8 December 2017
Hong Kong

To :

Communications Market Study Team
Australian Competition & Consumer Commission

Submission on Communications Market Study Draft Report

Thank you for the opportunity to submit comments on the ACCC's Communications Market Study draft report issued on 30 October 2017.

During my career of over 30 years in the telecommunications sector, I have experienced first hand the dramatic and rapid advance of technology and how it has brought amazing benefits to our society.

In the early part of my career during the late 1980s and the 1990s, Australia was a leader in deploying new telecommunication technologies such as GSM for mobile communications and ISDN, ADSL and DOCSIS for fixed communications. These investments were driven by a bipartisan policy of opening Australia's telecommunications market to more competition and a rising demand for connectivity driven by the development of the Internet and mobile communications.

However, since the early 2000s, the fixed telecommunication sector has suffered from a lack of investment which has seen Australia fall behind international benchmarks and developments. This lack of investment was a result of Telstra's dominance of the fixed telecommunications sector. Telstra was under no competitive pressure to invest in new technologies such as VDSL and GPON using FTTN and FTTP architectures. So while demand for connectivity has continued grow strongly during the 2000s and 2010s, Australia has fallen behind most international benchmarks in terms of broadband performance.

This contrasts with mobile communications where vibrant competition between initially four, and subsequently three mobile networks, drove significant investment to keep Australia at the leading edge of mobile communications.

As the initial Chief Technology Officer of NBN Co from 2009 to 2014, I was part of a team that looked to correct this lack of investment through a bold government financed investment in FTTP, Fixed Wireless and Satellite broadband technology.

However, without bipartisan political support, it is clear this initiative is failing Australia. The Telstra monopoly has been replaced by the NBN Co monopoly. Infrastructure based competition with NBN Co is discouraged rather than embraced. Investment in broadband infrastructure is driven by political imperatives. Customer requirements, innovation and economic efficiency, the usual factors driving investment, are absent from the business model.

This situation is unsustainable.

The draft report recommends that further regulation to protect NBN Co from competition through wireless and mobile technologies should be avoided. This is commendable, but why is technology specific regulation warranted? Australia's regulatory environment moved away from technology specific regulation in the 1990s. A return to picking which technology should benefit from competition regulation is a backward step. The legislative and regulatory market protections afforded to NBN Co should be unwound as soon as possible.

New technologies, such as mobile 5G, will require substantial further investment in fibre networks. Efficient use of this substantial investment will best occur if fixed and mobile networks can share this valuable resource. Other markets are seeing consolidation and/or co-operation between fixed and mobile operators. Australia's market structure currently makes such efficient investment very difficult if not impossible.

The privatisation of NBN Co, after completing the rollout in 2020, now appears to be the next big opportunity to reform Australia's fixed telecommunications market. However, it is also a dangerous time as the quick political fix will be to privatise NBN Co as a national monopoly with significant regulatory protection against competition. This will be done to maximise the sale price and minimise the politically embarrassing financial losses on the investment funded by the Australian taxpayer.

This would perpetuate the fundamental cause of Australia's fixed telecommunications problems, that is the monopoly fixed telecommunications infrastructure market. It must be prevented at all costs.

The ACCC, through its market study and final report, must highlight and advocate more strongly the need for fundamental reforms that introduces infrastructure competition. The disaggregation of NBN Co, as recommended by the Vertigan Panel of Experts, needs to be seriously considered and advocated for by the ACCC. NBN Co's current Statement of Expectations requires it to retain optionality to allow eventual disaggregation. The ACCC should investigate and report on NBN Co's readiness for an eventual disaggregation.

It is of utmost importance that options are retained for NBN Co's disaggregation so competition can be introduced into the fixed telecommunications market in time for the necessary fibre investment in 5G and other technologies.

Please find attached my detailed comments on the draft report.

Yours sincerely,

Gary McLaren

Please note :

The views expressed in this submission are mine alone. Whilst, I am currently Chief Technology Officer of Hong Kong Broadband Network, none of the comments should be taken in anyway to be the opinions or comments from my current employer.

Submission to ACCC Communications Market Study - 2017

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Introduction

The ACCC's draft report covers the entire telecommunications sector but my comments are limited to the broadband sections and in particular the current status and future prospects for the National Broadband Network (NBN).

The draft report addresses the "immediate issues of concern" in Australia's telecommunications sector, but also attempts to look forward "over a five year horizon to form a view about the directions that policy and regulation should take".

Given the five year horizon, the report crosses over the important threshold from the current planned NBN Co build phase scheduled to finish in 2020, the initial years of a post NBN Co build market and the likely introduction of 5G mobile technology into the Australian market.

These are important transitions in the Australian market and are likely to be significant developments that need to be carefully considered rather than left to drift. This is especially the case given that Australia has embarked on a unique, regulatory heavy, wholesale monopoly dominated approach to the fixed telecommunications market.

In other comparable telecommunications markets (eg. North America and Europe) policy makers and regulators have recognised some time ago that competition at the infrastructure level is the best way to manage the ongoing march of technology in the telecommunications sector. Attempts to regulate monopoly infrastructure providers to optimise efficiency and innovation, while minimising monopoly rents as technology advances in unpredictable and rapid ways has been seen as a failure. Other jurisdictions have focussed on lowering barriers to entry for new operators and especially eliminating bottleneck facilities access (eg. access to ducts, poles, towers etc) that prevent efficient infrastructure competition.

Australia's fixed telecommunications market has followed a completely different path. NBN Co, the defacto wholesale fixed infrastructure monopoly, and Telstra, the dominant fixed retail and mobile operator, are in position to call the shots on how technology is deployed. Competition is limited at the infrastructure level with minor constraints on NBN Co in the fixed market and slightly more on Telstra in the mobile market. Convergence of fixed and mobile technologies, especially with 5G, open up new methods for competition against these dominant players if the right pro-competitive market conditions exist.

Regulators and policy makers are the largest constraints on NBN Co and Telstra's domination of the Australian market. Competition exists in the mobile and wireless markets, but with 5G networks requiring abundant access to fibre resources, it is likely that NBN Co and Telstra will dominate how 5G is rolled out in Australia.

Telstra and NBN Co have entered into detailed agreements which restrict competition between each other. Telstra has entered into a Network Preference clause for 20 years to use the NBN for fixed line services. A "non-alignment dispute mechanism" has been agreed between NBN Co and Telstra which seeks to restrict NBN Co from entering the market for the supply of mobile and retail services and Telstra from entering the market for provision of carriage services to premises (see ASX disclosure statement by Telstra on 23 June 2011 as part of initial Definitive Agreements).

As a consequence, NBN Co and Telstra should be seen to be "related" parties that have protection from the other party engaging "in activities which have the effect of substantially affecting the business of the affected [ie. other] party in particular markets" (see Telstra’s ASX disclosure cited above).

With limited competition in the retail component of the fixed broadband market it falls mostly to the regulators, such as the ACCC, to formulate and oversee policies that regulate NBN Co and Telstra in the long term interests of end users (LTIE). Due to the lack of competition, this will require regulators to make judgement calls on the types of technologies, product constructs and pricing determinations that are critical in meeting the LTIE objectives. Market forces will not be able to provide the necessary signals to drive investment, innovation and efficiency.

Is this really the long term future that the ACCC sees for ongoing regulation of the Australian fixed telecommunication market?

The ACCC's report on the telecommunications market comes at a critical time. A report that does not consider the deep structural issues in the Australian telecommunications market will be a wasted opportunity to prepare for the near future.

Policy makers and regulators need to act sooner rather than later to address these structural issues to bring back competition as the main driver of investment, innovation and efficiency in Australia's telecommunications sector. If this opportunity is not taken and settings are not put in place soon, then the next 5 to 10 years are likely to be characterised by a continuing slippage in Australia's performance against other broadband markets as market power is concentrated into the hands of NBN Co and Telstra.

My comments on the ACCC's draft report are not about the specific detail but about the missing opportunity to address Australia's systemic failure in establishing a pro-competitive market for fixed telecommunications.

Is the NBN achieving its key objectives?

What are the objectives of the large investment the Australian Government is making in the NBN?

Despite the ongoing intense political and media debate over the technologies underpinning the NBN, there is a surprisingly strong level of agreement between the objectives laid out by both Labor and Coalition parties for the NBN.

The objectives are outlined in the Statement of Expectations that are issued to NBN Co from time to time. Despite the change of government in 2013 and the subsequent change of technology directions the following objectives have remained consistent since 2010, namely :

1. *Deliver a significant improvement in broadband service quality to all Australians.*
2. *Provide higher speed broadband services at uniformly affordable prices regardless of the customer's geographic location*

Objectives 1 and 2 were set by government, and supported by a planned $50 billion taxpayer investment in NBN Co, because Australia's broadband market had failed to deliver these outcomes prior to 2009. Telstra's dominance of the fixed telecommunications market had led to minimal investment in new broadband technologies (eg. FTTN based VDSL was not introduced in Australia during the 2000s unlike most other comparable markets) and regulation of Telstra had failed to deliver improvements in service quality and performance. In 2009, the Labor Government decided to go it alone with a predominantly FTTP network build which the Coalition Government scaled back in 2013 to be a mix of FTTP, FTTN and HFC network upgrades. The deal struck with Telstra for it to be progressively structurally separated and transfer its infrastructure monopoly to NBN Co has become essentially bipartisan policy.

It is clear from the draft report and the ongoing media reports of NBN installation and service problems that objectives 1 and 2 are not currently being achieved.

The failure of Objective 1 is most clearly demonstrated by the ACCC's decision to launch a new inquiry into NBN Wholesale Service Standards on 2 November 2017. In its media release the ACCC says :

> *"We are very concerned about the high number of complaints from consumers around poor customer experiences, particularly in relation to customers connecting to NBN services and having faults repaired."*
>
> *"Many of these complaints relate to matters set out in wholesale service level standards. We will examine whether the service levels that are currently in place are appropriate and effective."*

The very fact that the ACCC needs to launch such an inquiry speaks volumes for the failure of the NBN project to meet Objective 1.

The failure of Objective 2 is most clearly demonstrated by the draft reports finding that

> *"the speed of services supplied over the NBN ... is not always meeting consumer expectations" [Section 1.4 para 3].*

The significant media attention and ongoing negative publicity that has been generated by consumer complaints regarding NBN speed issues highlights the failure on this objective.

The ACCC find three reasons for this failure as follows :

I. *the choice of speed tier by consumers,*
II. *the provisioning of connectivity virtual circuit (CVC) capacity by retail service providers, and*
III. *the capability of the fibre-to-the-node (FTTN) technology to deliver certain higher speeds can be limited*

The recent announcement, after the draft report was issued, that NBN Co will suspend new connections on the hybrid fibre coax (HFC) network due to technical problems can also be added to this list.

The ACCC's proposed solutions to the above NBN failures are to

- provide guidance to service providers regarding broadband speed claims
- introduce monitoring and reporting of broadband performance
- enforce provisions of the Australian Consumer Law to address serious or systemic failures in advertising

These solutions amount to a campaign of "naming and shaming" broadband service providers into providing better service quality and performance. NBN Co, as a wholesale service provider, is largely unaffected by these proposed solutions.

The recently announced enquiry into Wholesale Service Standards may add to these solutions by putting in place penalties on NBN Co and/or RSPs where defined service levels are not achieved.

But will these solutions have the desired impact on NBN Co and retail service providers? Aren't these solutions just more of the same that was tried with Telstra prior to 2009? Further regulation of NBN Co and retail service providers highlights that the current wholesale monopoly / retail competition framework is fundamentally failing to deliver against the LTIE objectives.

At this point in time, 8 years into the NBN era, such reliance on even more heavy handed regulation highlights the fundamental systemic problems with the overall NBN model.

This model, as summarised in NBN Co's Statement of Expectations and unchanged across Labor and Coalition governments, is characterised by 3 key principles, namely :

A. *NBN to operate as a national monopoly wholesale-only access network available on equivalent terms to access seekers.*
B. *A competitive market for retail broadband and telephony retails services on top of the NBN*

C. *Telstra will, as a result of the NBN rollout, be structurally separated in terms of its fixed broadband and telephony services*

Principles A, B and C are essentially the current means by which government policy is endeavouring to achieve Objectives 1 and 2.

On Principle A the draft report states (section 3.2.3)

> *"To help maintain the NBN's cross-subsidy arrangements, the Government has put in place, or is in the process of introducing, a number of 'level playing field' measures that are intended to reduce the incentives for the provision of alternative broadband infrastructure in lower cost to supply areas. These have included requiring particular competing fixed line networks capable of supplying high speed broadband services to be operated on a wholesale only open-access basis".*

More recently, the Government has moved to impose a levy, known as the Regional Broadband Scheme (RBS) charge, on non-NBN fixed line suppliers of high speed broadband services as a contribution to help fund the NBN Co's non-commercial fixed wireless and satellite services.

However, despite the clear anti-competitive nature of these measures that (to repeat and emphasise) "*reduce the incentives for the provision of alternative broadband infrastructure*" the ACCC declines to draw the obvious link between the lack of competitive forces on NBN Co and the current failure to meet the key NBN objectives. The only pressure on NBN Co to perform is political. If NBN Co fails to deliver the expected service quality retail service providers have minimal alternative choices.

NBN Co has been under pressure to hit its rollout targets because of the partisan debate over technology choices and the need to prove that the Multi Technology Mix policy will ensure a timely rollout. Service quality has been able to be treated as of second order importance. Objective service quality measurement is difficult as the ACCC understands given the time it has taken to develop its own broadband performance monitoring program. Without competitive constraints NBN Co has been able to run a rollout first, fix it up later strategy. Bad publicity around service quality issues is the only constraint on NBN Co. This constraint is highly inefficient and has long term impacts on the whole NBN project as the "NBN brand" is degraded and consumers become uncertain of what NBN Co will actually deliver.

The end result is that RSPs and end users desperately search for alternatives. RSPs are clearly looking for NBN bypass technologies using wireless broadband. End users are looking for mobile broadband as a substitute for fixed broadband despite the higher usage costs for large data quotas.

The NBN Co defacto wholesale model has not delivered a quality outcome in terms of network performance. The lack of alternatives has left retail service providers and end users with no other option but to complain and create a media storm. This has done irreparable damage to the NBN brand and will take years to overcome.

The draft report is also clear in its assessment of Principle B regarding the effectiveness of the retail competition on top of the NBN wholesale network.

In Section 4.2.6 the draft report states

> *"However, we consider that competition on the NBN appears to be occurring in a narrow manner, focusing primarily on price with little emphasis on differentiation on the basis of speed, service quality and performance at present. There also appears to be limited competition at the higher end of the market for 'premium' broadband services, with only Telstra supplying these offerings."*

The narrow focus of competition on price alone, with "little emphasis on differentiation on the basis of speed, service quality and performance" shows Principle B is not working towards the LTIE objectives.

As outlined below in more detail, the development of a wholesale Layer 2 Ethernet product model has not encouraged sufficient competition to develop at the retail level. The ongoing debate over the price of the Connectivity Virtual Circuit charge is masking a more fundamental competition problem. Offers to end users are characterised solely by price differentiation, with minimal choice in respect of service quality, performance or customer service. As a result, much of the investment in NBN infrastructure, is remaining unutilised.

Telstra's structural separation, Principle C above, aimed at creating a level playing field for retail competition has also been largely ineffectual.

This is highlighted by the minimal loss of market share in the broadband market and Telstra's ability to dominate the market for 'premium broadband services'.

Vertical structural separation was seen as as the holy grail of reforming the Australian telecommunications market. The experience to date with the NBN shows that this is not the case. Horizontal separation of Telstra fixed broadband assets to create viable infrastructure competition should have been the goal rather than the "stick" used to obtain leverage in the initial NBN Co and government negotiations with Telstra.

This is particularly highlighted by developments in the 5G technology area, described further below, which Telstra is in a good position to again dominate and reassert its vertical infrastructure dominance over the converged fixed and mobile market that is likely to develop in the 2020s.

The ACCC final report is an opportunity to critically analyse whether the key fundamental policy positions of the NBN project are in the Long Term Interests of End Users (LTIE).

In particular :

A. Does NBN Co's defacto wholesale monopoly result in efficient investment in the necessary broadband infrastructure?

B. Is retail competition, on top of the wholesale monopoly, ensuring consumers are able to access quality broadband services at competitive prices that deliver the expected performance for current and future applications?

C. Is Telstra's continued dominance of the broadband retail market affecting NBN Co's ability to act independently.

These are key questions that should be of prime interest to the ACCC as the competition regulator for the telecommunications sector.

Why no consideration of NBN Co's de-facto monopoly on the LTIE?

The underlying principle of the NBN model is that Australia is best served by a national monopoly wholesale-only access broadband network. This principle needs to be challenged and the ACCC as an "independent Commonwealth statutory authority" which has the important role of promoting competition is the one body which should take its mission seriously and examine whether this is in the long term interests of end users.

In most other comparable telecommunication markets it has been well recognised that competition at the infrastructure level, where economically viable, delivers the best outcomes for consumers in terms of price, quality and service levels. The argument that telecommunications networks are always natural monopolies has been debunked for over two decades.

In particular competition regulators in the United Kingdom, Canada and the United States have gone to great lengths to encourage competition at the infrastructure level in their respective markets.

The ACCC in the draft report itself says clearly that

> *“[G]reater competition from new technologies will lead to positive outcomes for consumers. This includes introducing competitive constraints on the NBN's provision of wholesale services. We consider that, where it is economically efficient, infrastructure based competition is clearly preferable and will promote the long-term interests of end-users. Actual or even potential competition between communications networks can help drive dynamic efficiencies in terms of price competition, product differentiation, innovation and timely investment.” (Section 6.1.4)*

Based on this strong argument, it would be expected that the ACCC would examine whether the current de facto monopoly status of NBN Co is a key factor in the failure of the NBN to meet the government objectives outlined above.

However, the draft report instead only considers further regulation of NBN Co and RSPs rather than investigating the potential for greater infrastructure competition to achieve the desired outcomes.

The ACCC needs to be more forceful in its proposed recommendations to improve the ability for new entrants to compete against NBN Co and thus impose competitive restraints on what NBN Co provides to the market.

In line with its statement that "infrastructure competition is preferred and will promote the long-term interests of end-users" it should begin the process of unwinding the regulations it has imposed on competitive infrastructure (ie. declaration of Superfast Broadband services) and recommend government repeal of the so-called "level playing field" provisions of the Telecommunications Act introduced in 2011. As proposed by the ACCC in the draft report it should continue to advocate that government remove industry levies to fund uneconomic services in regional and rural areas in favour of direct funding from the budget.

The ACCC's silence on this issue is also not in line with stated Coalition Government policy which is most clearly expressed in the current NBN Co Statement of Expectations which states that NBN Co "should retain options for future restructuring or disaggregation".

Disaggregation of NBN Co refers to the operational split of the FTTP, FTTN, HFC, Fixed Wireless and Satellite components of NBN Co's network in a manner which enables infrastructure competition to develop.

The Coalition Government's "Telecommunications Regulatory and Structural Reform" policy statement of December 2014 stated that options for NBN Co disaggregation "will be put in place" but the priority must be given to the rollout.

The government response to the Vertigan's Panels recommendation to disaggregate NBN Co was not one of outright dismissal of such a proposition. Instead, the government has deferred such a decision, while seeking to retain options for later disaggregation as highlighted in NBN Co's Statement of Expectations. This highlights that current government policy has not ruled out a turn to more infrastructure based competition in the future, especially as part of any future privatisation of NBN Co.

The ACCC has previously actively supported the disaggregation of NBN Co that was first raised in the Vertigan Panel Review of 2014. In his speech of 17 November 2014 at the "NBN Rebooted Conference" in Sydney, the ACCC chairman, Mr Rod Sims said :

> *"However I note the Vertigan panel's comments around the unique opportunity that presents itself at this point in time:*
>
> 'In short, [disaggregation of NBN Co] would, for the first time in Australian experience, put in place a market structure that had the potential for effective infrastructure-based competition through leveraging existing assets.'
>
> *The ACCC agrees. While in the past, the ACCC and others have advocated for the principle of infrastructure based competition, the present opportunity to shape the future market structure through control and decisions over the major infrastructure assets in this country has not previously existed."*

The ACCC chairman has also on numerous occasions put politicians and policy makers at federal and state level on notice that privatisation of government monopolies is not in the interests of Australia's consumers.

At the CEDA State of the Nation address on 23 June 2014, Mr Rod Sims highlighted the importance he placed on ensuring government privatisations are not orchestrated to minimise competition so as to maximise the one-off sale price.

> *"Privatising in ways that limit competition in order to maximise the one-off sale proceeds is the wrong way. Such an approach increases the sale proceeds by effectively taxing future generations and Australia's future competitiveness."*

This position is clearly informed by various privatisations that have taken place at federal and state levels. Indeed, the privatisation of Telstra may have been the first and most costly mistake along these lines when it was privatised with its full dominance of the fixed telecommunications market in place (after mergers of Telecom Australia and OTC in the 1990s and the success of the Pay TV wars between Foxtel and Optus under government ownership) rather than in a way that would have promoted competition. Any one-off premium that was achieved through the Telstra privatisation because of its monopoly is now being effectively cancelled out by the high cost of establishing NBN Co.

The ACCC should use this report to state clearly, given its previous statements, that NBN Co should be disaggregated and that privatisation of NBN Co should not be undertaken in a manner which reduces competition simply to raise the price of the NBN Co asset to monopolistic levels.

Furthermore, the ACCC should push for greater transparency on what actions NBN Co has taken to ensure future disaggregation remains open. Mr Sims, in his speech of 17 November 2014, said :

> *"However, the ACCC stresses that if NBN Co is not disaggregated in the near future, it is imperative that measures are put in place now to facilitate future infrastructure-based competition. In this regard NBN Co should put in place arrangements that provide for future separation of NBN Co at an appropriate time."*

Such arrangements should include internal systems, accounting and reporting arrangements. The ACCC's experience from discussions with Telstra in the 2000s should make it clear that if this is not done early it will be extremely difficult to do at a later stage. While putting in place such arrangements may come at some initial cost, the benefit of doing so when it comes to separating the business in future will be far in excess of the initial costs.

Given that NBN Co is required under its Statement of Expectations to retain options for future restructuring and disaggregation and the ACCC support for disaggregation at some future time it should be incumbent on the ACCC to enquire as to whether this optionality is in fact being implemented by NBN Co. This market study should take the opportunity to investigate and report NBN Co's progress in ensuring that disaggregation remains an option prior to any privatisation.

The ACCC should reconsider its silence in this market study on the future disaggregation of NBN Co and undertake enquiries as to whether such disaggregation or restructuring is being given the importance that it clearly deserves as part of this report.

Why consider wireless as the only competitive infrastructure to NBN Co?

The ACCC's draft report attempts to analyse the future development of the market by only considering the potential substitution of fixed broadband services by wireless broadband services.

The scenario analysis does not consider the development of fixed broadband technologies. In particular the draft report does not address the need for further investment in fibre for both NBN and non-NBN fixed networks. This is a glaring omission in a report of any telecommunications market when Australia is falling behind many comparable markets in broadband performance. Other market regulators are looking to find mechanisms to enhance competition by furthering fibre investment to compete with existing incumbent network operators. The ACCC's draft report leaves this area of major international attention in telecommunications blank and focusses entirely on wireless broadband infrastructure.

The ACCC has a role in ensuring the investment in infrastructure is efficient. On what basis is wireless the only technology capable of competing with NBN Co? Why take such a technology-specific approach when the ACCC should be looking for technology agnostic ways to promote competition? I am sure the ACCC agrees that regulation that favours particular technologies inevitably results in significant inefficiencies in future infrastructure investment and less rather than more competition.

While it is positive to see the ACCC drawing a "red line" at no further regulation of wireless infrastructure investments to protect NBN Co's commercial position, the bigger question is why have a line at all.

Best practices from other markets would ensure that NBN Co was not shielded from competition. Investments in fixed and wireless broadband infrastructure should have a similar regulatory scheme in order to avoid serious market distortions and inefficiencies. On what basis should NBN Co be protected from more efficient fibre investments by competitors but more costly wireless should be unregulated? The argument that cherry picking protection is necessary to protect NBN Co financially has been rebutted by the ACCC's preference for the cross-subsidy in uneconomic areas to be taken directly from the budget rather than industry levies. As a regulator that is looking to promote competition, the ACCC should be arguing strongly for removal of the level playing field legislative and regulatory provisions to encourage efficient fibre investment rather than protecting the NBN Co monopoly.

Furthermore, it is recognised that wireless spectrum is a finite resource that should be allocated according to those investments with the highest economic value. The spectrum auction process will be heavily distorted if fixed broadband services, that could be more efficiently serviced through fixed infrastructure, also compete for this scarce spectrum to provide substitute services. The inevitable result will be higher costs for consumers of both fixed and mobile broadband services rather than achieving efficient outcomes for both. This is especially the case since fibre investment for fixed and mobile networks is more efficient when it is shared rather than built and managed separately.

The scenario analysis in section 6.1.1 of the draft report is highly comprised because of the bias towards wireless only competition to NBN Co. As a result the likely scenario is likely to play out as follows :

(i) NBN Co as the defacto monopoly with protection from fixed line investment competition is able to charge higher prices in urban areas than if fixed broadband competition were promoted.
(ii) Competition from wireless investment to NBN Co is likely to be less than from fixed and wireless investment because of higher spectrum costs and inability to spread fibre investment infrastructure costs over wider revenue pools of fixed and mobile broadband.
(iii) The higher costs to deliver fixed broadband services will retard investment and lead to higher prices and hence result in less market growth
(iv) The lower market growth will dissuade NBN Co from investment in wireless technologies (ie. to pursue scenario 3). As a monopoly fixed line operator with no mandate to enter the more lucrative mobile broadband market it will look to limit costs rather than pursue higher revenue strategies.
(v) The low market growth and low investment by NBN Co will more likely result in Scenario 1 - the least satisfactory outcome in terms of growth and investment in necessary network infrastructure for Australia.

The only means to overcome this inferior outcome is for NBN Co to be subject to technology neutral infrastructure competition. This will drive investment and market growth rather than have it restrained by the higher costs of wireless only competition.

Reliance on retail competition is failing the Australian consumer

The sub-standard performance of the NBN is largely attributed by the CEO of NBN Co, Mr Bill Morrow, to be a result of a "land grab" by RSPs (see NBN Co defence of its CVC charging policies at https://www.nbnco.com.au/content/dam/nbnco2/documents/is-nbn-cvc-charge-to-blame-position-paper-170731.pdf).

To date, with a few exceptions, the primary marketing strategy is focused on price with little mention of data speed or quality during the peak of the day. The grab for market share means there is more competition on price, rather than quality. These are clear signs of a price war.

The ACCC concurs with this view in the draft report.

> *'However, we consider that competition on the NBN appears to be occurring in a narrow manner, focusing primarily on price with little emphasis on differentiation on the basis of speed, service quality and performance at present. There also appears to be limited competition at the higher end of the market for 'premium' broadband services, with only Telstra supplying these offerings.*

A large part of the NBN model is based on RSPs being able to differentiate services based on more than just price. The Layer 2 Ethernet Bitstream model was developed by the industry to enable retail service providers to differentiate key service attributes such as quality of service, contention ratios and Layer 3 capabilities.

It appears that the large amount of work put in by industry to define and engineer the Layer 2 Ethernet Bitstream model has been wasted as RSPs focus solely on price to differentiate their offerings.

The call for the elimination of the CVC from the product construct, if successful, would undo a large part of the work and differentiation available under the Layer 2 Ethernet Bitstream model. Without the CVC, NBN Co would more or less become a Layer 3 Internet Protocol wholesaler of internet services to RSPs. Opportunities for differentiation would disappear with NBN Co deciding what quality of service should apply. Internet performance would be largely indistinguishable from one service provider to the next.

If this is the case, and the CVC is rejected, then the obvious conclusion is that retail competition on top of a wholesale model has failed.

Indeed, the consolidation of RSPs over the last 5 years in the lead up to the NBN rollout indicates that the NBN economics favour larger RSPs over smaller RSPs. This again is opposite to the desired outcome for a retail competition led market. Lower barriers to entry should be encouraging more successful new entrants. While there are over a hundred registered RSPs with access to the NBN it is clear from the draft report that market shares are highly concentrated with 94% of services shared between only four operators.

This concentration was expected after the ACCC's decision to implement 121 Points of Interconnect (PoIs) for the NBN across Australia. This made it difficult for small and new entrant RSPs without access to backhaul fibre links to address a national market. The dependence on the four main operators with their own backhaul infrastructure for access to the 121 PoIs has squeezed retail competition. Given that government policy was seeking to promote retail competition on top of a wholesale defacto monopoly this decision was clearly at odds with the original government policy and remains so today.

A move by NBN Co into the backhaul market, from which it was previously barred, may address some of these concerns but it is difficult to see this significantly moving market shares at this late stage.

Telstra's continuing high broadband market share (almost unchanged from pre NBN broadband platforms at over 50%) shows that the four operator model retains a heavy bias towards Telstra. The fact that market shares are not shifting significantly shows that innovation and differentiation are not factors that are driving customer choice.

The ACCC does seem to recognise that retail competition is not delivering the anticipated benefits for consumers but fails to consider the policy implications of this failure.

It is now becoming clear that the wholesale infrastructure monopoly / retail competition model is not working as intended. However, the draft report does not canvass alternatives that should be open for further investigation and debate. Instead it takes the view that everyone should "soldier on" rather than think more deeply about the core issues driving the underperformance of the NBN.

Telstra structural separation has not addressed likely future market dominance

A key objective of the NBN policy was to address Telstra's dominance in the fixed telecommunications market. The definitive agreements between NBN Co, Telstra and the Australian Government sealed an arrangement that would see Telstra structurally separated over time as the NBN rolled out.

However, it is now clear that this change is not affecting Telstra's dominant market share of fixed broadband services (which remains more or less unchanged at above 50%).

Furthermore, rather than increasing competition, the consolidation of RSPs during the NBN era has resulted in less retail choice for consumers.

Telstra's continuing dominance is a concern and may have flow through effects onto NBN Co which relies on Telstra for approximately 50% of its revenues. Has the ACCC considered what impact Telstra's continued dominance is having or will have on NBN Co's performance and pricing? Are NBN Co's equivalence obligations sufficient to ensure Telstra is not able to unduly influence NBN Co's behaviour.

An example of such influence may be in NBN Co's rollout of mobile backhaul services which has been slow and had little influence on the ability of Telstra's mobile competitors to access efficient mobile backhaul services in regional areas.

Is NBN Co holding back on developing and rolling out mobile backhaul services in order to appease Telstra? Does NBN Co fear that a more vibrant mobile market will stimulate investment in more capacity that will ultimately be able to compete with NBN Co for fixed broadband services? Will NBN Co support for non-Telstra mobile operators drive Telstra to invest in more 4G and 5G infrastructure which will ultimately damage NBN Co's own fixed monopoly business.

With the introduction of 5G mobile technologies, access to fibre infrastructure will be even more important to ensure vibrant competition between mobile network operators. It is becoming clear that 5G networks will rely on fibre for connecting densely located cellular radio sites to edge computing centres (see further details below).

Telstra with its ongoing access to key infrastructure such as ducts, fibre and exchange premises, is likely to dominate the Australian 5G market unless NBN Co can offer alternative fibre access arrangements to other competing mobile network operators. But will NBN Co be motivated to provide such fibre access to Telstra's competitors if it drives a more vibrant and competitive 5G market that will compete with NBN Co?

The draft report fails to consider whether the structural separation of Telstra will achieve the objective of increasing competition and improving the interests of end users over the long term.

In 5 years time (ie. 2023), with the likely rollout of 5G mobile networks gathering momentum around the world, will Telstra be the only Australian mobile operator with access to infrastructure suitable for 5G?

If NBN Co does not provide a suitable competitive fibre access model then Telstra will have retained not only its retail dominance but also its infrastructure dominance in the key mobile data growth business for the 2020s.

In my view, Telstra's ongoing access to ducts, fibre and exchange premises, will continue to allow it to dominate the Australian telecommunications market despite the structural separation that is now underway.

It is becoming clear that the structural separation of Telstra, which focussed on vertical separation and the building of a national monopoly wholesale network, has not achieved its desired outcome. Horizontal separation, through divestment of networks assets such as the Foxtel HFC assets, is necessary to achieve long lasting reform that kerbs Telstra's dominance.

Although complex and disruptive, this horizontal separation needs to be investigated in parallel with the disaggregation of NBN Co. Failure to address these fundamental reform issues will result in Telstra continuing to dominate the Australian telecommunications market and prevent sufficient competition developing to support the LTIE objectives.

NBN Co's role in a 5G future?

As stated above, mobile network operators investing in 5G networks will require significant access to fibre resources to build high density radio cell sites.

The architecture for 5G networks is still developing but it is becoming clearer that Cloud Radio Access Network (RAN) architectures are likely. These build on developments in the last 5 years of Centralised RAN architectures where the Basedband Unit (BBU) is centralised and connected via fibre to Remote Radio Heads (RRHs). The virtualisation of the BBU to enable key 5G features such as network slicing leads to the Cloud RAN architecture for 5G.

(A good primer on this new architecture and the role of fibre can be found at http://www.communicationstoday.co.in/images/reports/20170505-EXFO-wpaper073-path-5g-requires-strong-optical-network-en-report.pdf)

The separation of RRH and BBU is leading to a new use of fibre by mobile network operators (MNOs) which is now called 'fronthaul' to distinguish from the backhaul fibre used to connect BBUs (that were previously co-located with the radio cell site) back to aggregation and core networks.

Fronthaul fibre will be a key enabler of 5G technologies. This fibre is deep in the network and typically overlaps the current access networks where copper, HFC and fibre have played roles in connecting homes and offices. New 5G wireless spectrum bands, especially those in the mmWave bands, will necessitate significantly higher densities of radio cell sites. Some modelling is suggesting that cell sites will need increase at least five fold over current levels. The FCC Chairman, Tom Wheeler, highlighted this situation in the USA when he said “there may be millions of small cell sites in the 5G future” (https://apps.fcc.gov/edocs_public/attachmatch/DOC-341337A1.pdf). Only NBN Co and Telstra have access to infrastructure (mainly Telstra's duct infrastructure) that can enable fibre networks to reach this type of density.

At this stage fronthaul fibre architectures are using either dedicated point to point fibres or wavelength division multiplexing (WDM) technologies. However the scalability of these technologies is limited given high cost structures. Newer technologies are being investigated using Passive Optical Networking (PON) and Ethernet technologies. These technologies will need to sustain very high data rates to support the common public radio interface (CPRI) protocol that is used between the BBU and RRH (which may be up to 100Gbps with new massive MIMO RRHs).

How will the NBN fit into this new era of 5G mobile fronthaul requirements?

Telstra and NBN Co have entered into agreements for duct sharing that may preclude other mobile network operators from deploying the necessary fibre infrastructure directly. Telstra and NBN Co are also sharing exchange space that may be required for location of BBU equipment in a Cloud RAN architecture.

What type of products will NBN Co need to develop to enable the widespread deployment of Cloud RAN architectures by mobile network operators. Will NBN Co invest in the necessary fibre infrastructure to enable these products? Given financial constraints, NBN Co is unlikely to invest in extra fibre to facilitate competition to Telstra's 5G network by other MNOs without significant upfront financial commitments and/or extra government funding. Product development and upfront financial commitments from non-Telstra MNOs will need to be aggregated across as many operators as possible and will take significant time to negotiate and may fail all together given the complexity. Will NBN Co hold back investment so as to avoid promoting a vibrant 5G market from developing that will compete with its own fixed broadband customers?

Extra government funding for NBN Co is unlikely to be timely and will only arrive late when Telstra's dominance leads to anti-competitive outcomes. The original NBN itself is testimony to the delays and complexities of establishing the consensus necessary to deliver new fibre based products and investments in highly regulated markets. As a result, Telstra will likely have a significant first move advantage in any 5G network upgrades because of its superior fibre, duct and exchange assets.

At a more fundamental level, will the national wholesale monopoly with retail competition "on top" industry model for fixed broadband, need to be transferred to mobile networks if Telstra ends up dominating 5G network deployments. This would be a repeat of the NBN for the mobile / wireless market and require another round of structural separation of Telstra. Surely such a situation needs to be avoided at all costs given the NBN experience.

These are fundamental questions that the ACCC draft report does not address.

A continuation of the current thinking will likely result in Telstra's dominance continuing across the whole industry (fixed, wireless and mobile broadband). This would be a damning failure given the costs, delays and political pain that has been spent on the NBN project so far.

A better solution would be serious consideration of NBN Co's disaggregation and a roadmap for the eventual privatisation of NBN Co and re-negotiation of infrastructure assets that results in the horizontal separation of Telstra. This needs to be done sooner rather than later given the long road map and industry consequences of such an approach.

Way Forward

The ACCC should re-consider significant elements of its draft report and include a section in the report that advocates strongly for a restructuring of NBN Co in line with the Vertigan recommendation.

As a statutory independent competition regulator, the ACCC has a duty to promote competition wherever it is appropriate to meet the LTIE objectives. Advocacy for a restructuring of NBN Co from an economic perspective would assist in taking this issue out of the realm of partisan politics.

While it is ultimately a matter of government policy whether NBN Co is disaggregated or not, the ACCC has an important role to advocate good competition policy in advance of any political debates.

Current legislation requires a Productivity Commission review of the NBN prior to any privatisation of NBN Co. According to current government policy this will not take place until after the build of the network is finalised in 2020. The results of any review and political debate are not likely to be clear until well into the 2020s. If this is the case then the current monopoly industry framework is likely to become highly entrenched and extremely costly to restructure.

The debate on NBN Co's future structure and on ways to encourage infrastructure competition needs to be commenced as soon as possible. A re-consideration and proper advocacy in the finalised ACCC report would be of significant benefit to commencing this debate now rather than when it is too late.