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[Peter Gerrand](#) ^[1]

Life Member, TelSoc.

[Paul Budde](#) ^[2]

BuddeComm

[Joshua Gans](#) ^[3]

University of Toronto

[Mark Gregory](#) ^[4]

RMIT University

[Allan Horsley](#) ^[5]

Abstract

After the launch of the Liberal and National Parties (LNP)'s "fast broadband and affordable NBN" policy on 9 April, the broadest areas of difference between the major parties' NBN policies are fairly clear, and are summarised in the introduction to this article in a simple table of comparisons. However in the lead-up to the federal election in September 2013, there is huge and often bitter controversy over the potential benefits and disadvantages of each policy. To provide some enlightenment on the implications of the competing policies, TJA has assembled an NBN Policy Panel of four experienced commentators, ranging in their political sympathies from "centre left to centre right" – and none of them uncritical supporters of either policy. Their disciplines span the engineering, economics and marketing of broadband telecommunications.

Introduction

After the launch of the Liberal and National Parties (LNP)'s "fast broadband and affordable NBN" policy on 9 April, the broadest areas of difference between the major parties' NBN policies are fairly clear – as summarised in Table 1.

Feature	ALP	LNP
Common features:	Satellite access for 3% homes at 12 Mbps (later 25 Mbps) max	The same; these radio footprints are located in the downstream; fixed radio access for less densely populated, rural and remote areas of Australia
	4% homes at max 25 Mbps downstream	
Fibre to the Home	93% of premises: max 100 Mbps (or 1 Gbps on demand from 2014)	22% of premises (the ALP legacy plus new greenfields sites)
Fibre to the Node	Not applicable	71% of premises, including HFC networks
Options to upgrade FttN to FttH	Not applicable	Will upgrade FttN to FttH on a 'user pays' demand basis (estimated between \$2K and \$5K per user)
Wholesale pricing	Uniform wholesale price	Variable, subject to national price cap.

Implementation	100% complete by 2021	90% to get '25 to 100 Mbps' by 2016; 90% to get '50 to 100 Mbps' by 2019
time scale		
Investment	\$44B including \$37B capex	\$29B including \$20B capex
goals		
cost		
Competition	Wholesale monopoly in owning fixed broadband access	No monopoly in wholesale fixed broadband access; excluded from retail market.
features for NBN Co	Structurally separated, excluded from fixed broadband wholesale access; decommissions its copper network; leases its ducts and pits to NBN Co.	Returns as wholesale (and retail) fixed broadband market competitor, as well as supplier of copper access to NBN Co (at price to be negotiated). Leases ducts and pits to NBN Co for legacy and 'user-pays' FTTH.
Role of Telstra		

Table 1 – Brief comparison of NBN policies.

But many of the supposed costs and benefits of each policy, and its likely rollout timing, are hotly contested by the other side of politics.

To tease out the implications of the competing policies, TJA has assembled an NBN Policy Panel of four experienced commentators, ranging in their political sympathies from 'centre left to centre right', and none of them uncritical supporters of either NBN policy.

TJA: What are the likely implications of the Coalition's FTTN policy versus the current FTTP policy, for (a) consumers (b) businesses and (c) national competitiveness?

¹⁹**Mark Gregory:** A comparison of Labor and Coalition positions for the Australian National Broadband Network (NBN) highlights the complexity of what is being offered to Australians in the lead-up to the September election.

The Coalition's technology selection differs from that made by Labor only in the decision to use FTTN as an interim step on the path to a fully optical NBN - though the Coalition has been silent on exactly when Australia would have a fully optical NBN. The argument put by the Coalition that the NBN rollout would be completed sooner and at a lower cost by using FTTN misrepresents what really matters and that is when will Australia have a fully optical network that delivers 1 Gbps or higher to customers.

The Coalition has highlighted problems with the competitive environment under the current NBN legislation and this concern is well founded. Unfortunately the Coalition's NBN policy appears to be directed towards strengthening the barriers to competition by further entrenching Telstra's dominant position, enhancing the anti-competitive mobile cellular market and ensuring that customers have to pay for the unnecessary FTTN system.

Both the Coalition and Labor remain silent on the anti-competitive telecommunications market and how, for example, legislative barriers prevent NBN Co from providing connections to vehicles or an innovative retail service provider from providing this service by piggybacking wireless technologies onto the NBN and thereby competing with the mobile operators.

For consumers the cost of the Coalition's NBN plan is likely to be more expensive than Labor's NBN over the next twenty years if the technology selections are considered in isolation. If the Coalition removes the anti-competitive practices currently enshrined in the legislation then consumers should pay less for NBN and mobile cellular connections.

For business the Coalition's NBN plan will have a negative impact that increases over time because business involvement with the digital economy will not expand as it would if businesses connect to a reliable and fast optical network capable of handling future cloud computing and data needs. Australia would fall further behind our international competitors under the Coalition's NBN plan. Over the next ten years it is vital for the nation for the telecommunications network to migrate from copper to optic fibre. Australia risks falling behind other industrialised countries in key areas such as the digital economy, health, education and innovation.

[10] **Paul Budde:** I think there are also others issues that have to do with customer/voter expectations. There are clear indications that the majority of consumers and business do like the current NBN. They also understand the long term implications and at least grasp some of the economic and social benefits that an NBN will offer, So the implications are also that both consumers and businesses will be disappointed when it becomes clear that the government's promise of FttH (now promised in more detail to half to population) will be replaced with an inferior alternative. It will be interesting to see how they will react to that. Broadband has proven to be a potent political issue in the previous two elections, people are very much educated on what all of this will mean to them.

On a national level, it is sad to see that the discussion completely revolves around speed. The real national implication here is that for the social and economic transformation of our country that we need to go through (economic reforms) we need a digital infrastructure that has large capacity, is robust, secure, and has low latency. I have so far not heard the Coalition talking about any of this in their ongoing debates on the plumbing of the NBN.

TJA: What are the competition implications of the Coalition's NBN policy versus the current policy, for Retail SPs, Telstra, other infrastructure SPs, and the NBN Co's business case?

[11] **Joshua Gans:** The big difference between the Coalition and current NBN policy concerns infrastructure-based competition. The current NBN policy involves restricting Telstra and Optus' high capacity cable networks to television broadcast (pay TV) only. Around the world these networks are finding strength in their selling of Internet services. At present, I enjoy a 100Mbps plus service here in Canada on Roger's cable network. In Australia, I was able to get speeds of 50Mbps on Telstra's cable network (and that was more than three years ago). Right now and for the near term, these technologies are highly competitive with fibre. Yet, the government proposes to prevent that competition as fibre is rolled out around the country. This will have bad outcomes for consumers who might otherwise have benefitted from the competitive pressure that a fibre network would bring. The same kinds of restrictions will effect mobile broadband under the government's plan.

The government's current moves shut down competition and put Australia back on an old path towards monopoly. As Columbia professor, Tim Wu, has written, this means that the NBN will be handed the Master Switch. And when it is privatised there will be no other criterion than profit motivating it. Instead, the Coalition gives us some hope that it will preserve competition. I should say that the government promised that too but backed away when they saw how less profitable the NBN would be. The Coalition when it was in government never moved to change the structure of the Australian telecommunications industry in favour of competition. So there is a sense that I'll believe it when I see it there. But at least the rhetoric is in the right place.

Paul Budde: The business case for the NBN is aimed at the future. It is not about the current copper and coax networks – but even here competition is failing, look at the US carriers who are closing down parts of their PSTN (copper network). The new FCC chair indicates that by 2018 the PSTN is dead. The next stage – and that is what we are talking about here in Australia – is FttH. I don't think FttH infrastructure competition on a national level makes sense. In the end both copper and coax will move to fibre; two competing FttH systems don't make sense. We tried infrastructure competition in Australia since 1996 (under a Coalition Government) and it failed miserably. However, I am more worried about retail competition as I believe the current NBN design will hamper this level of competition, with Telstra potentially again becoming the dominating retailer.

Mark Gregory: The Labor NBN plan aims to restrict infrastructure competition between NBN Co and other infrastructure providers. As a result the NBN legislation has created a skewed regulatory environment which stifles competition not only in fixed access networks but also in mobile access networks.

The decision to restrict infrastructure competition in fixed access networks was taken at a time when the plan was to install active network termination units inside all premises during the rollout. This plan has been scaled back to include the option for fibre to be terminated on the outside of the building or to be installed in the street but not run into the building. Justification for the infrastructure competition restriction was in-part to move customers from copper to fibre and thereby creating an NBN customer base.

Where this plan went wrong was to also restrict competition between the NBN and alternative fixed network operators, such as cable or fibre. The NBN legislation will be an impediment to wireless network competition and does not prevent customers from opting to utilize 4G modems at home rather than NBN connections. Future fibre-wireless (Fi-Wi) networks piggybacked onto the NBN are effectively blocked by the NBN legislation and the restriction on the NBN to not connect to any moving vehicle is the second worst telecommunications related decision made by a government in the last 50 years.

TJA: What are the broad implications for rural Australia if the Coalition's NBN policy is implemented? E.g. timing, cost, suitability of bandwidth offerings, relative disadvantage.

Paul Budde: The Coalition has indicated that it will honour the current NBN contracts; these include the fixed wireless network and the satellite network. This means that there will be no difference for people in these areas. It has also hinted that it wants to extend FttN further into regional areas; however there has been no further information on this.

Obviously the coverage of regional and rural Australia will always be the most difficult (read costly) to do. Therefore there is always a chance that investments here will be curtailed and/or that the services provided here will be of a lesser quality than in the cities. Looking around the world and indeed around Australia, those communities who 'get it' and understand the importance of the NBN for their community are always coming out on top: if you can harness the people power in the local community that provides a very powerful tool. Most of the first NBN connected communities (apart from the very first technical pilots) were those communities that had prepared themselves and presented themselves well to the Minister and NBN CO. It pays off to create an active community.

Last but not least with the Coalition turning away from FttH, communities should look at what local councils in America, Scandinavia, the Netherlands, etc. are doing. Councils here actually take over from where the federal government stops and take the roll out of FttH infrastructure into their own hands.

All around the world it becomes clear that eventually both telco and cable networks will be upgraded to fibre that means that there simply is no room for infrastructure competition. In the USA the telcos are closing down significant parts of their PSTNs and basically handing the broadband market over to the cable companies. It makes sense, especially in regional areas, to have a national utility approach towards infrastructure deployment.

Mark Gregory: The Coalition's NBN plan is a disaster for regional and remote Australia.

Under the Labor plan regional and remote areas would benefit in several ways including fixed wireless and satellites providing up to 1 Gbps by the middle of the next decade and fibre replacing degraded, dead or missing copper. Regional centres and the nearby farms urgently need fibre, yet under the Coalition's NBN plan the existing copper network will be retained for the foreseeable future. Regional and remote communities will be encouraged to come up with the money for a fibre rollout and for many communities this will not be possible with the result being a widening of the gap between telecommunications in the city and bush.

A key tenet of the Australian telecommunications environment for the past 80 years has been the principle of universal access and this is underpinned by the Universal Service Obligation. For Australia to move away from the universal service provisions to one that favors one section of Australian society over another would be a travesty and damning legacy for the Australian government responsible.

TJA: What in your view are the implications of the Coalition's NBN policy for NBN Co's business case, especially concerning costs and timing?

[12] **Allan Horsley:** The Coalition Policy of a Fibre to the Node concept will substantially reduce the cost of construction because of the ongoing use of the copper customer access network and as a consequence improve the so called business case. A greater involvement of the private sector in the construction and ownership of the infrastructure will share the commercial risk across a wider base and place less risk with the taxpayer. Roll out may be slower placing a lesser demand on the construction industry and as a consequence reduce unit costs. It needs to be remembered that more than half of the cost of the NBN is civil works and it is clear that the construction industry resources are stretched.

Paul Budde: Costs are of course a relative issue. The question with the Coalition remains, why do they want to invest close to \$30b in their version of the NBN? Is that for fast Internet access, broadcast entertainment or do they indeed like the government see this as nation building; providing a national utility that will allow the country to benefits from digital productivity.

There are no indications what the Coalition believes a government under their leadership would do with the NBN. We don't know what their views are on e-health, education, government services or digital productivity. Only when you know what you want to do with the NBN can you start designing the plumbing, not the other way around.

Mark Gregory: A business case for the NBN should include the requirement for 1 Gbps or higher access network connections for 97 per cent of Australians and at least 100 Mbps for the remainder within 10 years of project commencement.

The justification for the Coalition's NBN plan is to reduce project costs by utilizing FTTN rather than FTTP – thereby scuttling the possibility of 1 Gbps access network connections for the majority of Australians. This is a smoke and mirrors approach that cannot be justified when the costs for both approaches are considered over the anticipated system life-time of thirty years. Failure to reach early agreement with Telstra would see the time and cost of the Coalition's NBN plan blow out.

There is also a high probability that the Coalition's NBN plan might be in the courts for years and an early injunction could prevent any work from starting on the FTTN network. In 2010, Telstra justified the NBN Co agreement with a very negative assessment of the copper network and highlighted the significant ongoing maintenance costs. Under the Coalition's NBN plan, changes to the status quo are likely to benefit Telstra and this would be vigorously opposed by other carriers. The timeline for the Coalition's NBN rollout is overly optimistic and in the event of the Coalition winning government in September we should expect to hear excuses about project delays and cost increases before the end of this year.

TJA to all panel members: If you had your 'druthers', what improvements would you like to see to the current NBN policy?

Joshua Gans: Well, the competition issue is clearly one. But I actually believe that there are opportunities that come from a publicly-owned NBN that has broader goals than profitability. As Stephen King and I have written (<http://www.scribd.com/doc/32899229/Big-Bang-Telecommunications-Reform> ^[13]):

"[T]he government could also use the NBN to reduce its own costs of providing public services. For example, if internet access through the NBN is ubiquitous, then it can be used to communicate with the general public and provide a variety of government services. To ensure universality, the government may wish to make a basic broadband service (say with a speed of 1Mbps) freely available to all households. The provision of this service, together with a basic 'netbook' for low-income households, could be tendered by the government. The service could potentially pay for itself by lowering government costs in other areas such as social security and taxation."

The idea is that the government could provide a basic service, for free, and then price faster services based off of this. It is like a universal service obligation but as the network is publicly owned and nation-wide, it avoids some of the loss making distortions that might otherwise arise. This is the sort of thing that a Chifley or Whitlam spirited Labor government would do but that the recent government has lost sight of in the name of corporatisation. Interestingly, Google are offering something similar with their new Fibre network in Kansas City. There you can get a 5Mbps service forever if you pay a \$300 connection fee. They are a private company. Here we would ask the government to waive that fee.

TJA: Joshua, as the NBN is restricted to providing wholesale products only, any basic broadband service will need to be offered by a Retail Service Provider (RSP), not by NBN Co. Thus the government can only offer a subsidy towards a basic Universal Broadband Service and not provide that service itself; in which case surely such a Universal Broadband Service would need to be means tested, directly or indirectly e.g. by using relevant Centrelink prequalifications?

Joshua Gans: The NBN can write a wholesale contract that specified certain benefits if the retailer offered a free basic service. There is no reason why that can't occur. It is merely a matter of will, not of legalities. Means-testing would be impossible to administer and against the spirit of providing a free service as a public good.

Paul Budde: These are very interesting ideas and suggestions and we should try and share them with our political friends. Perhaps the end results of this panel discussion could be presented to the political parties.

Concerning my own 'druthers', I'd like to speed up the rollout of faster broadband in under-served areas, especially in outer metro areas, regional towns etc. My preferred option would be to concentrate early NBN rollouts in these areas and leave eg HFC and ADSL2+ covered areas till later. However, such a plan should be based on a visionary long term policy that will show how eventually the full network gets upgraded to FttH,



The business model for NBN Co will have to be changed so that social and economic benefits are taken into account. This means that the model is not simply based on income generated from telecoms services and would also allow NBN Co to pay more attention to infrastructure requirements for smart grids, e-health, e-education, etc.

There are good government initiatives in relation to government services being provided over the NBN. The government should use these projects and put a monetary value on the social and economic benefits of these initiatives. These monetary values should be included in the overall assessment of the total cost benefit analysis of the NBN. This should stop the silly discussions about the economic viability of NBN Co solely based on telecoms income.

I am also worried about the POI design of the network (121 POIs) which could severely hamper retail competition over the network. NBN Co had it right in the first place (with 14 POIs). The 121 POIs limit retail competition to a few players and with Telstra so cashed up this could soon again lead to Telstra domination and we all know what that means.

Mark Gregory: The current NBN plan includes a technology selection for Australia's fixed telecommunication network that should meet the nation's digital needs for the next twenty to thirty years.

Australia is a large nation and mobility is fundamental to the nation's future. The current NBN plan does not adequately integrate fixed and mobile network policy, especially taking into account the anticipated growth in public Wi-Fi networks, vehicle networks and other innovative technology solutions such as Fi-Wi (fibre-wireless).

Increased competition is needed in the telecommunications market to ensure that Australian's enjoy cost reductions whilst gaining access to improved and new capabilities. The current NBN plan stifles competition and reduces the opportunity for innovation which is a key factor in tomorrow's digital world.

Due to early unfounded fears that unlimited competition would result in companies rolling out fibre to compete with NBN Co the legislation includes barriers that will prevent companies and innovators from fully exploiting the NBN's potential.

Over the next twenty years key growth areas will include connections to vehicles, sensor networks, human apparel devices like Google glasses and a plethora of rich media applications demanding an ever increasing amount of data.

Improved security will become a major requirement for services, applications and infrastructure that connects to the NBN. The current NBN plan attempts to limit NBN Co's responsibility for services, applications and infrastructure that connects to or pass over the NBN. The segregation may appear practical but provides reduced security for the system as a whole.

The current NBN plan should be amended to take into account what the digital network will look like in twenty years. A wide ranging review should occur that aims to gather a better understanding of what the NBN will entail beyond 2030.

Allan Horsley: The greatest improvement needed for the current NBN project is for NBN Co to take responsibility for the development and promotion of beneficial applications offering a commercial perspective as well as a technology perspective.

The development and promotion of visual services in the Health and Education sectors is likely to bring about substantial benefits to individual members of the community as well as to businesses, institutions and Governments. Many more members of the Australian community need to have an understanding of what is possible when an NBN service becomes ubiquitous so they can appreciate the opportunities that will become available. The project will then develop a much more 'valued' image than is the case today where most people see the NBN as an alternative to ADSL+, and that it will deliver IP TV.

Paul Budde: Hear, hear - and we do need the Coalition to show what policies they propose here.

Mark Gregory: There is a strong rationale for a free basic NBN connection and broadband service for all Australians – a Universal Broadband Service. A Universal Broadband Service would facilitate education and participation in the digital world for Australians of low socio-economic status. Australia has a proud history of socially responsible and inclusive programs and it is important to recognize that every Australian must be provided with an equal opportunity to participate in the future digital world.

Final comments

Mark Gregory: Much of what is happening in NBN Co is shrouded in secrecy and this is counter to the principle that the NBN is a nation building project. Every Australian should participate in the process and have transparent access to details on what is being provided and why.

Interestingly the NBN is not providing a free connection 'up front' any more, for fibre connections. Under one of the many revisions there was a decision a few months ago to only put fibre past some premises and the fibre would only be run into the property when the owner signed up for a service. This pushes the actual connection responsibility onto the RSPs. So now we have three fibre installation scenarios - fibre inside the building, fibre terminated on the wall outside, and fibre running past the premises. This information is being hidden and I recently asked for details on the ratio of each in the areas that have been completed and I was told the details are not available.

I agree with other panel members in the call for the government to hold an open and broad enquiry about future telecommunication industry competition. Vested interests, especially from telecommunication systems vendors and operators have been clouding the competition debate and the lack of structured discussion amongst the political parties highlights the amount of lobbying going on in the background to the NBN debate.

As an academic I feel that it should also be mentioned that NBN Co has spectacularly failed to engage with universities and this lost opportunity to foster research and teaching links highlights the distance that NBN Co has put between itself and the rest of the community. Companies and government authorities that interact with universities gain increased exposure and the opportunity to leverage innovative ideas. Academics are constantly seeking financial support for their activities and shift their attention to organizations that are prepared to fund joint projects which means that the NBN is not on the radar for academics in the telecommunications disciplines. NBN Co should fund an annual broadband challenge that is open to innovators, universities and high schools where they can showcase new applications for broadband developed in Australia. It must be remembered by the telecommunications industry that society expects positive interaction that raises education, innovation and showcases Australian achievements.

Allan Horsley: Clarity, transparency and benefit are hardly key characteristics of the policies of the Government and Coalition with regard to the development of a National Broadband Network. As a consequence commentators, industry participants and end users are left to assume how the policies will play out and what beneficial outcomes are likely or perhaps possible. Needless to say many strange assumptions emerge.

And as highlighted in the contributions of Mark and Joshua, the creation of the physical NBN has become merged with competition policy. The consequence is a confusion of policies and outcomes.

Of most significance is the absence of the concept of Broadband SERVICES and the beneficial outcomes that could be experienced by members of the broad Australian community.

An incoming Government has the huge responsibility of bringing clarity and common sense to the developing NBN concept, given the enormous financial commitment of both the Government and Coalition positions.

As a first step the competition policy aspects of Broadband development need to be urgently reviewed. Appointment of an panel of three or four highly reputable and independent individuals, could, over a period of no more than six months and through a wide consultation process, produce a contemporary Communications Competition Framework.

In parallel with this work the Government, in conjunction with the ICT industry and the general community, must develop an Outcomes Vision and Plan which seeks to engage all Australians in what can be reasonably delivered by a fully functional NBN.

These two actions have the potential to take the cheap political attacks out of the debate and bring a focus to the realistic and sensible benefits that can flow from a well utilised national broadband infrastructure and the SERVICES it can deliver to Government, business and community end users.

Without a seriously considered 'RESTART' the NBN concept has the potential to drift along amongst the bitter attacks, inappropriate assumptions and pathetic assertions that have clouded the debate over the past year or so, resulting in an appalling waste of financial and intellectual resources.

Paul Budde: Whoever wins the election will need to clearly state why we need an NBN in the first place – why does a government need to be involved in this? In my opinion this is to create digital productivity, to better position Australia to address some of the enormous challenges that our society is facing (sustainability, environment, energy, healthcare, education and so). None of these challenges can be solved by broadband alone but equally none of these challenges can be solved without a first class broadband infrastructure. Governments should provide the vision and the policies that will steer our society and economy in this direction. This will give a clear direction for all involved in ICT to develop the best possible infrastructure solutions.

The current political debate – in particular from the Coalition - is totally focused on the plumbing. If that continues we will end up with a totally flawed plan for the future. Equally the government needs to quite dramatically change its plan, and put a far greater focus on the transformative nature of the NBN and much better recognise the social and economic benefits it will bring. Once they have done that they will be able to take a holistic approach towards the NBN ? a 20-30 year view based on high-level technology requirements for such an environment:

- The policy focus should be on the national social and economic benefits: smart cities, healthcare, smart grids, education, digital productivity, etc.
- The technical focus should be on the infrastructure's capabilities:
 - Ubiquity, affordability, low latency, high speed and high capacity.
 - Allowing for the inevitable fixed-mobile convergence (FMC).
- The competition focus should be to maximise competition on top of the infrastructure in all of its forms (similar to the electricity network – I can wire the house to my needs and can buy and use any appliance the way I see fit).

In the end (10 years from now) the basic infrastructure (national FttH plus 5G mobile) will be a national utility. It is highly unlikely that there is room for competing FttH networks. 5G will bring mobile transmitters to every corner of the street – totally integrated with the FttH infrastructure. The costs of deployment will gravitate towards mobile dominance: look how much spectrum Telstra could afford to buy – they will soon be dominant in 4G infrastructure. However, this will require universal service obligations for socially and economically underserved customers. This is not just about Internet access but about access to healthcare, education, efficient energy efficiency, e-commerce, tele-working and e-government services.

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