too slow, frustrating and limited, which reduces the productivity of working from home. Having fast internet connections will make it more feasible to work from home, which will result in several advantages to society. Installing the best possible NBN would help to increase the potential range of the workforce, as parents and other individuals will have the opportunity to work effectively and increasingly from home, while still being in a position to look after their home situation, such as caring for children. It may also help reduce the strain on the road and public transport network if people no longer have to commute as often for work. Also, having the ability and opportunity to work remotely would allow Australians to work for companies based overseas, keeping skilled workers in the country, and result in these skilled workers developing their professional career while continuing to contribute to the national economy.

Working from home personal use case examples

The Future Party sought input from the */r/Australia* forum on the popular forum website reddit.com. Many users submitted examples of how limitations in internet connection speed limits the productivity of home business activities.

We have included some examples of these below.

Personal story 1

I work in freelance video production up in Brisbane and along with a few friends/collaborators. We shoot and edit a load of corporate work, promotional material and sports. Many of these products require multiple high quality drafts to be uploaded to the client for their approval/feedback.

We're on the fastest internet plan iiNet offers and it's still way, way too slow. It takes us upwards of 8 hours to get a HD export to them, which when you're working to a deadline is a dealbreaker.

Not only would faster upload speeds be better for local work, it would also open us up for outsourcing to and from other countries, which would create loads of business opportunities in the creative industries and other areas.

Personal story 2

Quick example from my business - I'm in data analysis (a field that's currently growing stupidly fast), and one of the big bottlenecks is transferring data between servers and between server and client computer. If we had good symmetrical speeds, I could be downloading my clients' DBs (often many gigs in size, and they're constantly getting bigger) to a local PC or cluster for my analysis and transformation work and then reuploading when I'm finished, rather than competing with other teams working on the same server (for things like visualisation etc.). Long term this would be considerably cheaper than needing to purchase time on cloud servers all of the time.

I'm just a home-office style contractor; I don't have the money for fancy big business connections, just regular consumer-grade broadband (admittedly, top-of-the-range consumer-grade broadband). Being able to get a good up/down rate would make a significant boost to my productivity.

Fast and reliable video conferencing technology for business use

Businesses are increasingly required to collaborate and communicate with colleagues and clients overseas in real time to remain competitive in a global economy. Online collaboration is particularly important for a country like Australia whose geographic placement makes it time consuming and costly for us to travel overseas to other parts of the world we frequently interact with, such as Europe and the USA. Therefore, fast internet connections are essential for productive online collaboration.

Enable access to education material to the wider population

Education has also moved to the online space with many universities utilising the internet to share educational resources such as lecture notes, video streams of lectures, discussion forums and interactive resources to better understand concepts taught in lectures, including Massive Open Online Courses. While improving student engagement, the availability of this material allows students to catch up on lectures they may have missed due to illness or to revise material that they may not have understood initially. Courses offered online can also help those in remote locations to have an equal opportunity to obtain better quality education as those living closer to a large city. However, if remote education is to be a viable alternative, fast internet speeds are essential for allowing students to focus on their education without dealing with the frustrations of technological limitations.