



Minister for Innovation, Science and the Digital Economy
Minister for Small Business

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Mrs Lucy Wicks MP
Chair
Joint Standing Committee on the National Broadband Network
PO Box 6100
Parliament House
CANBERRA ACT 2600

Dear Mrs Wicks

I refer to your letter of 29 November 2016 to the Honourable Anastacia Palaszczuk MP, Premier and Minister the Arts inviting the Queensland Government to provide a submission to the Joint Standing Committee on the National Broadband Network (NBN) Inquiry into the rollout of the NBN.

As this matter falls within my portfolio responsibilities, the Department of Science, Information Technology and Innovation has coordinated the attached submission on behalf of the Queensland Government for consideration by the committee.

I look forward to the Committee's report on the inquiry into the rollout of the NBN.

If you require any further information, please contact Mr Jamie Merrick, Director-General, Department of Science, Information Technology and Innovation by email at jamie.merrick@dsiti.qld.gov.au or on telephone 07 3215 3700.

Yours sincerely

Leeanne Enoch MP
**Minister for Innovation, Science and the Digital Economy
and Minister for Small Business**

Encl. (1)

**Queensland Government
Submission**

**Joint Standing Committee on the National Broadband Network-
Inquiry into the roll-out of the National Broadband Network (NBN)
March 2017**

Executive Summary

KEY MESSAGES

Queensland faces unique digital infrastructure challenges

- Queensland's population is the most decentralised in Australia. Decentralisation increases the sensitivity of regional economies to infrastructure requirements; impacts on connectivity and reliability of ICT infrastructure due to distance, terrain and weather or climatic events; and elevates the need for robust telecommunications and digital infrastructure.
- Queensland continues to demonstrate a robust overall economic performance. Improvements in access to secure, reliable, cost effective digital infrastructure (i.e. NBN network) is critical for connecting people, communities and markets; for the growth and competitiveness of local economies and the creation of jobs; growth of new industry sectors; and in providing opportunities for people to improve their livelihoods and lifestyles.

Queensland Government's commitment to supporting / improving digital infrastructure

- The Queensland Government is committed to working with relevant stakeholders (i.e. NBN Co., Australian Government, Local Government and Retail Service Providers) to improve digital infrastructure for the economic and social benefit of the state.
- Regional Queensland is a particular focus of the Queensland Government. A broad range of policy initiatives and programs with a strong emphasis on providing substantial support and economic stimulus to regions are being implemented. This includes initiatives to improve digital infrastructure and related activity across much of the state.
- Key Queensland Government initiatives to support improved economic outcomes for the state and Queensland's digital economy include: the \$200 million Works for Queensland initiative, the \$375 million Building our Regions program, \$440 million Accelerated Works Program, \$180 million Significant Regional Infrastructure Projects Program and the \$300 million Priority Economic Works and Productivity Program; and the \$405 million **Advance Queensland** program.
- The Queensland Government's **State Infrastructure Plan**, as the overarching infrastructure policy framework for Queensland, has committed to the delivery of the Queensland Digital Infrastructure Plan (QDIP). The QDIP (one of five Strategic Infrastructure Documents) will guide future state digital infrastructure initiatives.
- **Advance Queensland** is an investment in Queensland's future and central to Queensland's economic growth agenda. Digital infrastructure, as well as knowledge and technologies, are key to supporting Advance Queensland's focus on building a stronger and more diversified economy, creating jobs now and for the future, and raising the standard of living for Queenslanders.
- **Advance Queensland** is a comprehensive suite of programs, based on international evidence of 'what works', designed to create the knowledge-based jobs of the future. The programs will drive innovation, build on Queensland's natural advantages, and help raise Queensland's profile as an attractive investment destination. Advance Queensland will position Queensland as a place where

entrepreneurs, industry, universities and government collaborate to turn great ideas into commercial products and businesses that create jobs.

- Access to world class digital infrastructure is critical to the success of programs, such as **Advance Queensland**, in order to address the impact of geographical distribution and to provide opportunities which assist industry to engage with major and global industry players to progress the commercialisation of technologies.
- Queensland Government agencies are continuing to adopt digital platforms and increase their use of the Internet to service citizens of Queensland. This submission provides information on agency experiences with the NBN roll-out within their service delivery activities, and identified opportunities. Examples include collaboration on initiatives for the integration of devices with NBN networks and services, and around NBN infrastructure installations. Further information is at **Attachments one and two**.
- Digital access is essential in enabling and supporting investment by the private sector in business and industry, and for business growth and productivity. High speed Internet is fundamental in supporting businesses to grow and sustain competitive advantage, and vital for households in our modern age.

Responses to the Terms of Reference of the Inquiry into the roll-out of the NBN

a. roll-out progress with particular regard to the NBN Co. Limited Statement of Expectations issued by Shareholder Ministers on 24 August 2016.

- The Queensland Government is concerned about the reported delays and budget over-runs being experienced in the NBN roll-out.
- It is difficult to comment on the status of the NBN rollout due to the non-publication of the three-year rollout plan with targets for premises passed or premises connected, making it impossible to track progress against the plan. It is unacceptable that a national project is not reporting publicly on progress against plan.
- Media reports in December 2016 regarding the Parliamentary Budget Office estimates as part of the Australian Government's Mid-Year Economic and Fiscal Outlook (December 2016) suggest a significant negative impact on the 2017-18 federal budget is likely to be experienced due to the large upfront investment and operating losses of the NBN Co.
- The Queensland Government strongly supports the NBN Co. Limited Statement of Expectations' Equity Funding Agreement cap on the maximum amount of equity funding provided by the Australian Government and for the NBN to manage costs to ensure value for money for the Australian taxpayer.
- In Queensland, there has been different progress, adoption and utilisation rates associated with the different technologies used in the NBN since the change in network design since 2013.
- Current status of Queensland NBN roll-out: As at 16 February 2017, across all of the NBN technology types, 360,012 (approximately 42%) premises in Queensland have been activated of the 860,694 premises declared Ready for Services by the NBN Co
- From 20 December 2016, the NBN Co. website commenced providing estimates of when the NBN network will be available at specific addresses. This replaces the

former 'three year construction plan' previously displayed on this website. The NBN Co. revised website (as at 27 February 2017) provides individuals and businesses with estimates, within a six month window, of when the NBN network will be available in specific areas and the type of technology expected to be rolled out. In addition, online maps provide updates the anticipated technology which will be used to roll the network out in specific search areas.

- However, the revised NBN Co. website does not provide a transparent, holistic roll-out schedule for the state which could be analysed by jurisdictions. The lack of such information inhibits gap analysis, and future digital infrastructure planning and investment decisions. This situation is suggested as not supporting the NBN Co. Limited Statement of Expectations which requires the release of updated construction plans on a regular basis.
- A number of Queensland Government departments have commenced transitioning NBN infrastructure within their facilities. Progress has been delayed in some cases due to the incompatibility of some NBN infrastructure with departmental standard equipment and where NBN equipment has not yet been fully commissioned.

b. utilisation of the national broadband network in connected localities in both metropolitan and regional areas, and the identification of opportunities to enhance economic and social benefits.

- Stable and consistent NBN services / infrastructure across the state in metropolitan, rural and remote locations is critical to government service delivery.
- A number of Queensland Government agencies currently use the various NBN technologies. Their experience are provided in **Attachment two**. There are opportunities to:
 - improve service utilisation rates, service value and reliability in regional and remote areas by installing technology to address terrain issues;
 - facilitate greater band-width for schools to address low connection issues due to data limits
 - improve the reliability of SkyMuster where more frequent outages are being experienced than in previous, interim satellite services
 - install terrestrial NBN services at sites that currently have satellite services (i.e. satellite services currently in the Department of National Parks across Queensland).

Need to invest in desirable technologies / productivity-enhancing digital infrastructure

- The Queensland Government is committed to working with local and federal governments, and with Retail Service Providers (RSPs) to facilitate digital infrastructure within the state and in particular regional areas to support liveability, employment opportunities, productivity and promotion of access to markets, as outlined in the State Infrastructure Plan.
- Adoption rates for the higher speed services (e.g. 100 Mbps where available) have been low according to NBN Co., however the pricing for these services is relatively high by international standards and higher than pre-NBN pricing for similar services (e.g. Telstra Bigpond Extreme).
- Reliable, low latency, and fast Internet access is critical to most businesses, to conduct online marketing, sales, research, communications, download software, transfer documents, use cloud services, backup data, and generally stay in-touch with the world of commerce. Any delay or inadequacy in the delivery of such

services is damaging the economy of Queensland because it is limiting the potential of Queensland business.

Need to ensure equitable access to digital infrastructure

- Despite the Statement of Expectations, the Queensland Government has significant concerns that Queensland consumers in regional and remote Queensland may not experience the same NBN service quality and continuity as consumers in metropolitan areas. The number of Queensland residents living in centres with a population below 200 people (previously used as the break-even point between satellite and FttN) is over 9 per cent. The Queensland Government would be very concerned if the original expectation of 4 percent of premises connected to satellite, was exceeded.
- The NBN should be available on an equitable basis to all Queenslanders as far as possible, including equivalent costs, performance and reliability. The widespread use of lower-grade solutions is not acceptable from an equity perspective.
- Citizens that have consistent and reliable Internet services will be able to take advantage of new services that, for example, Queensland Health are providing via digital channels.
- There is a need for the NBN network to address the poor digital infrastructure and Internet connectivity experienced in remote and discrete Queensland Aboriginal and Torres Strait Islander communities by prioritising the NBN roll-out in these areas. This will improve opportunities within these communities to use online service delivery, education and training, and business development; and facilitate a greater level of Aboriginal and Torres Strait Islander economic participation.
- Increased support (i.e. increased data allocations and no peak restrictions) for "Public Interest Premises" services is needed to support the use of NBN satellite as a viable shared service in Indigenous and remote communities.
- The Public Interest Premises (PIP) provision within the NBN allows for different pricing plans and use-cases for government, health and education premises where a single NBN service can be shared across multiple citizens. This type of model can be particularly applicable in small indigenous communities as it also better reflects the social structure/operation in these communities. The removal of the existing, restrictive hard data caps on downloads within PIPs would increase the scalability/effectiveness and viability of this model.
- A number of Queensland Regional Councils have identified the critical need for the NBN to support digital adoption and future economic development of their regions. See **Attachment three**.
- The Queensland Government welcomes opportunities to work with stakeholders in the development of specific regional solution, driven by close collaboration between governments, industry, and local communities to alleviate local impediments to digital infrastructure investment, employment and growth.

Affordability and awareness

- There is a need to ensure the affordability of NBN for consumers. Retail Service Providers (RSP) have been critical of the NBN backhaul connection charge, some claiming that it has forced an increase in retail pricing of around \$15 per month. When coupled with the possibility that an Fibre to the Node (FttN) NBN service may

not be noticeably faster than a good ADSL2+ service, there is concern about the value of an NBN service.

c. *Australia's comparative global position with regard to residential broadband infrastructure; particularly relative to other large, developed economies.*

- Australia continues to fall in the global rankings in average broadband speed and connections indicators. The fall in global rankings is due to delays in the roll-out, and changes to technology mix that have reduced the performance of the network.
- Significant work needs to be undertaken to address Australia's global ranking. Recent increases in the rate of the roll-out will help to address the coverage issue, but the use of FttN will continue to limit the performance of the network and services. Fibre-to-the-Distribution Point (FttDP) will assist in increasing the performance and allowing for future growth in capacity.

d. *national broadband network activation rates, user demand, usage patterns and trends, and any identified impediments to the take-up of national broadband network services.*

- The premises activation rates in Queensland has been less than optimal given the premises notified as declared Ready For Service (RFS). As at 16 February 2017, approximately 42 per cent of premises in Queensland have been activated of the 860,694 premises declared Ready for Services by the NBN Co.
- The Queensland Government suggests that a forward NBN construction plan is required to facilitate incumbent RSPs to progress required upgrades and maintenance. Ensuring reliable access is paramount, particularly in rural areas. A forward plan would also enable complementary parties to plan for services that might increase the uptake /use of the NBN.
- Economic growth in Queensland's industrial estates (i.e. Mount Isa, Maryborough and Cairns) may be hampered until completion of the NBN roll-out due to the reluctance of some providers to provide interim solutions addressing the increasing gap between demand and current network exchange capacity which impedes the ability to access adequate broadband services.
- The Queensland Government will work with Local Governments to further assist the NBN Co. in improving the NBN uptake and in prioritising its roll-out based on local understanding of economic and social challenges/opportunities.
- A potential impediment to the take-up of national broadband network services is the current speed tiers and utilisation constraints. Improved Internet speed at the least possible charge to the end-user would facilitate better outcomes (innovation, economic, social).

e. *any market, industry, or regulatory characteristics that may impede the efficient and cost-effective roll-out of the national broadband network.*

- Recent media reports indicate that consumers are likely to be charged an average of 17 per cent extra when they are required to switch to the NBN network from existing ADSL services. The NBN Co.'s wholesale pricing needs to be considered, as this affects retail contracts and pricing.
- Construction delays, power connection and existing copper networks are barriers to the effective roll-out of the NBN being experienced in Queensland.

- Strong NBN competition for services in rural and remote Queensland are impacting on the NBN roll-out where service providers are selecting the more profitable routes.
- In Queensland, it is suggested that satellite services are increasingly being relied upon (over other NBN technologies) due to expediency of meeting delivery targets.

f. any other matter pertaining to the national broadband network roll-out that the committee considers relevant.

Digital literacy / skills

- Digital exclusion and disadvantage is identified as coinciding with other forms of social and economic disadvantage, with those who may potentially benefit most from being connected are at greater risk of being left behind.
- Research shows that digital inclusion is lowest amongst Queenslanders who live in regional, remote and/or rural areas; seniors; Aboriginal or Torres Strait Islanders; those with a disability, the unemployed and those with lower levels of income, education and employment.
- The Queensland Government is working on digital skills and inclusion programs to elevate Queensland's rank of sixth out of the eight Australian states and territories with lower scores in the Australian Digital Inclusion Index 2016.
- The Queensland Government welcomes continued collaboration of the Australian Government to ensure access and affordability of the NBN, and in the economic growth of economies, particularly in regional Queensland.
- Increased Australian Government commitment and investment is sought to support digital inclusion, given that access to the Internet and digital technologies, and the skills to use them, is central to economic growth, social connectedness and necessary to secure many government services.

Ensuring equitable access and support

- Queensland Government departments have identified limited advice, consultation and support from NBN CO. and RSPs in assuring agency and the public's access to vital services impacted by NBN related outages or power reduction as shortcomings in the NBN roll out process.
- The Queensland Government encourages the publication of average Contention Ratios or for retail service providers (RSP) so that consumers may make an informed choice about the expected performance of the RSP's broadband service.
- Although the NBN Co. website includes registers to assist with device and NBN compatibility, cost impediments are being experienced by vulnerable Queenslanders where new or replacement devices need to be purchased.
- Information about how to sign up to the NBN in a range of formats such as easy English, Auslan, large print, and key languages, would greatly benefit people with a disability, people with literacy difficulties, people from culturally and linguistically diverse backgrounds, young people and older people.
- The affordability of the NBN for vulnerable low income groups should be monitored.
- Key Queensland Fire and Emergency Services (QFES) have highlighted the need for increased assurance that vital services impacted by NBN related outages or power

reduction can be appropriately addressed. This could be addressed by ensuring power outage mitigation for vital communications.

- QFES are significantly concerned that members of the community may have limited alternative telecommunications options, impacting on their ability to make emergency calls in fire or other life threatening situations.
- The Department of Education and Training has identified delayed repair of faults due to demarcation and responsibility issues where copper- street cabling in NBN deployed areas has now defaulted to NBN CO. for repair and restoration.
- The current Customer Service Guarantee for telecommunications is a standard designed to encourage service improvement and guard against poor service. Phone companies are required to meet minimum performance requirements for specified services and compensate customers when these are not met. Similar guarantees are currently unavailable for broadband services. This situation needs to be updated to reflect the new telecommunications model that is being implemented through the NBN.

Ensuring longitudinal research including ongoing digital economy data collection

- There is an apparent lack of published definitive baseline NBN data at the regional level. Currently all NBN related data is at the state / territory level.
- The Queensland Government suggests longitudinal research and data collection is required to address the current lack of published definitive baseline NBN data at the regional level. Currently all NBN related data is at the state / territory level.
- Regular publication of performance metrics of NBN services (i.e. availability, restoration times) are suggested to increase public confidence in the NBN
- There is a need for an independent study of the telecommunications market, particularly in regional Australia.
- The current focus of future studies conducted by the Australian Communications and Media Authority (such as Migrating to the NBN: The experience of Australian consumers) should be broadened to include all technologies used in the NBN roll-out, rather than focus exclusively on fibre-to-the-premises (FTTP).

RECOMMENDATIONS

Consumer awareness and equitable access

- The Queensland Government supports continued raising of public awareness-of the implications of the NBN rollout so that business and consumers are prepared for their transition to the NBN, and to drive the productive usage of the NBN for increased social and economic benefits to Queensland.
- The Queensland Government recommends consideration of compensation for vulnerable people who may not be able to afford a new medical alert system device / additional charges due to incompatibility issues requiring device upgrade.

- The Queensland Government encourages action to address the disadvantages of rural and remote Australians experience in terms of access, speeds, cost and reliability of their internet connections, whether they be via mobile broadband or via satellite.
- The Queensland Government strongly supports the principle that no one should be worse off in terms of cost or connectivity associated with the NBN rollout. Proposals to close down connectivity using copper in small towns due to the transition to the NBN may give many consumers an inferior service.
- The Queensland Government encourages the delivery of NBN/telecommunications infrastructure via a platform that caters for the growth expected in use of the Internet and data volumes to ensure rural, regional and remote Australia and Aboriginal and Torres Strait Islander communities are not disadvantaged.
- The Queensland Government encourages increased support (i.e. increased data allocations and no peak restrictions) for distance education students following the identification of the lack of capacity for school needs.
- The Queensland Government reiterates its recommendation regarding distance education previously expressed to the Australian Government's Regional Telecommunications Review in 2015 (<http://www.rtirc.gov.au/wp-content/uploads/sites/2/2015/10/RTIRC-Independent-Committee-Review-2015-FINAL-Low-res-version-for-website.pdf>) which states that "*Some applications (such as distance education) should be exempted from data allowance quotas, and Public Interest Premises* included in these exemptions.*"

Pricing

- The Queensland Governments seeks the Australian Government's commitment to ensure the NBN wholesale pricing arrangements which affect retail contracts and pricing do not negatively impact on consumers. The Queensland Government is concerned that increases in the wholesale charges to retail service providers are increasing costs to consumers and business without a commensurate increase in service performance.

Quality assurance

- The Australian Government should ensure that a Universal Service Obligation (USO) applies for NBN broadband services (including voice) for premises in Australia, having regard to its accessibility, affordability and performance once NBN infrastructure is fully rolled out.
- The Queensland Government encourages the publication of information that will assist consumers receive simple, standardised broadband speed information in order to accurately compare packages from different Internet Service Providers, including that from the outcomes of the Australian Competition and Consumer Commission (ACCC) speed monitoring pilot program.
- The Queensland Government encourages the publication of average Contention Ratios or for retail service providers (RSP) so that consumers may make an informed choice about the expected performance of the RSP's broadband service.

- The Queensland Government supports the re-introduction of the NBN construction plan to advise businesses and consumers of the specific technology and roll out schedule in specific areas, and for a holistic roll out schedule to assist jurisdictions in analysing gaps, and determining future digital infrastructure planning and investment decisions.
- The Queensland Government supports the widespread adoption of technologies (i.e. Fibre to the distribution point (Ftt dp) which cater for exponential future growth (i.e. growth in data download requirements) and are not limited in their life and capacity.

Introduction

The Queensland Government welcomes the Joint Standing Committee on the National Broadband Network's (the Committee) Inquiry into the roll-out of the National Broadband Network (NBN).

Although telecommunications is a constitutional responsibility of the Australian Government, the Queensland Government has great interest in the roll-out of the NBN as vital infrastructure for the social well-being and future economic growth of the state.

This Queensland Government submission provides:

- an overview of the unique digital infrastructure challenges faced within Queensland;
- Queensland's commitment to improving digital infrastructure within the state, including identified opportunities by Queensland Government agencies (**Attachment one**) and their experiences with NBN technologies (**Attachment two**);
- input from five regional council relating to the need for the NBN to support future economic development of their regions (**Attachment three**);
- responses to each of the Terms of Reference for the Committee's inquiry; and
- recommendations for consideration by the Committee.

The Queensland Government would welcome an opportunity to contribute to the annual Committee report to each House of the Parliament of Australia until the NBN is declared fully operational.

Overview of unique digital infrastructure challenges faced by Queensland

Queensland is Australia's most decentralised mainland state, with approximately 52 per cent of the population living outside the capital city statistical division.¹

In terms of population distribution, the Australian Bureau of Statistics' (2011-12) Accessibility Remoteness Index of Australia (ARIA) indicates that Queensland has approximately 82 per cent of its population living in Major Cities and Inner Regional locations.² This figure is considerably less than similar indicators for New South Wales at 93 per cent, Victoria at 95 per cent, South Australian at 85 per cent, and Western Australia at 84 per cent respectively.

Queensland's dispersed nature and its remote communities increase our reliance on telecommunication systems as a means of access to essential services. The increase in extreme

¹ [http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/3218.0Main per cent20Features302014-15?opendocument&tabname=Summary&prodno=3218.0&issue=2014-15&num=&view](http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/3218.0Main%20Features302014-15?opendocument&tabname=Summary&prodno=3218.0&issue=2014-15&num=&view)

² <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3218.02011-12?OpenDocument>

weather events in Queensland, and our tropical climate, place greater importance on the reliability of these systems.

These circumstances also present barriers to telecommunication carriers and Internet service providers, unable to capture the economies of scale that are needed to support commercially viable infrastructure at competitive prices. Unlike other states, the vast distances between many smaller communities in Queensland means that in many areas there is almost no competition between telecommunications providers because of the higher barriers to entry for new market entrants.

Although the Queensland Government is not a telecommunications services provider in its own right, the state is a major purchaser of telecommunications services from carriers. It therefore has significant leverage to engage the carriers and the Australian Government in innovative, collaborative proposals to improve telecommunications infrastructure coverage throughout the state, often well in advance of planned roll-outs.

The *Australian Government's Broadband Availability and Quality Report 2013* provides information on areas of inadequate access to broadband infrastructure across Australia. According to this report, "approximately 1.4 million premises (13 per cent) are in areas where fewer than 40 per cent of premises can access a fixed broadband service. The premises in this category are typically located in regional or remote areas of Australia, or in small pockets of poor service in metropolitan and outer metropolitan areas." Queensland has a higher proportion of premises in this under-served class due to its demographic spread.

Broadband coverage in Queensland

Broadband infrastructure available to South East Queensland and coastal communities is largely via fixed line (and wireless), and mobile telephone.^{3,4} However broadband coverage falls away as the population reduces along the east coast and in large parts of inland Queensland. This means many people living and working in regional Queensland experience poor fixed and mobile broadband services and a relatively higher proportion (compared to other jurisdictions) are dependent on satellite services when terrestrial services are no longer economic.

Despite many Queensland premises having access to satellite services, these services invariably provide a less functional customer experience, are more expensive, are subject to the vagaries of the weather, have limited capacity and high latency (delay).

Access to these different infrastructures, with varying capabilities, determines the extent to which individual Queenslanders can function as equals in the global digital or knowledge economy.

Research commissioned by the Queensland Government⁵ has found that the majority of Queenslanders are connected to the Internet via Digital Subscribers Line (DSL) technologies from fibre-enabled telephone exchanges. From the known data, the Asymmetric Digital Subscribers Line (ADSL) technology is generally available in all areas of Queensland, but not all premises in those areas have access. In many areas of rural Queensland, fewer than 40 percent of premises have access to

³ Australia's two major terrestrial mobile carriers currently claim their mobile networks cover approximately 98.5 per cent of the Australian population, these same networks only cover about one-third of Australia's landmass.

⁴ As mobile networks are shared networks, their speed and reliability is impacted by the number of network users and volumes of data being transmitted. Mobile phone networks typically offer speeds up to 30 Mbps downstream and up to 20 Mbps upstream.

⁵ Data61 – Queensland Digital Infrastructure Plan Draft Audit Report

Asymmetric Digital Subscribers Line (ADSL). Home and businesses 'just out of town' - or even in pockets in towns - often remain dependent on the more limited satellite connections.

As the NBN continues to roll-out, more Queenslanders are being connected via Fibre-to-the-Node (FttN) technologies. At the end of 2016, the NBN covered an estimated 41 percent of Queensland homes, although only an estimated 17 per cent of residents in those areas had purchased an Internet service on the NBN.⁶

Satellite services are the service of last resort for Queenslanders – limited by higher-latency, lower reliability, smaller data caps and lower upload and download speeds. Less than 8 per cent of Queenslanders have purchased a satellite service on the NBN where it is available.

Telstra has the largest coverage for mobile services in Queensland, followed by Optus and Vodafone. Vodafone connects mobile services to a microwave backbone infrastructure and as a consequence is unable to offer the same capacity or coverage as the other two providers.

Internet connectivity in remote and discrete Aboriginal and Torres Strait Islander communities

Remote and discrete Aboriginal and Torres Strait Islander communities are home to around 15 per cent of Queensland's Aboriginal and Torres Strait Islander population. Poor internet connectivity limits opportunities within these communities to online service delivery, education and training, and business development.

The *Telecommunications Act 1997* requires reasonable access to telecommunications for all people in Australia on an equitable basis, wherever they reside or carry on business. It is suggested that Aboriginal and Torres Strait Islander communities may not be afforded this right due to prepaid and community based services being the norm rather than being provided with an individual household service.

Prioritising the NBN roll-out in these areas will provide support to existing businesses, allow for modern businesses and business methods to transition into these communities, generate employment, and provide infrastructure to allow for greater service delivery in areas such as education, training, health and more.

The NBN roll-out is intended to lead to significant telecommunication market reform. The improved infrastructure will enable broadband suppliers to innovate and create unique product offerings tailored to the needs of discrete communities. These specialised offers could facilitate the business needs of the discrete communities and a greater level of Aboriginal and Torres Strait Islander economic participation. These issues should also be considered in response to how the NBN is utilised in remote or discrete locations.

Responses to each of the Terms of Reference of the Joint Standing Committee Inquiry

1. Roll-out progress with particular regard to the NBN Co. Limited Statement of Expectations issued by Shareholder Ministers on 24 August 2016.

The Queensland Government notes the implementation progress of the NBN by the NBN Co. and suggests that there has been significant disruption due to the fundamental change in network design

⁶ NBN Co. Weekly Progress Reports <http://www.nbnco.com.au/corporate-information/about-nbn-co/corporate-plan/weekly-progress-report.html>

that has occurred since 2013. It is noted that the NBN roll-out uses a number of different technologies. These combine the original technology mix and the new Multi-Technology Mix (MTM) introduced in 2013, with the proposed Fibre-to-the-distribution point (FttDP) announced for some suburbs in Queensland:

- Fibre-to-the-Premises (FttP) – the original NBN technology for populated areas
- Fibre-to-the-Node (FttN) – the replacement technology for populated areas
- Hybrid Fibre-Coaxial (HFC) – the additional technology for cable television areas
- Fixed Wireless – the technology used for urban fringe
- Satellite (Sky Muster) – the technology used for remote areas and infill
- Fibre-to-the-Distribution-Point (FttDP) – a potential replacement for FttP/FttN.

Despite the NBN's aim to provide a consistent platform on top of which the Retail Service Providers could innovate, each of these technology solutions has achieved different roll-out progress rates, adoption rates, levels of use, and customer satisfaction.

Roll-out Progress in Queensland

Fibre-to-the-Premises (FttP), Fibre-to-the-Node (FttN), and Hybrid Fibre-Coaxial (HFC)

The initial roll-out of the NBN in Queensland focussed on Ipswich and Townsville trial locations using FttP. The most recent roll-out of fixed infrastructure in these areas and new residential locations has been FttN and HFC, to increase the rate of the roll-out and reduce the cost.

As at 16 February 2017 (the latest NBN Co. roll out information), 597,203 premises in Queensland have been declared Ready for Service by the NBN Co. and 270,132 (45 percent) premises have been activated using FttP, FttN and HFC technologies.⁷

Some adverse connection and service issues have been reported which have impacted on the adoption and accessibility of the NBN for Queensland consumers, especially relating to multiple visits to get connected and some reliability issues. Most of these issues are likely to relate to the change to different technologies and the introduction of the new satellite services.

Out of the three most populous Australian states, Queensland has a significant proportion of population living in settlements of 200 people or less. Queensland has 412 Urban Centres and Bounded Localities (centres to 200 population). The Rural Balance accounts for 435,871 Queenslanders or 9.12 percent of the population⁸. These Queenslanders are likely to be on the satellite service.

The effect of this dispersed demographic pattern may result in a lower percentage of FTTN coverage in Queensland, well below the national target of 93 per cent that the Australian Government has set. There is uncertainty regarding which premises get wireless and satellite which makes it difficult to determine estimated percentages with any accuracy.

The Queensland Government would be very concerned if the original expectation of 4 percent of premises connected to satellite, was exceeded.

⁷ <http://www.nbnco.com.au/content/dam/nbnco2/documents/nbn-roll-out-metrics/nbn-roll-out-metrics-16022017.pdf>

⁸ <http://www.qgso.qld.gov.au/subjects/demography/population-estimates/tables/erp-ucl-qld/index.php>

All reports indicate that FttN roll-outs in some regions (i.e. Bundaberg, Gympie and Rockhampton) are proceeding to schedule. However, anecdotal evidence indicates that in South East Queensland, FttN customers are experiencing slower speeds during peak times than they did before changing from ADSL to the NBN service. The cost to a Retail Service Provider delivering over the NBN is significantly higher than previously and this may be encouraging some Retail Service Providers to reduce the backhaul capacity provided to users, resulting in slower performance, especially during peak times.

Fixed Wireless Services

At 16 February 2017, 33 per cent of the premises covered by wireless in Queensland have been activated. The fixed wireless roll-out is reported to be generally reliable, and on, or ahead of schedule. The reported speeds are very close to what customers have been promised by service providers.

Satellite Services

At 16 February 2017, 16 per cent of the premises covered by satellite in Queensland have been activated. Monthly data allowances for satellite services are already inadequate for many customers, and much lower than fixed line services.

- The additional data allowances provided for student use are essential for adequate access to educational resources.
- Until recently, poor service due to the interim satellite service was being experienced in many rural and remote Queensland areas. The Sky Muster 1 satellite is now providing services to many remote areas. However, the service is not performing well due to software problems in the satellite platform (as publicly acknowledged by NBN Co.).
- Forecasts by NBN Co. that it may take years for the software issues to be corrected is of great concern, particularly for Queensland customers in rural and remote Queensland.⁹

2. Utilisation of the national broadband network in connected localities in both metropolitan and regional areas, and the identification of opportunities to enhance economic and social benefits.

Residential utilisation

The increasing demand by Australian consumers for digital content is driving significant change in mobile device use, services, infrastructure and content delivery, which in turn will impact on NBN infrastructure investment.¹⁰

The Australian Government's Department of Communication and the Arts has signaled that the NBN network will result in significant change to how landline phone and Internet services are provided.

⁹ https://www.itnews.com.au/news/nbn-co-admits-to-exorbitant-number-of-satellite-failures-452965?eid=1&edate=20170301&utm_source=20170301_AM&utm_medium=newsletter&utm_campaign=daily_newsletter

¹⁰ <http://www.acma.gov.au/theACMA/Newsroom/Newsroom/Media-releases/appetite-for-digital-content-drives-extensive-changes>

When NBN fixed services (FttP, FttN, HFC, and FttDP) are provided, existing voice telephone services will change to new IP Telephony services – which may be incompatible with some equipment. Existing ADSL services will be disconnected.

The NBN is also used for entertainment and recreation services such as downloading movies (e.g. Netflix, Foxtel), and this is sometimes dismissed as an inappropriate or unimportant usage of the NBN. However, just as the use of road and transport infrastructure for the purposes of entertainment or recreation is completely acceptable, use of the NBN for these purposes can be an important social good.

The number of customers opting for the highest speed services is lower than expected, and this has been cited as evidence that higher speeds are not required. It is though, more likely that the high cost of services is suppressing demand for higher speed services. This point has been widely acknowledged by commentators.

There is a need to ensure the affordability of NBN for consumers. Retail Service Providers (RSP) have been critical of the NBN backhaul connection charge, some claiming that it has forced an increase in retail pricing of around \$15 per month¹¹. When coupled with the possibility that an FttN NBN service may not be noticeably faster than a good ADSL2+ service, there is concern about the value of an NBN service.

Internet Service Providers (ISPs) previously complained that the NBN Connectivity Virtual Circuit (CVC) charge has been too high, causing ISPs to under-provision the size of the CVC, which limits the performance of the NBN service to the end user, and makes high-speed services very expensive. CVC charges were reduced by NBN Co. in June 2015.

The *Netflix effect*, is causing a dramatic increase in download volumes, with the Australian Bureau of Statistics advising that fixed-line services downloaded 1.35 million terabytes of data in the three months to 30 June 2015 - a 40 per cent rise on the same time in 2014.

Business utilisation

The Chamber of Commerce and Industry Queensland's (CCIQ's) Digital Readiness Study 2016 estimates Australia's digital economy, which relies heavily on NBN services, is now worth \$79 billion, or 5% of Gross Domestic Product (GDP).

In regional and remote Queensland, there is greater need for connectivity because of reduced access to local services. NBN services are essential to ensure all Queenslanders have equal opportunity to participate in the digital economy.

Nearly every business in Queensland is engaged in using the digital economy in some way, and any business not utilising digital channels may struggle to compete. The most fundamental digital economy tool is connectivity to the Internet via a broadband service. Virtually all other digital economy tools are reliant on Internet connectivity that is:

- Robust
- High throughput (upload and download)
- Low latency
- Affordable

Business needs good connectivity to conduct online marketing, sales, research, communications, download software, transfer documents, use cloud services, backup data, and generally stay in-

¹¹ AFR Chanticleer September 2016

touch with the world of commerce. Any delay or inadequacy in the delivery of such services is damaging the economy of Queensland because it is limiting the potential of Queensland business

The importance of digital infrastructure within regional economies

Digital infrastructure, particularly high-speed broadband is a critical component in local economies and in the transitioning of regional economies. Most regional economies are planning to embrace knowledge-intensive industries to replace the slowing activities in mining and other industries. The availability of reliable, inexpensive, and high-capacity telecommunications infrastructure is essential to the transition process. Such services are often not available in regional areas, and the NBN, when it does arrive, does not always solve the problem.¹²

The apparent widespread use of SkyMuster satellite services across regional areas is a cause for concern, given the limits placed on satellite services in terms of speed, latency, and data caps, and the potential weather effects on tropical areas. The anecdotal evidence on the performance of satellite services is that they are not performing well. The more widespread use of optical fibre-based services (FttP and FttDP) would ensure a higher capacity, more reliable, and consistent service, which would add to the ability of regional businesses to grow in the digital economy, and improve the service to a smaller number of satellite services.

It is possible that some customers who currently have good quality ADSL services, may be migrated to an inferior satellite service as the ADSL networks are shut-down due to the roll-out of the NBN.

Improving the Public Interest Premises model within remote communities

The Public Interest Premises (PIP) provision within the NBN allows for different pricing plans and use-cases for government, health and education premises where a single NBN service can be shared across multiple citizens. For example, the concept of NBN satellite service with a Wi-Fi mesh attached which is then shared for a small community, rather than requiring each citizen to get their own NBN service. This type of model can be particularly applicable in small Aboriginal and Torres Strait Islander communities.. However, existing hard data caps on downloads currently limit the scalability/effectiveness of this model. If this restriction was lifted for PIPs, as per the recommendation in the RTIRC 2015 report, then this would make this model much more viable.

3. Australia's comparative global position with regard to residential broadband infrastructure; particularly relative to other large, developed economies.

The Akamai State of the Internet Report ¹³ details how much Australia has slipped down the broadband ranking table in the past few years.

Category	Ranking in 2016 Q3	Ranking in 2013
Average Peak Broadband speed	50	32
Broadband speed faster than 4Mbps	58	44
Broadband speed faster than 10Mbps	47	37
Average connection speeds	48	44
	Note: 1 is highest	Note: 1 is highest

¹² <http://www.news.com.au/technology/online/NBN/telstra-to-publish-NBN-speed-data-in-the-wake-of-NBN-co-being-criticised-for-leaving-consumers-in-the-dark/news-story/f6bf5c371ac158e777b88b682559ef16>

¹³ <https://delimeter.com.au/2016/03/24/australia-huge-slip-global-broadband-rankings/>

Source: Akamai 'State of the Internet' <https://delimiter.com.au/2016/03/24/australia-huge-slip-global-broadband-rankings/>

Fixed broadband is a mature, well-established technology in most OECD countries.¹⁴ The challenge for policy-makers and governments is to ensure that their countries build the broadband infrastructure which will enable economic and social integration into the future.¹⁵ Governments across the OECD have moved to either incorporate fibre into existing copper networks, or replace copper networks entirely using fibre to the home.¹⁶ Australia has been slow to make the transition to fibre compared to other OECD countries.¹⁷ This submission compares residential broadband infrastructure in Australia against other large developed economies using three metrics which matter for users; namely that broadband is accessible to all, it is fast, and it is reliable.

The deployment of the National Broadband Network (NBN) through a Multi Technology Mix (MTM) aims to provide access to fast broadband throughout Australia.¹⁸ The imperative to use a mix of technologies is, to some extent, necessitated by Australia's geography. The MTM incorporates; FttP, FttN, Fibre to the Building, Hybrid Fibre Coaxial, Fixed Wireless and Sky Muster (satellite).¹⁹ The use of mixed technologies, including new fibre deployments and existing copper networks, to deliver residential broadband is broadly consistent with the approaches of other large developed economies in the OECD.²⁰

The basic distinction between residential broadband infrastructure in Australia, compared to other OECD countries, is that a greater percentage of subscriptions in Australia rely on copper networks. Predictably, there is an associated lower proportion of fibre subscriptions.²¹ Australian Bureau of Statistics (ABS) data to June 2016, confirms that 84.6 per cent of all broadband subscriptions in Australia use existing copper networks: 70.2 per cent use a Digital Service Line (DSL), while 14.4 per cent use cable.²² Across the OECD, 76.9 per cent of fixed subscriptions use copper: DSL accounts for 44.7 per cent of all subscriptions, while cable accounts for 32.2 per cent.²³

¹⁴ Werbach, K prepared for the OECD Working Party on Communication Infrastructures and Services Policy (2015) *The Development of Fixed Broadband Networks* (page 18)

¹⁵ Broadband Commission for Sustainable Development (2016) *The State of Broadband: Broadband catalysing sustainable development* (pages 8-9)

¹⁶ Werbach, K prepared for the OECD Working Party on Communication Infrastructures and Services Policy (2015) *The Development of Fixed Broadband Networks* (page 18)

¹⁷ OECD Broadband Portal: *Percentage of fibre connections in total broadband*
<http://www.oecd.org/sti/ieconomy/oecdbroadbandportal.htm> (Accessed 8 February 2017)

¹⁸ NBN blog, *What is the nbn™ Multi Technology Mix?*
<http://www.nbnco.com.au/blog/the-nbn-project/what-is-the-nbn-multi-technology-mix.html> (Accessed 15 February 2016)

¹⁹ NBN Co, *The nbn™ Multi Technology Mix (MTM)*
<http://www.nbnco.com.au/learn-about-the-nbn/network-technology.html> (Accessed 15 February 2016)

²⁰ OECD Broadband Portal: *Fixed broadband subscriptions per 100 inhabitants*
<http://www.oecd.org/sti/ieconomy/oecdbroadbandportal.htm> (Accessed 15 February 2017)

²¹ Ibid

²² ABS (2016) *Internet subscribers by type of access connection(a), for ISPs with more than 1,000 subscribers*
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8153.0Main+Features1June+per+cent202016?OpenDocument> (Accessed 15 February 2017)

²³ OECD (2017) *OECD broadband statistics update*
<http://www.oecd.org/sti/broadband/broadband-statistics-update.htm> (Accessed 15 February 2017)

Data from the ABS to June 2016 shows that 13.4 per cent of Australia's fixed broadband subscriptions were fibre; 6.5 per cent below the OECD average.²⁴ The most recent State of the Internet Report, released in September 2016 by Akamai, underlines the effects of Australia's slow transition to fibre. The report shows that at September 2016, the average connection speed in Australia is 9.6 Mbps.²⁵ This places Australia 50th in the international ranking of average broadband connection speeds, a fall of four places from the same time last year. Australia's broadband speeds significantly lag large developed economies including the US (16.3Mbps), the UK (14.9Mbps), Canada (13.8Mbps), Germany (13.7) and France (9.7Mbps).²⁶

Data from the OECD indicates that Australia's residential broadband is not achieving the same level of market penetration or accessibility, as similar countries in the OECD.²⁷ ABS data to June 2016, shows that Australia had 7,167,000 fixed broadband subscriptions.²⁸ This correlates to around 29.78 fixed broadband subscriptions per 100 inhabitants. This is only marginally higher than the OECD average of 29.76 and places Australia 20 out of 35 countries in the OECD.²⁹ Large developed economies such as France (40.9), the United Kingdom and Germany (38.5), Canada (36.8), Sweden (36.1) and New Zealand and the United States (32.5) all have broadband penetration rates exceeding Australia's.³⁰

The Queensland Government recognises that the situation in Australia is improving with fibre being rolled out by the NBN Co at a faster rate than any country in the OECD.³¹ Australia had 960,000 fibre connections at June 2016, up from 420,000 at June 2015.³² This growth in fibre reflects the implementation phase of National Broadband Network roll out. While countries across the OECD are at different stages of development, there is a deeper deployment of fibre to premises or 'the last mile' because as the OECD notes, the technology is widely regarded as future proof.³³ Australia needs to ensure that broadband infrastructure is built which enables wide participation and access to the growing digital economy.

²⁴ ABS (2016) *Internet subscribers by type of access connection(a), for ISPs with more than 1,000 subscribers*
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8153.0Main+Features1June+per+cent202016?OpenDocument>

²⁵ Akamai (2016) *State of the Internet: Q3 2016 report* (pages 24, 28 & 33)
<https://www.akamai.com/us/en/multimedia/documents/state-of-the-internet/q3-2016-state-of-the-internet-connectivity-report.pdf> (Accessed 15 February 2017)

²⁶ Ibid

²⁷ OECD, *Historical fixed broadband penetration rates*
<http://www.oecd.org/sti/broadband/broadband-statistics-update.htm> (Accessed 15 February 2017)

²⁸ OECD, *Total number of fixed broadband subscriptions*
<http://www.oecd.org/sti/broadband/broadband-statistics-update.htm> (Accessed 15 February 2017)

²⁹ OECD *Broadband Portal: Fixed broadband subscriptions per 100 inhabitants*
<http://www.oecd.org/sti/ieconomy/oecdbroadbandportal.htm> (Accessed 15 February 2017)

³⁰ Ibid

³¹ OECD *Broadband Portal: Growth of Fibre Subscriptions*
<http://www.oecd.org/sti/ieconomy/oecdbroadbandportal.htm> (Accessed 8 February 2017)

³² ABS (2016) *Internet subscribers by type of access connection(a), for ISPs with more than 1,000 subscribers*
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8153.0Main+Features1June+per+cent202016?OpenDocument>

³³ Mölleryd, B (2015), *Development of High-speed Networks and the Role of Municipal Networks*, OECD Science, Technology and Industry Policy Papers, No. 26, OECD
<http://www.oecd-ilibrary.org/docserver/download/5jrql7rvns3-en.pdf?expires=1487659774&id=id&accname=guest&checksum=D20731A90845AD03A33F9C00B20AAF35>

4. National broadband network activation rates, user demand, usage patterns and trends, and any identified impediments to the take-up of national broadband network services.

Roll-out Progress in Queensland as at 16 February 2017 (the latest data as at 28 February 2017)

	Brownfields		New Developments (Greenfields)		Satellite		Wireless		Totals	
	Premises Declared RFS* (A)	Premises Activated (D)	Lots/ Premises Passed (E)	Premises Activated (F)	Premises Covered (G)	Premises Activated (H)	Premises Covered (I)	Premises Activated (J)	Lots/ Premises RFS incl. Satellite 2 (A+E+G+I)	Premises Activated (D+F+H+J)
Week ending 16 February 2017										
QLD	597,203	270,132 (45 per cent)	70,988	41,241 (58 per cent)	93,206	14,990 (16 per cent)	99,297	33,649 (33 per cent)	860,694	360,012 (42 per cent)
AUSTRALIA	2,928,919	1,371,985 (46 per cent)	343,106	217,939 (63 per cent)	411,680	68,486 (16 per cent)	473,491	163,285 (34 per cent)	4,157,196	1,821,695 (44 per cent)

The activation rates in Queensland has been less than optimal given the premises notified as passed. Across all of the NBN technology types, approximately 42 per cent of premises declared Ready for Service (RFS) have been activated, or connected to the NBN. However, this is comparable to the activation rates at the national level.

The Queensland Government suggests that a forward NBN construction plan is required to facilitate incumbent Retail Service Providers to progress required upgrades and maintenance. Ensuring reliable access is paramount, particularly in rural areas. A forward plan would also enable complementary parties to plan for services that might increase the uptake /use of the NBN.

Economic growth in Queensland's industrial estates (i.e. Mount Isa, Maryborough and Cairns) may be hampered until completion of the NBN roll-out due to the reluctance of some providers to provide interim solutions addressing the increasing gap between demand and current network exchange capacity which impedes the ability to access adequate broadband services. A potential impediment to the take-up of national broadband network services is the

current speed tiers and utilisation constraints. Improved Internet speed at the least possible charge to the end-user would facilitate better outcomes (innovation, economic, social).

5. Any market, industry, or regulatory characteristics that may impede the efficient and cost-effective roll-out of the national broadband network.

Barriers to effective roll-out

- One of the disadvantages of FttN is that the nodes require electrical power. The connection of power to node cabinets limits the location options, and slows down the installation because of the need to negotiate with the energy authority.
- FttN uses the existing copper telephone network for the last link to the customer, and this is the worst maintained part of the sometimes-ageing copper network. This can result in poor performance in some cases.

Market, industry, or regulatory impediments

- Strong NBN competition is emerging in rural and remote areas of Queensland in the form of fixed wireless solutions being deployed by groups such as South Western Wireless and RED WiFi. These groups are experiencing strong interest in their service offerings and they are cherry-picking the most profitable routes.
- It appears that NBN Co. is relying on satellite services more and more, possibly because of the ability to roll-out services rapidly to meet delivery targets.
- This strategy can result in existing ADSL customers being forced to change to a SkyMuster satellite service with much lower performance than their ADSL service.

Department of Education and Training (DET)

The Department of Education and Training has identified the following NBN roll out issues:

- Sub-standard communication and limited liaison with NBN Co. directly, construction (build) and operations (ongoing support and information).
- Lack of dedicated contractor/s for educational institutions results in limited understanding of the scope of works required at education sites.
- The period between survey appointment and installation is currently up to six months, impacting on schools' and DET staff preparations and actions.
- No strict Service Level Agreements provided to DET by NBN, with installation timeframes and service restoration times not guaranteed.
- Difficult and limited timely access to NBN Co. Technology Choice information and costings for fibre through the node services.

DET understands its distance education students are experiencing similar challenges, as follows:

- Sky Muster satellite installations have been very ad hoc, with numerous instances where two installations at the same remote property have occurred several weeks apart, rather than one trip;
- Some applications for Sky Muster connection have been lost, while applications lodged at a later date have sometimes been connected prior to earlier dated applications in the same area.
- The NBN Co. delivery model is causing problems with lack of concise information being available at one source.

6. Any other matter pertaining to the national broadband network roll-out that the committee considers relevant.

Need to prepare for future needs

Analysis of ABS data by Data61 (CSIRO) predicts that by 2020 the total data downloaded every three months will grow from 2.10 million Terabytes to over 9 million Terabytes (showing a near exponential increase)³⁴. This evidence contradicts the frequently-expressed view that customers are not interested in higher-speed services. If the evidence shows that the data volumes are increasing, then the download speed demand must also increase over time to enable the higher download volume.

The Queensland Government is concerned that the current roll-out technology mix will leave many customers with inadequate performance in the future as data volume growth continues to rise exponentially. The use of services like FttN may satisfy existing demand for some customers, however, it leaves little room for medium-term growth. In contrast, FttDP should have great potential for growth, with an easy upgrade path to FttP, which currently has no known performance ceiling.

Currently there is a lack of an upgrade pathway from the current FttN to FttDP or FttP. The investment in FttN may potentially be wasted should upgrades to FttP or FttDP be required in future.

Need for increased support for digital inclusion

The Queensland Government encourages the use of digital technologies by government agencies, business and individuals. Government's role has expanded from being a consumer of technology to helping to prepare citizens for the future and encouraging innovation.

Digital exclusion and disadvantage is identified as coinciding with other forms of social and economic disadvantage, with those who may potentially benefit most from being connected being at greater risk of being left behind. This is particularly important within regional and remote Queensland where there is greater need for connectivity due to reduced local services, but also greater cost and logistical challenges in providing digital infrastructure, access and education.

Generally, digital inclusion – measured through access, affordability, ability or digital literacy – is lower amongst Queenslanders who are disadvantaged or from lower socio-economic backgrounds. This is consistent with the findings from other jurisdictions, both in Australia and overseas.

Research shows that digital inclusion is lowest amongst Queenslanders who live in regional, remote and/or rural areas, seniors, Aboriginal or Torres Strait Islanders, those with a disability, the unemployed and those with lower levels of income, education and employment.³⁵

Government has a role in addressing market failures by prioritising programs that support ICT-related skills development to ensure that the entire workforce has general digital literacy, skills and capabilities.

³⁴ Australian Bureau of Statistics (2016) Internet Activity, Catalogue 8153

³⁵ Thomas, J, Barraket, J, Ewing, S, MacDonald, T, Mundell, M & Tucker, J 2016, Measuring Australia's Digital Divide: The Australian Digital Inclusion Index 2016, Swinburne University of Technology, Melbourne, for Telstra

The Queensland Government is currently developing digital inclusion programs to ensure that those in the community who do not currently have adequate digital skills or use digital technologies do not fall behind or become excluded from participating in the expanding digital economy.

Enhanced support from the Australian Government regarding policy and programs at a national level is critical in the transitioning of regional Queensland economies.

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

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

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

Queensland ranks sixth out of the eight Australian states and territories, with a slightly lower ADII score. North West Queensland is amongst the least digitally included regions in Australia. In comparing Brisbane's score with the average for Country QLD, the 'Capital-Country digital divide' has widened just slightly over three years.

Issues identified by the Queensland Department of Education and Training (DET)

The Queensland Department of Education and Training has identified that fault repairs of copper street cabling in NBN deployed areas has now defaulted to NBN Co. for repair and restoration. Early experiences with faulty telephone lines have seen the repairs delayed due to demarcation and responsibility issues between the Department's RSP and NBN technicians.

Per site speed capability information for HFC and FttN needs to be articulated, e.g. If the site is a long distance from the node then the data speed available may be limited and not worthy of consideration.

The Department of Education and Training understands its distance education students are experiencing similar challenges with faults and contention, as follows:

- NBN Co. target times for fault restoration currently prevent dependence, being four days for regional areas, 10 days for remote areas and 90 days for isolated areas. This is a critical issue for Isolated Children's Parent's Association (Qld) Inc. members that are usually connected via satellite;
- NBN Co. refers customers back to RSPs, who then often blame the NBN Co. This communication failure will cause ongoing fault identification issues. Potentially a user accessed test system could help identify problem ownership between the Sky Muster satellite service and the RSP;
- Contention will become a problem. The NBN satellite and fixed wireless strategic review noted that the number of satellite premises were underestimated in the design stage. This is illustrated in the following diagram.

NBN Long Term Satellite Solution (LTSS) issues

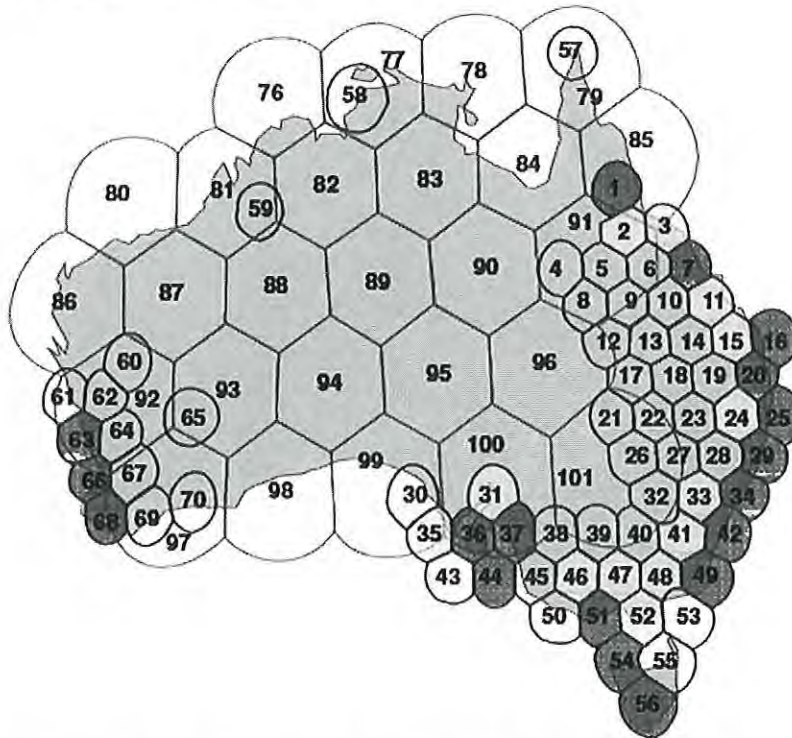


Diagram showing NBN Co. satellite beams and risk of congestion as determined in the Fixed Wireless/Satellite Strategic Review (FWSat SR). Red beams indicate severely oversubscribed satellite services with yellow beams being oversubscribed. (FWSat SR, 2014)

Issues identified by Queensland Fire and Emergency Service (QFES)

Key QFES concerns relate to limited advice, consultation and/or support in assuring both emergency services agencies and the public that have access to vital services impacted by NBN related outages or power reduction.

Power outage mitigation for vital communications

In conjunction with the Public Safety Business Agency, QFES has developed redundancy and risk mitigation measures as part of business continuity for Triple Zero communication centres. However there is more information needed to assist with understanding the degree of resources required to address impacts of power outages on QFES telecommunications in regional headquarters, regional operations centres and smaller regional centres.

For example, all communications centres have power backup support in the case of mains disruption, however, with conversion to NBN, there are matters around limited battery backup and the extra costs for fibre to premises options which agencies have had to identify, and for which NBN Co. appears not to have risk or impact recommendations to guide mitigation work.

QFES is aware that backup generation or an alternative will be required if a facility is connected to NBN so that telecommunications can be maintained. These facilities may be central to local coordination of disaster management response.

Public access and warnings

QFES remains significantly concerned that members of the community may have limited alternative telecommunications options, impacting on their ability to make emergency calls in fire or other life threatening situations.

Further, there has been very limited consultation in regard to proposed changes to community messaging to encourage the community to make alternative arrangements where possible.

The Emergency Alert system which delivers critical warning messages to the community is reliant on a functioning telecommunications system. Loss of telecommunications at the household end will impact on the effectiveness of the system, with resultant risk to the community.

Issues with Alarms and emergency lift phones

The Queensland Office of Fair Trading (OFT) advised that the roll out of the NBN and resulting switching off of the Telstra fixed line networks could result in accidental shut down of alarms and emergency lift phones that are connected to the old Telstra network.³⁶

The OFT is working with the Commonwealth Department of Communications to inform the public of policies and changes to the migration of services.

The NBN Co website has a register for building owners and managers to ensure all fire alarms and lift phone services are not disconnected and to allow the migration date to be extended to 1 July 2017.

Issues relating to the cost of medical device changeover due to incompatibility

Although the NBN Co. has an information page alerting the general public of potential incompatibility problems for certain devices due to the NBN roll out (including the medical alert systems), there may be a need for consideration for vulnerable people who may not be able to afford a new device or additional charges due to the need to changeover.

³⁶ Source: National Broadband Network affecting fire alarms and lift emergency phones (Central Queensland News Emerald 7 Oct 2016)

Attachment one

Current Queensland initiatives to improve digital infrastructure

Queensland Government State Infrastructure Plan

The Queensland Government's State Infrastructure Plan (SIP) highlights the growing dependence on digital services and the importance of digital infrastructure, including the NBN, as a fundamental enabler of social and economic development. The State Infrastructure Plan has committed to the delivery of five Strategic Infrastructure Documents one of which is focused on digital infrastructure.

Queensland Digital Infrastructure Plan

The Queensland Government is currently developing the Queensland Digital Infrastructure Plan (QDIP) as one of the plans that will inform SIP. The QDIP will identify critical gaps in Queensland's digital infrastructure, including broadband, to inform future investments by private telecommunication carriers and governments.

Opportunities from access to world-class broadband infrastructure

Advance Queensland

The Queensland Government's \$405 million Advance Queensland initiative is working to set the scene for a future Queensland today. It is a transformational agenda for change designed to spur innovation-led economic growth by translating Queensland's great ideas into commercial success.

Advance Queensland's comprehensive suite of programs, based on international evidence of 'what works', are designed to create the knowledge-based businesses and jobs of the future. The programs are investing in Queensland's rapidly emerging startup hubs across the state (Queensland has the most decentralised startup groups in Australia), growing innovation capabilities in Queensland businesses and industry sectors building on Queensland's natural advantages, and helping to raise Queensland's profile as an attractive investment destination. Advance Queensland will position Queensland as a place where entrepreneurs, industry, universities and government collaborate to turn great ideas into commercial products and businesses that create jobs. All Queensland Government agencies have a role to play in contributing to the Advance Queensland vision.

Access to world-class broadband infrastructure across the State will be a fundamental enabler of Advance Queensland program investments and international linkages.

Advancing Regional Innovation Program

The three year Advancing Regional Innovation Program aims to turn 12 designated regions across Queensland into vibrant hubs for innovation and enterprise. The program will enable local entrepreneurs, business leaders and key industries to collaborate closely with each other and with government to unlock their region's potential, strengthen existing industries and prepare regional Queenslanders for the jobs of the future.

Access to world class digital infrastructure will be critical to the success of the programs in order to address the impact of geographical distribution and provide opportunities which assist local startups, SMEs and industry to engage with national and global industry players to progress the commercialisation of ideas and technologies originating from the regions.

Advance Queensland Industry Accelerator Program

The three year Industry Accelerator Program will support high-potential startups to develop and test their innovative products and services in Queensland, under the guidance of proven accelerator

operators. Each of the accelerators will have an industry-specific focus with the intent to encourage investment by local and global players in Queensland technology to boost the productivity and competitiveness of the particular industry sectors.

Core activities of the industry accelerators will be conducted in south-east Queensland and regional centres. Each of the accelerators will need to forge connections with key industry partners who will be distributed around the state, in some cases interstate and internationally. Access to world class digital infrastructure will be a key enabler of the successful delivery of this Advance Queensland program.

Other Queensland Government agency initiatives

Department of Science Information Technology and Innovation

The Queensland Government's One Stop Shop Plan aims to make Queensland Government services simpler, clearer and faster. Affordable and equitable telecommunication services will be crucial to achieving these goals, as well as contributing to the social wellbeing and economic resilience of many Queenslanders – particularly in rural and remote communities.

Nearly all government services are now dependent on secure and reliable digital infrastructure for which the state has a strong interest in telecommunication and digital infrastructure improvements. All Queensland government agencies and Government-Owned-Corporations are planning to increase their digital footprint over the next five years.

The One Stop Shop initiative adopts a digital-first approach to improving front-line services, making it easier for people to search, find and use hundreds of Queensland Government services needed in their everyday lives. One Stop Shop uses unique digital authentication systems, integrates social media and mobile applications, and is piloting regional service outlets that consolidate the provision of a number of services to one location. Access to these services relies on the provision of reliable and reasonably priced telecommunications services across Queensland.

Queensland Health

Queensland Health is continuing to adopt digital platforms for acute clinical care as well as making extensive use of the Internet to service citizens of Queensland. The NBN offers Queensland Health and the citizens of Queensland new opportunities to address individual and community health needs, a recent example of this is the Vaccidate initiative which allows parents with smart devices to manage their children's vaccinations.

Many of Queensland Health's current initiatives and platforms, including citizen facing telehealth initiatives, allow citizens to have services supplied to their homes making use of Internet services for consultations or acute care. These services need to have the foundation of stable and consistent Internet infrastructure across the state in both metropolitan, rural and remote locations.

Such citizen facing health services require reliability and or quality of service measures, which would benefit from a customer service guarantee similar to that for phone services.

Department of Transport and Main Roads

To date the Queensland Department of Transport and Main Roads (DTMR) has migrated 53 voice services and two data services to the NBN.

DTMR has been working with NBN Co. on a number of initiatives including the integration of Intelligent Transportation Systems (ITS) devices with NBN networks and services. There is the potential for the NBN to 'future proof' the ongoing delivery of ITS services. It is considered that the

NBN platform could enable the efficient delivery of higher bandwidth and lower latency ITS services (such as CCTV and video generally).

DTMR has also been working with the NBN Co. on accessing transport corridors to support the installation of NBN infrastructure. DTMR is developing a memorandum of understanding with NBN Co. which aims to facilitate a more planned approach to minimise delays and reduce risk around NBN infrastructure installations.

Department of State Development

The North Stradbroke Island Economic Transition Strategy (September 2016), recognises that local business connectivity to high speed broadband will contribute to economic growth and job creation opportunities (e.g. by making available new channels/markets to sell products and services; promoting flexible work practices by allowing employees to login remotely; and improving access for research on best practice approaches to improve productivity and performance).

In the roll out of the NBN, the Department of State Development suggests that consideration needs to be given to:

- managing the 'whole-of-life' quality and cost of the NBN's network extension services (e.g. satellite services) to rural and remote regions (that have been traditionally disadvantaged due to location and network coverage issues) to ensure equity of internet services with major/metropolitan centres
- ensuring sites for proposed infrastructure is appropriately assessed for 'constraints' (e.g. they do not have suitable tenure; access is limited due to dense vegetation) to prevent installation delays.

Department of Communities, Child Safety and Disability Services

Issues of communication and accessible technologies are important for vulnerable cohorts. This is reflected in the strategies and action plans that have been, or are being, developed, including the Queensland: an age friendly community – Strategic direction statement and Queensland: an age friendly community – Action plan. Queensland seniors have identified the importance of accessing online information and have expressed concerns about costs relating to this.

The *Towards an all abilities Queensland* – Consultation paper, December 2016, refers to the nexus between technology and services, and digital inclusion. Responses to this consultation paper will guide the development of a new state disability plan for Queensland.

Inclusive and accessible communities, and learning and skills are two of six areas of policy action in the National Disability Strategy 2010–2020. Both of these areas involve access to online information.

Attachment two

Queensland Government agency experiences with NBN technologies

The Queensland Department of Education and Training experience

Over the past two years the Department of Education and Training has been working with NBN Co. and their construction partners to install new NBN carriage infrastructure into state owned education facilities including state schools and state owned education centres across Queensland.

To date, fixed line infrastructure has been installed into 90 schools. The NBN fixed line technology includes FttP, FttN and HFC technologies. The Department has deployed data connections at 47 FttP locations and 27 Fixed Wireless (FW) locations. The roll-out for fibre is almost complete whereas the HFC and FttN technology will be the basic connection into the remaining NBN fixed line areas. Inspection notices from NBN have been delivered to 50 schools. HFC installations have been completed at seven schools to date.

As a result of the NBN roll-out, as many as 830 schools may require an upgrade to the telephone services that are using copper based cabling such as security, fax, lift, EFTPOS and PABX lines, as NBN™ mandates their copper disconnection after installing terminal equipment. To date 150 copper services have been impacted with another 2000+ affected before the end of 2019. Affected services include digital telephone lines delivered by copper (ISDN). The impact will mean that all directory telephone lines for educational facilities, in fixed line areas, will need to be replaced with still to be developed replacement products.

For NBN carriage infrastructure DET has worked directly with the NBN Co. construction management team and their construction partners/contractors over the period, which has resulted in improved communications and a more robust process for the installation of infrastructure into educational institutions. Subsequently there have been noticeable improvements in appointment scheduling and attending appointments on time, but there is still room for improvement. The NBN contractors have also followed DET's safe working practices and guidelines with very few exceptions.

There have been a number of seemingly difficult installations, where DET is still waiting for NBN infrastructure to be installed. DET are concerned that a number of these locations have passed the copper disconnection date, requiring additional effort to obtain guarantees from NBN that these services will not be disconnected.

For copper disconnections the challenge has been working with the RSPs to connect replacement technologies onto NBN infrastructure that is compatible with departmental standard equipment. Delays have occurred when NBN equipment has not yet been fully commissioned, with DET having to leverage its relationship with the NBN Co. to expedite service connection.

Fixed Wireless (FW) utilises radio transmission from a local tower to the surrounding community requiring line-of-sight from the tower to the site antenna. Some locations have missed out due to heavy foliage or obstructions. 27 locations mainly in the Darling Downs have this technology with a data connection back to DET. It represents great value for smaller schools with low school numbers, as it is reasonably priced and data through-put has been well above the capacity of the alternative copper based services. Expansion of the coverage beyond the Darling Downs to include other small regional schools across Queensland is being considered.

NBN Co.'s Sky Muster satellite service has been widely advertised with a number of schools requesting access. With an understanding of the limitations and fair use policy, the monthly data limitation would exclude most DET schools in the footprint from a reasonable connection as the low data limits would be used up quickly during the month and a subsequent slow connection being imposed for the remainder of the month. As an example some DET schools connected with FW services and having more than 20 children are consuming more than 50GB per month in data. DET has flagged with NBN Co. the need for a semi-commercial offering to allow greater bandwidth for schools, if not unmetered.

DET understands its distance education students are experiencing additional challenges, where utilisation of the Sky Muster satellite service is dependent on reliability. Weather-related outages are a far greater problem than experienced on previous satellite services. While target reliability and speeds of "up to" may be important, actual performance is the critical factor.

Department of National Parks, Sport and Racing (DNPSR)

The Department of National Parks, Sport and Racing is responsible for National Parks across Queensland and a number of these are in remote locations where terrestrial WAN or Wireless Internet services are not available. The only current option is the Sky Muster satellite service which do not offer the same levels of network capacity or Internet speeds offered by a terrestrial service such as NBN cable or NBN Wireless. Currently there are 14 DNPSR remote sites that rely on satellite Internet services and their details are in the table below: DNPSR Sites currently on Satellite Internet Services. Currently sites with satellite services have issues with Internet reliability and performance affecting collaboration tools and some business critical Cloud applications such as the DNPSR Flame application (used for fire management control programs) are severely restricted by running over a satellite link.

Desired Future State

DNPSR Officers at remote locations require a consistent, reliable and fast Internet connection to:

- Interface with corporate business applications which assist in critical service delivery functions such as managing the parks burn programs and pest management;
- Ensure that from a workplace health and safety perspective site staff can receive and send emergency communications rapidly and reliably; and
- Access real time weather reports and fire advice notices on-demand especially in emergency situations.

Replacing Sky Muster satellite services with terrestrial based NBN Wireless or cable services would provide a faster, more reliable Internet service that significantly increases productivity and workplace health and safety benefits to DNPSR staff and park visitors. As a comparison a terrestrial service provides approximately twice the throughput of satellite services.

In addition to the benefits of DNPSR staff and park visitors, the Wireless NBN would also provide any nearby remote and Aboriginal and Torres Strait Islander people communities with the following benefits that were outlined in the NBN strategy:

- contribute to improved levels of social inclusion and social interaction;
- enable new methods of community interaction;
- promote more flexible working arrangements and improved work–life balance; and
- facilitate better access to information and digital media.

DNPSR suggest that service delivery in remote areas would greatly benefit from terrestrial NBN services at sites that currently have satellite services.

Table: NPSR Sites currently on Satellite Internet Services

Site	Site Address	Site GPS Coordinates
Blackbraes (170Km from Hughenden)	Kennedy-Development Road, Lyndhurst 4871	-19.5371, 144.2052
Elgroy - via Coen formerly Dixie NP	Dixie National Park	-15.1135, 143.3101
Epping Forest	169 Waltham Elgin Road, Elgin 4721	-22.3244, 146.751006
Heathlands	Jardine River National Park - Heathlands Section; Heathlands Resources Reserve; Heathlands QLD 4870	-11.6878, 142.7064
Homevale NP	2416 Mount Britton Road, Hail Creek 4742	-21.4399, 148.5249
Jundah (Welford NP)	Welford National Park; 4575 Jundah-Quilpie Road; Jundah QLD 4736	-25.1714, 143.3345
Lakefield NP	Lakefield Section; Lakefield National Park; Lakefield QLD 4871	-14.9268, 144.2022
Littleton NP	Littleton National Park	-18.34145, 142.5997
Moorinya NP	Moorinya NP, Torrens Creek Aramac Rd (Managed via Charters Towers Hodgkinson St)	-21.4297, 145.0495
via Blackall (Idalia NP)	Idalia National Park, Landsborough Highway; via Blackall QLD 4472	-24.9587, 144.6972

Department of Agriculture and Fisheries (DAF)

The Department of Agriculture and Fisheries recognises the social and economic benefits of the NBN to Queensland and is committed to working with rural stakeholders throughout the state.

DAF has identified that stakeholders continue to outline the limitations and failures of the NBN roll-out – satellite, fixed wireless options for the rural and remote producer. Communication from NBN about the services available and the options for producers is not effective. There needs to be better communication to, and brokerage solution for, the needs of remote and rural clients.

Key issues DAF has identified about the NBN roll-out include:

- There appears to be no recognition that remote and rural Queenslanders have specific needs that are not being addressed or met by the NBN.
- Rural Queensland is dominated by large properties that are businesses and need the communication tools that enable them to run as a business.

- There is no business grade product available on the NBN satellite roll-out. The properties are limited to a 50GB service.
- The satellite solution is deficient in its delivery when evaluated from a rural or remote agricultural businesses perspective.
- Some large rural properties can, at times, be the equivalent to a small remote community and yet the service it's offered is equivalent to that of a family household package in the city. The service packages are not suitable for a remote rural business.
- The service is reported as being notoriously unreliable. There is no back up or fall over option as the landline / copper network is being discontinued. Particularly, when there is prolonged power outages e.g. after cyclones.
- Large agricultural businesses in rural and remote Queensland require reliable services that can handle big data and enable the use of precision technologies as part of the business. Feedback is that the service cannot be relied upon.

Department of Education and Training

Rollout issues have included misinformation about the installation address of the premises, appointments not kept by installers with no follow up, and installers not being aware that the address was for a school and with little understanding that school campuses can be large and complex work environments, and the fact that the DET preferred termination location is not always the building closest to the street.

In 2013 the initial roll-out, which identified 830 sites for the fibre was significantly reduced with the new default for fixed line technology now either FttN or HFC architecture.

The emergence of HFC cabling in place of fibre as a fixed line delivery mechanism is of concern. The replacement voice and data products from providers are limited with no clear direction, especially concerning essential services and directory lines (Integrated Services Digital Network -ISDN).

DET continues to work closely with the NBN Co. directly and the nominated contractors to ensure a smooth installation with minimal disruption. This occurs in conjunction with our RSP as DET staff test and deploy new replacement products when they become available.

Department of Infrastructure, Local Government and Planning (DILGP)

The Queensland Government suggests a comprehensive forward NBN construction plan is needed to facilitate investment in digital infrastructure. Without a clear plan for the roll of the NBN in Queensland incumbent providers may choose to defer upgrades or maintenance affecting reliable access. Particularly in rural areas where reliable access can be even more important (e.g. tele-health / distance education / access to markets). Similarly the lack of a forward plan prevents complementary parties from planning for services that might increase the uptake /use of the NBN.

Even without a forward plan, there is presently a dire issue that has continued to grow particularly in some of Queensland's regional cities. An increasing gap exists between demand and current network exchange capacity with no appetite to address the issue through providing interim solutions by Telstra until the NBN arrives. This issue effectively sterilises areas of economic development due to the inability to access adequate broadband services. Economic Development Queensland's (EDQ) industrial estates in Mount Isa, Maryborough and Cairns have experienced these issues. This is in conflict with State and Australian Government priorities including the development of Northern Australia. Although it is recognised that NBN roll-out will resolve the issues, this gap hampers economic growth in the interim (i.e. potentially a further three years to meet the Australian Government's 2020 commitment for the NBN).

By working together more closely the Queensland Government and Local Governments could further assist the NBN Co. in improving the uptake by prioritising the NBN roll-out based its local understanding of economic and social challenges/opportunities. The Queensland Government's State Infrastructure Plan identified the need to:

- Engage with the Australian Government and telecommunications providers to improve digital inclusion in rural and remote parts of Queensland, including optimum coverage of the NBN; and
- Identify opportunities to address areas where mobile coverage or NBN technology is insufficient to meet community needs, particularly in public buildings like schools, health facilities and libraries.

As part of the Maturing the Infrastructure Pipeline Program, established under the State Infrastructure Fund, the Queensland Government is exploring ways to accelerate these and other opportunities in the State Infrastructure Plan. The Queensland Government would welcome further discussion with the Federal Government and the NBN Co. on progressing these opportunities.

Attachment three

Feedback from Regional areas of Queensland on the NBN roll-out, to date

Region of Queensland	Issues identified by local authorities
Barcoo	<p><u>Initiatives/Opportunities from an effective NBN roll-out</u></p> <p>There are future opportunities for local, state and federal governments and carrier co-investment in optic fibre backhaul and further mobile phone base stations in the Barcoo region. There needs to be careful consideration of relevant issues before any legislative changes are made mandating principles for inter-carrier mobile phone roaming.</p> <p><u>Impediments/Barriers to an effective NBN roll-out</u></p> <p>There needs to be broader consultation across regional Australia by the Australian Government Productivity Commission regarding the Productivity Commission Universal Service Obligation (USO) Review relating to the potential impact of a USO change and risks involved in possibly using the NBN Co. satellite or fixed wireless as a delivery platform and mechanism for a USO provided or minimum service guarantee arrangement.</p> <p>Extreme risk associated with migrating telecommunications services to communities (delivered over the copper network) or properties (i.e. delivered via point-to-point radio - HCRC, SWING, Single Channel Radio) who receive their USO guaranteed fixed telecommunications services over traditional terrestrial backhaul networks to a non-terrestrial backhaul platform. There is also seen to be a disparity in data allowances and data prices available from the NBN Co.'s Long Term Satellite Service and Internet services providers (ISPs) versus data and price available from terrestrial ISPs.</p>
Gold Coast	<p><u>Impediments/Barriers to an effective NBN roll-out</u></p> <p>There is evidence of limited engagement by NBN Co. with residents when the NBN is in a construction area. Some work has been to a very low standard in some areas with sub-contractors not meeting their quality obligations. For example, there has been inappropriate placement of cabinets within residential areas.</p>
Livingstone	<p><u>Initiatives/Opportunities from an effective NBN roll-out</u></p> <p>Until recently, the progress of the NBN roll-out has been focused on outlying rural areas and smaller townships in the Capricorn Coast area. The NBN network installation only commenced in the urban areas of the Capricorn Coast region (Yeppoon, Lammermoor, Rosslyn, Taranganba, Barlows Hill and Meikleville Hill) in late 2016. The Livingstone Council provided their community's feedback regarding the roll-out of the NBN in the region.</p>

	<p><u>Impediments/Barriers to an effective NBN roll-out</u></p> <p>There were concerns relating to the installation of NBN towers at Bondoola and Cawarral with regard to potential impacts on amenity, health and safety and perceived de-valuation of properties. There were also general concerns relating to the lack of access to NBN (not being located within the NBN roll-out coverage area); limited choice in NBN providers in the region; concerns with both the costs and speed of NBN connection versus Telstra copper wire connection (existing services) in areas that cannot access fibre optic cable and which can only access wireless NBN; in the northern areas of the region wireless NBN has reached full capacity with no allowance for new services to connect; and the amenity and access concerns regarding proposed locations of the NBN nodes.</p> <p>The Livingstone Council worked closely with the NBN Co. to facilitate and support the construction of the NBN network in the region, with the Strategic Growth and Development and Communications departments remaining in regular contact with the NBN Co.'s Community Affairs Manager.</p> <p>The Livingstone Council considers it important that, during the installation of NBN nodes, the Council and community infrastructure should experience minimal disruption and existing materials (for example pavement materials) should be replaced on a like-for-like basis.</p>
<i>Lockyer Valley</i>	<p><u>Impediments/Barriers to an effective NBN roll-out</u></p> <p>Some areas in the Lockyer Valley have experienced a lack of available ADSL services as providers have been reluctant to invest in the old infrastructure, leaving many with only mobile Internet coverage options. This lack of service availability for the former ADSL network is envisaged to continue until full NBN connectivity is completed in the region.</p> <p>There are a number of planned Fixed Wireless Towers in the Lockyer Valley requiring Development Approval with some of these applications "Impact assessable" which is leading to delays in the approval process. Some of this is attributed to misinformation within the community of the health issues and impacts of the proposed fixed wireless towers.</p> <p>There are anecdotal reports of negative experiences with the NBN in the community. For example, there is limited information about available speed and expectations of the network; frustrations with who has responsibility for what (i.e. NBN Co. or the Retail Service Providers), and who to contact if there are issues. There is also aggressive marketing from Retail Service Providers, and no clear arbitrator, when problems arise which is creating uncertainty and some confusion.</p> <p>Many businesses in the Lockyer Valley are yet to experience the roll-out of the NBN. However, those areas that are connected have identified that the changeover to the NBN have been challenging due to the complexity of their telephony and Internet services infrastructure, primarily due to compatibility issues and the ability to service customers e.g. Fire Panels, EFTPOS</p>

	machines, fax machines etc. Often, this results in a reactive approach where one change has unexpected consequences and forces other changes due to system failures.
Mareeba	<p><u>Initiatives/Opportunities from an effective NBN roll-out</u></p> <p>The Mareeba Shire Council highlighted that the adoption of communication technologies is critical to the future economic development of the Mareeba Shire and its regional liveability. The effective roll-out of the NBN is seen as key for the sustainable future of Mareeba's residents and businesses, as well as supporting the expansion and diversification of Mareeba's agricultural sector; Mareeba's tourism including connectivity for visitors; the development of Mareeba's regional logistical and services hub with national companies expanding their operations to Far North Queensland; and the improvement in the liveability in regional and remote communities through delivery of online health and education services and social connectivity.</p>

REGIONAL SUMMARY

Initiatives/Opportunities from an effective NBN roll-out

- Opportunities for local, state and federal governments and carrier co-investment in optic fibre backhaul and further mobile phone base stations
- Need to work closely with the NBN Co. to facilitate and support the construction of the NBN network in the region (eg. specialised local government units staying in regular contact with the NBN Co's Community Affairs Manager);
- Local authorities feel there should be minimal disruption and existing materials (for example pavement materials) should be replaced on a like-for-like basis.

Impediments/Barriers to an effective NBN roll-out

- Some areas have experienced a lack of available ADSL services as providers have been reluctant to invest in the old infrastructure, leaving many with only mobile Internet coverage options (this lack of service availability for the former ADSL network is envisaged to continue until full NBN connectivity is completed in that particular region);
- Needs to be careful consideration of relevant issues before any legislative changes are made mandating principles for inter-carrier mobile phone roaming;
- Needs to be broader consultation across regional Australia by the Australian Government Productivity Commission regarding the Productivity Commission Universal Service Obligation (USO) Review relating to the potential impact of a USO change and risks involved in possibly using the NBN Co. satellite or fixed wireless as a delivery platform and mechanism for a USO provided or minimum service guarantee arrangement;

- Extreme risk associated with migrating telecommunications services to communities (delivered over the copper network) or properties (delivered via point-to-point radio - HCRC, SWING, Single Channel Radio etc) who receive their USO guaranteed fixed telecommunications services over traditional terrestrial backhaul networks to a non-terrestrial backhaul platform;
- Seems to be a disparity in data allowances and data prices available from the NBN Co.'s Long Term Satellite Service and Internet services providers (ISPs) versus data and price available from terrestrial ISPs;
- Evidence of limited engagement by NBN Co. with residents in construction areas (eg. inappropriate placement of cabinets within residential areas);
- Concerns relating to the installation of NBN towers with regard to potential impacts on amenity, health and safety and perceived de-valuation of properties;
- Lack of NBN Co. 'education' of citizens (combined with misinformation within the community of the health issues and impacts of, for instance, proposed fixed wireless towers) has led to a number of planned Fixed Wireless Towers judged "Impact assessable" - leading to delays in the approval process).
- Limited information about available speed and expectations of the network and frustrations/confusion concerning who is 'accountable' for what aspects of service delivery;
- There is also aggressive marketing from Retails Service Providers, and no clear arbitrator when problems arise - which is creating uncertainty and some confusion;
- Changeover to the NBN have been challenging due to the complexity of their telephony and Internet services infrastructure, primarily due to compatibility issues and the ability to service customers e.g. Fire Panels, EFTPOS machines, fax machines.