

TELSTRA CORPORATION LIMITED

Response to the Regional Telecommunications Review 2021 Issues Paper

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Executive Summary

A thriving regional Australia is fundamentally important to Australia's success and viability both socially and economically. A thriving regional Australia is also important to Telstra. We are one of its biggest supporters and investors, a major employer, and we supply much of the infrastructure that keeps regional Australia connected. We remain committed to playing our part in regional Australia and welcome the Regional Telecommunications Review.

The triennial Regional Telecommunications Review plays an important role in highlighting the changing needs and priorities of regional Australia. The Committee through this latest review has identified some key opportunities where innovation and investment could be prioritised to improve the coverage, quality and resiliency of the telecommunications services available in regional Australia. We agree with these priorities and believe that realising these opportunities should be informed by four factors:

- 1. The economic context of regional Australia.
- 2. The policy and regulatory settings that apply to the provision of services in regional Australia.
- 3. The Government's aspirations and priorities for regionally-based primary industries.
- 4. The changing needs and expectations of regional consumers.

The third and fourth factors outlined above are factors that will require Government policy decisions and we will be guided by those policy decisions. Our submission takes into account our understanding of these points and focusses on:

- the key concerns raised with the Committee as we understand them;
- how the current social and economic context as well as the policy and regulatory settings impact innovation and investment decisions;
- the investments Telstra has made and has committed to make in the future and our support provided to regional communities;
- our recommendations for consideration by the Committee as to how the industry (including Telstra), Governments and the community can work together to improve services offered in regional Australia and address the concerns raised with the Committee. There are many who benefit from enhanced regional telecommunications, so policies and initiatives that recognise this will accelerate investment in regional telecommunications; and
- our answers to the specific questions asked in the Issues Paper.

We are available to discuss any aspect of this response further with the Committee.

Key concerns raised with the Committee

Consistent with our commitment to regional Australia, we have been at every hearing held by the Committee to listen to and help address concerns raised by our customers and regional communities.

Based on the feedback we have heard from customers and stakeholders, the five priority areas as we understand them are:

 Technology upgrades over time (3G/4G transition): as technology develops over time, legacy technology needs to be necessarily retired in order to make way for investment in new technology. For example, Telstra has announced that it will close its 3G network by June 2024 and migrate all customers to the 4G network. Some customers have raised concerns about whether the transition from 3G to 4G will reduce their coverage. Telstra has committed to ensuring that it will expand the 4G network to provide at least the same coverage as its 3G network prior to closing its 3G network;



- 2. **Mobile coverage and congestion:** concerns about lack of coverage and perceived or real diminishing coverage due to congestion as data volumes and demand grow;
- 3. **Mobile resilience:** concerns about outages, including during natural disasters and more generally;
- 4. **Fixed line resilience and service performance for basic telephony:** concerns with the performance of fixed voice services and the process for getting services fixed in the event of a fault; and
- 5. **Digital inclusion, literacy and awareness:** how to build both digital ability and awareness of different technology solutions.

Regional Australia context

Australia's demographics, geography and topology present challenges in providing telecommunications services in large parts of regional Australia. This means that it will not always be possible from an economic perspective to provide the same level of coverage, redundancy and quality throughout Australia, and basic voice and broadband services will only be provided with some kind of Government support.

In addition, congestion is a function of data demand and we are seeing data volumes and demand grow dramatically for a number of reasons, including:

- digital adoption is increasing, customers are increasing their use of new data intensive services such as streaming services, and businesses are adopting different ways of operating which increases their demand for data;
- demographics are changing and we are seeing more people move into regional areas;
- the COVID-19 pandemic is increasing the number of people who are working and studying from home and increasing their demand for data for entertainment; and
- the pandemic is increasing the level of domestic tourism in regional areas which, in turn, increases congestion in those areas.

These factors are leading to substantial increases in the demand for, and use of, data. The only way to meet this demand is to increase capacity and this creates a challenge for network operators as increasing capacity requires significant capital investment and we are currently seeing real pressure to increase this capacity, but do so without increasing the cost to consumers.

The economics of providing fixed services are fundamentally different to providing mobile services.

In fixed, nbn co is required under its Universal Service Guarantee (**USG**) to connect all premises in Australia with high-speed fixed broadband, including premises in regional Australia. nbn co provides these services via different types of fixed technologies in built up areas and via fixed wireless and satellite outside of these areas.

Outside nbn co's fixed line footprint, Telstra provides a fixed voice service through its Universal Service Obligation (**USO**) and meets the specific Customer Service Guarantee (**CSG**) obligations. Unlike the nbn co obligations, Telstra is required to provide these services via specific technology (i.e. its copper network wherever that is available). The challenge with the copper network is that is an ageing technology and it will inevitably be prone to more and more failings over time.

While it is not economic to provide mobile coverage everywhere within Australia, it is economic in many areas and this has seen the development of a competitive and high performing mobile market evidenced by Australia being ranked first in the global Mobile Connectivity Index,¹ which assesses networks based on performance, affordability and availability.

¹ https://www.mobileconnectivityindex.com/



There are certain parts of Australia, however, where the economics for mobile coverage don't support investment without some form of Government support. This is where the Government's co investment programs such as the Mobile Black Spot Program (**MBSP**) have been critical and have supported commercial operators to successfully deliver mobile coverage.

The reality is that even with Government support it is never going to be feasible to provide mobile coverage everywhere in Australia. There will remain large parts of the country that are difficult to reach with existing terrestrial wireless/mobile services. However, technologies are emerging which have the potential to greatly improve the delivery and economics of connectivity in these more remote parts of Australia. One of the emerging satellite technologies that will help to support regional and remote connectivity is Low Earth Orbit (**LEO**) satellites. While there are challenges to overcome, and while satellite will never be a replacement for mobile, this technology may ultimately provide greater capacity and more responsive communications (with lower latency) than what is possible from current satellite options.

Mobile technology depends on radio waves and these are impacted negatively by physical obstructions such as walls, buildings as well as the surrounding topography and vegetation. As a result, it is unrealistic to expect that consumers will be able to get the same level of coverage everywhere within every building in Australia or that the coverage will not change over time as the topography or vegetation changes. This is why the primary service for use indoors is a fixed service. However, the good news is that there are technologies such as Wi-Fi calling which use a mobile phone over the home fixed broadband network to send and review messages and calls in the event that the radio signal is compromised.

Mandated roaming has often been raised as a potential solution to improve mobile services in regional Australia. It is important to understand how mandated roaming works to appreciate the implications it would have on investment in regional Australia because, on the face of it, it can seem appealing. Mandated roaming obliges mobile network operators to allow customers of their competitors to use their network, giving the competitors' customers access to the other operators' coverage, network performance and capacity. Where an operator, say Operator A, has been investing in coverage and network performance as a competitive differentiating factor, clearly when they are then required to make this available to their competitors the incentive to further invest is lost for Operator A. Operator B has no incentive to invest either because there is no need as its customers can just use Operator A's network in the areas where it has no coverage.

The situation is further exacerbated because the capacity that Operator A has invested in for its customers is now being used by its competitor's customers leading to congestion on Operator A's network and a deteriorating performance for all customers. Operator A has no incentive to invest in more capacity to only have it used up by its competitors' customers.

So what may sound like a straight forward solution to improve experience and options for regional customers has exactly the opposite effect. The inevitable outcome of this dynamic is a gradual and systematic decline in network experience with no incentive for anyone to invest to offset it. Ultimately the only solution is for Government to step in and take on the investment responsibility, which would essentially mean the creation of a second nbn, this time for mobiles. In a market that today has the leading mobile networks in the world, this would be a disaster for all mobile customers in Australia with regional customers being the worst affected.

It is true that there are models around the world where versions of mobile roaming are in operation and do work, however the market dynamics, including the position of the various competitors in them, are very different.

Telstra's investment in Regional Australia

Telstra's purpose is to build a connected future so that everyone can thrive. Delivering great coverage and high quality and resilient services for our customers in regional Australia is an absolute priority for Telstra. It is reflected in our investment in regional Australia and in our commitments going forward, our organisational structure, operating model, governance frameworks, and our strategy.



Financial investments

Over the last five years to June 2021 Telstra invested \$8 billion on its mobile networks nationally with \$3 billion of that in regional Australia, and over the same time period we invested over \$5 billion on our fixed networks with \$1.3 billion of that in regional Australia. These networks serve customers across Australia, and in many locations where we are the only non-Government provider to have invested.

Participation in co investments

Telstra has been the largest industry participant in the MBSP. Once all five rounds of the MBSP are completed, Telstra will have invested approximately \$300 million and built around 930 new sites to improve coverage for regional areas around the country – more than two thirds of the total sites co-funded by Government under the MBSP since 2015.

Telstra has also participated significantly in the Commonwealth Government's Regional Connectivity Program (**RCP**). In the two tranches of Round 1 of RCP, Telstra was the only major mobile provider to win projects and commit funding to improve services. We will deliver 72 projects under Round 1 of RCP, and we will contribute \$24 million of our own funds to these projects. An advantage that RCP provides is the greater flexibility to propose solutions to enhance regional networks compared with previous programs.

Other investments

In addition to our financial investments, we have established frameworks to ensure we understand and can address issues in regional communities, with those communities. These have included:

- The establishment of Regional Advisory Councils with third parties represented to ensure that we
 continue to understand and address concerns raised by regional Australian communities. These
 provide us with direct feedback on community concerns and expectations and ways in which they
 can be addressed.
- Appointing Regional General Managers and dedicated Regional Network Advisers who live and work in communities and help us understand and address community concerns and expectations.
- Committing to answering all voice calls in Australia by 30 June 2022 and bringing our Telstra retail stores back to direct Telstra ownership. We currently haves 138 stores in regional locations across Australia providing sales and service support to those communities.
- Partnering and supporting state and national stakeholder groups that are focussed on delivering better outcomes for regionally based industries or communities. These partnerships support us in understanding the needs of these different groups and how we can collectively deliver improved services to their members. This includes organisations such as the National Farmers Federation, state farming organisations, the Isolated Children's Parents' Association (ICPA), the Country Women's Association (CWA), the Regional Australia Institute (RAI), state Local Government Associations and many regionally based organisations.
- Partnering with a number of community organisations to improve digital literacy, particularly for vulnerable customers. This includes the elderly via our Tech Savvy Seniors and Social Seniors programs, individuals impacted by tech facilitated abuse via our Telstra Safe Connections program, and indigenous communities through our Deadly Digital Communities and inDigiMOB programs. We are also partnering with the Centre for Appropriate Technology to deliver a new digital literacy program in the Northern Territory.
- Providing the most extensive offering for low income, vulnerable and disadvantaged customers
 delivering more than \$3 billion in value since 2002. Assisting people on low incomes or facing
 financial hardship to maintain access to telecommunications services via our Access for Everyone
 program these programs focus specifically on ensuring that digitally excluded customers such
 as the elderly, indigenous Australians and children in low income families remain connected as
 well as those experiencing homelessness, family violence or those who have been impacted by
 natural disasters.
- Recognising that our customers have experienced particular frustration with being able to contact us and resolve issues over the last year during the COVID-19 pandemic, we have invested in our domestic and international contact centre operations to improve our customer experience. At the



peak of COVID-19 impacts in 2020, we prioritised taking calls from vulnerable customers and customers with a service fault, and we directed other customers to messaging for some enquiries. This workaround was progressively removed and, since June 2021, all customers have been able to contact Telstra in their channel of choice. We have now restarted our dedicated routing for service calls to our South Australian based team for our regional customers. We also continue to prioritise handling of complex and high risk customer groups, many of whom are in regional Australia. This includes our First Nations Connect team, our SAFE team supporting victims of family and domestic violence and our Specialised Assistance and Priority Assistance teams.

We are committed to continuing this investment in regional Australia and have made the following commitments specifically focussed on regional Australia:

- \$150 million in FY22 to improve regional network customer experience, including addressing areas affected by congestion through prioritising the upgrade of over 180 3G only sites, augmenting capacity at selected 4G sites with high traffic, and further 4G site optimisations to better balance 3G/4G traffic and address localised customer demand.
- \$75 million from the partial sale of our towers business will be directed toward enhancing connectivity in regional Australia, which will be guided by the recommendations of the RTIRC 2021 Review.
- \$200 million co-investment funds over four years to further extend regional coverage through partnering with Commonwealth, State and Local Governments and local communities. This investment will support our commitments made as part of our recently announced T25 strategy which includes expanding 4G/5G coverage in regional Australia by at least 100,000 km².
- improving services by expanding our 4G network and to provide coverage to those who can currently only access the 3G network.
- expanding our 5G network to cover 95 per cent of the population and 80 per cent of all mobile network traffic being on 5G by FY25.
- trialling ways to deliver better coverage, redundancy and quality, including by 4G fixed wireless technology and introducing a satellite service in FY23.
- continuing our battery life cycle replacement program that prioritises locations of increased natural disaster risk - since November 2020 we have replaced batteries in over 280 sites and will target 600-700 sites this financial year.
- committing \$5 million to targeted investment program to address fixed line issues in areas of challenging performance due to ageing infrastructure in order to improve network quality and customer experience.
- supporting digital inclusion by continuing to support our digital inclusion programs, including:
 - supporting at least 1 million customers in vulnerable circumstances to stay connected each year to FY25; and
 - increasing digitally active customers by 2 million including building the digital skills for more than half a million Australians

Recommendations

Taking into account the social and economic reality of providing telecommunications services in regional Australia and the investments and commitment currently made by Telstra, we believe that there are eight additional matters that the Committee could consider in order to improve the coverage, quality and resilience of telecommunications services in regional Australia.

 Mobile congestion - that the telecommunications industry, through Communications Alliance and the Australian Mobile Telecommunications Association (AMTA), develop an education campaign on mobile congestion – what it is, what impact it has and information around how the sector manages customer concerns on impacts on performance due to congestion in the mobile network.



2. Improving understanding of connectivity solutions

- a. Fault identification and rectification that all fixed network operators in regional Australia provide transparent reporting on fault identification and rectification to help ensure customers know what they are getting at all times. Greater transparency of the capabilities and performance of fixed network services would benefit customers as they make choices about the best mix of services and service providers to suit their needs. For example, Telstra publishes monthly data on our fault rectification performance broken down by geographical areas (<u>https://www.telstra.com.au/consumer-advice/customerservice/network-reliability</u>), but to our knowledge there is no comparable regional-specific data provided by nbn co or other network service providers.
- b. **Role of regional LGAs** that Government be encouraged to direct funds towards regional LGAs to assist in both raising the levels of understanding of connectivity solutions and technologies most appropriate for their specific communities.

3. Digital inclusion

- a. That Commonwealth and State/Territory Governments, in conjunction with the industry, be encouraged to scale and enhance existing, localised digital inclusion programs that improve digital capability, especially for vulnerable Australians.
- b. That nbn co develop and offer to Retail Service Providers (**RSPs**) an affordable nbn consumer plan to benefit all households receiving government income benefits.
- 4. Mobile resilience that the Commonwealth Government:
 - a. continues to support the Commonwealth Government's Strengthening Telecommunications Against Natural Disasters (**STAND**) program; and
 - b. commits to implementing and funding Cell Broadcast emergency notification capability to enhance regional resilience in natural disasters.
- 5. USO reform that the USO for basic telephony services be reformed to focus on outcomes to be delivered for customers rather than the technology used to deliver those outcomes. The USO could be reformed to ensure that the entity responsible for the USO be required to provide at least the same level of coverage, resilience and quality using technology that best delivers and enhances these outcomes over time with the nbn broadband services used to provide voice back up services for these communities in the event that the primary service were to fail.
- Co-investment programs building on the strengths of programs such as the MBSP and RCP, that future co-investment programs provide greater flexibility for telecommunication providers to deliver improved connectivity to regional communities given the economic challenges of delivering regional connectivity – these include the enhancements recommended in section 7.4 of the submission.
- 7. Greater coordination that Commonwealth Government funding and support be directed toward greater coordination between Governments at all levels, local communities and telecommunications providers to enable the development of plans for enhancing connectivity for local communities based on the specific geographic and social needs of those communities, including to support community resilience during natural disasters. For example, local planning initiatives which would improve connectivity but are prevented from progressing because local planning permission cannot be obtained.
- Infrastructure sharing while Telstra does not support mandated roaming because of the impact on innovation and investment incentives, policies and programs which enhance the opportunity for passive telecommunications infrastructure sharing should be encouraged.



1. Introduction

Telstra welcomes the opportunity to provide a submission to the 2021 Regional Telecommunications Review.

We have a long history of investing in and supporting regional Australia. We take this responsibility seriously and have an absolute commitment to delivering high quality services to our customers in regional Australia. This includes our investments to improve telecommunications coverage, capacity and performance in regional Australia, as well as service and fault restorations.

This does not come without its challenges, but we have been doing it for 150 years and understand those challenges better than anybody. Our commitment to regional Australia is unwavering.

We are always focused on how we can improve our service and our customers' experience. It is also important to note that often we are the only telecommunications company criticised because we are the only telecommunications company offering services to these communities.

In the five years to the end of June 2021, we had invested \$8 billion in our mobile network nationally with \$3 billion of that in regional areas so more Australians can participate in the digital economy.

We have the largest mobile network in Australia, covering around 33 per cent of Australia's land mass and reaching 99.5 per cent of the population, with the overwhelming majority of the capital invested in this network having been made since privatisation. This demonstrates our commitment to investing in new technologies for regional Australia, which has been a commercial decision made by Telstra.

We understand the challenges of delivering coverage in regional Australia, and we continue to invest where others do not. In the two tranches of Round 1 of the Commonwealth Government's Regional Connectivity Program (**RCP**), we were the only major mobile provider to win projects and commit funding to improve services. We will deliver 72 projects under Round 1 of RCP, and we will contribute \$24 million of our own funds to these projects.

In the Commonwealth Government's Mobile Black Spot Program (**MBSP**), after this latest supplement to Round 5, and once all five rounds of the MBSP are completed, we will have invested up to \$300 million and built around 930 new sites to improve coverage for regional areas around the country – more than two thirds of the total 1296 sites co-funded by Government under the program since 2015.

We don't do any of this because we have to, or to meet any regulatory obligation. We invest commercially for our customers to ensure they can receive the benefits of Australia's largest mobile network.

Our commitment to regional investment will continue. We have made further significant regional investment announcements in 2021, including:

- In May we announced our intention to spend \$150 million over the next 12 months to enhance our networks in regional, rural and remote Australia.
- In May we also announced we are contributing \$200 million of co-investment funds over four years to further extend regional coverage, starting from FY22. This will stimulate co-investment with Government, local councils and businesses in areas that would otherwise be difficult to justify on economic grounds.
- On 30 June we announced \$75 million from the partial sale of our towers business would be directed toward enhancing connectivity in regional Australia, which would be guided by the recommendations from this review.

In addition, over the five-year period that ended in June 2021, we had invested around \$1.3 billion in our fixed network in regional and remote areas of Australia. This investment has primarily been to maintain, upgrade and expand the capacity of our fixed networks covering the Core, Transport, and Aggregation networks, Exchange site power and cooling, and in the provision of Wideband services to support high speed data access products.



The reliance on mains power is of critical importance for many of our sites and can often be a major cause of outages to our network. As a result, we continue to invest in battery back-up as part of our overall power resilience strategy. For example, we have replaced batteries at over 2,100 network facilities nationally over the last two years. This program is continuing through FY22.

1.1. Telstra's new corporate strategy – T25

Over the past three years, we've been on a journey of transformation that we called T22. On 16 September we announced our T25 strategy to help us accelerate growth, enhance customer experiences and capitalise on permanent shifts in how people work and live.²

T25 will be made up of four core strategic pillars to deliver:

- An exceptional customer experience you can count on.
- Leading network and technology solutions that deliver your future.
- Sustained growth and value for shareholders.
- The place you want to work.

The core pillars are as much aimed at regional Australia as they are metro Australia. However, the T25 strategy includes several key announcements for regional customers, including:

- Adding at least another 100,000 square kilometres of mobile coverage to our national footprint to support regional and remote customers.
- Continuing our investment in our 5G network leadership with 95 per cent population coverage and 80 per cent of all mobile network traffic being on 5G by FY25.
- Supporting digital inclusion for regional and vulnerable customers by continuing to make significant investments in regional Australia, launching a satellite service in FY23, helping keep one million customers in vulnerable circumstances connected, and building digital skills for 500,000 Australians.

Our announcements through T25 demonstrate our continued commitment to delivering the best technology solutions for regional and remote communities.

1.2. Future technology to support regional telecommunications

In the Terms of Reference provided to the Committee it is encouraging to see a focus on emerging technologies that could significantly improve the delivery of services to regional and remote Australia.

As the current Universal Service Obligation (**USO**) provider for the basic telephony service, we have been encouraging reform of the USO arrangements for many years. Under the existing contract with the Commonwealth we are required to deliver standard telephony services using the ageing copper fixed line network and associated infrastructure, which is holding back our ability to invest in new technologies for fixed voice services.

Our submission covers this technology horizon in more detail in section 6.

To address the connectivity needs of regional and remote communities requires the involvement of multiple parties. As the major telecommunications provider in Australia, and one of the few making significant investments in regional Australia, we have a part to play in delivering these services.

² Our T25 strategy was announced on 16 September 2021. Refer to the following link:

https://exchange.telstra.com.au/introducing-t25-our-plan-for-growth-and-enhanced-customer-experiences/



However, the responsibility is not solely that of Telstra. Commonwealth and State / Territory Governments, regulators and the industry all have a part to play. Getting the policy settings right will be part of the solution, as will the direction of regional investment programs from Governments. This is outlined in more detail in section 7 of our submission.

Our commitment to regional Australia is also demonstrated in our engagement with this review. In order to listen and respond to regional communities we have attended all the consultation meetings held by RTIRC in 2021 and remain committed to working with the Committee to help them form their recommendations.

1.3. Understanding the roles in delivering telecommunication services to regional Australia

It is important to highlight that due to the large geographic expanse, low population density and challenging terrain, providing telecommunications connectivity in large parts of regional Australia is commercially challenging.

We have a USO to ensure standard telephone services (**STS**) and payphones are reasonably accessible to all people in Australia on an equitable basis, wherever they work or live. This is an obligation on Telstra both under legislation and under a contract with the Commonwealth Government. We fulfil this obligation by providing customers access to a voice telephony service, and by ensuring connections and faults associated with this service are undertaken and repaired within a reasonable time.³

Despite this, there's still a gap between the USO requirements for fixed voice services and community expectations. That's why we're asking for a change to the USO so we can offer customers appropriate technology solutions to meet their needs – solutions that don't just rely on traditional PSTN phone services over copper, which has increasingly become an outdated technology.

We are also just one contributor to improving connectivity in regional Australia. Rolling out, maintaining and upgrading telecommunications technology in regional and rural Australia, particularly in remote areas, is expensive and far from simple.

We are responsible for delivering the USO. However, we don't believe it's our role or our shareholders' role to provide a level of service on the outdated copper network technology beyond the scope of the current USO. We believe there is a role for Government in helping to meet the expectations of regional communities, which have increased significantly since the USO was first put in place.

In addition, through the policy of successive governments, the last decade has seen nbn co given accountability to connect all Australians with high-speed broadband, no matter where they live or work. This policy was designed to ensure ubiquitous availability of high-speed broadband and increase competition in the market.

nbn co uses fibre-based technologies to meet its objective in built up areas, and fixed wireless and satellite in regional Australia. Importantly, the nbn rollout has been declared complete. This is an important point because while Telstra and other providers may choose to offer non-nbn based broadband solutions to customers in a competitive market, it is not our accountability to do so should a broadband user not be satisfied with their nbn performance.

Provision of mobile connectivity – both voice and data – is a different matter. In a commercial market, like Optus and TPG (Vodafone), we invest where it is commercially viable to do so. This has been the case since the Commonwealth Government finalised the sale of Telstra to Australian shareholders in 2006. Since Telstra was privatised the size and scope of our investment in mobile coverage and technology has been unequalled. This investment has played a critical part in Australia being ranked first

³ For example, within timeframes set out in the *Telecommunications* (Customer Service Guarantee) Standard 2011.



in the global Mobile Connectivity Index which assesses networks based on performance, affordability and availability.

The scale of the Australian landmass and concentration of our population density means that economically it is not feasible to expect all of Australia will receive mobile coverage. The cost of investing, delivering and maintaining services in large parts of Australia is not commercially viable. We will continue to work with customers, communities and Government to deliver the most extensive mobile network to regional Australia, but there is a limitation to the extent that coverage can be delivered. That is where we see future technologies, as outlined in section 6, will play a role.

2. Acknowledging community concerns raised through RTIRC 2021 consultations

Our commitment to regional and remote Australia is reflected in our support of the community meetings undertaken by the Committee. Telstra representatives attended each of the RTIRC community consultation forums held through July to September.

This was a similar approach taken with the previous review in 2018. In response to the recommendations of the 2018 review we undertook a program of work to repair and replace cable joints, migrate customers from ageing high capacity radio concentrator (**HCRC**) networks onto NextG Wireless Local Loop (**NGWL**), replace around 200 batteries in exchange and roadside cabinets, and we increased our stock of pair gain units. These types of measures to support fixed line resiliency are still relevant in 2021, which reflects the challenge we have in delivering regional connectivity on ageing networks.

Based on the feedback we have heard from customers and stakeholders directly and through the Committee meetings, we see five main areas of concern regarding the adequacy of telecommunications services in regional, rural, and remote parts of Australia:

- 1. **Technology upgrades over time (3G/4G transition),** which includes some concerns about coverage equivalency of the 4G network and cost to change over technology as we move toward the 3G closure in June 2024.
- 2. Mobile coverage and congestion:
 - a. General concerns about lack of coverage (such as along major highways) and perceived diminishing coverage.
 - b. Awarding competitor towers through the MBSP in areas predominantly covered by Telstra. This is where a customer lives in an isolated small area of coverage from one mobile provider without contiguous coverage, creating an 'island' of mobile coverage. Looking at additional co-location options is a path to addressing this concern.
 - c. Network congestion the rapid regionalisation of Australia and the increased reliance on technology for school, health and work due to COVID-19 has placed increased demand on the network. In addition, some regional areas also experience seasonal fluctuations in population (for example, during peak tourism seasons), which can also cause congestion.
- 3. Mobile resilience the impact of mains power loss as a major contributor to telecommunications service outages, particularly during natural disasters such as cyclones, floods and bushfires. However, outages in mobile networks are felt strongly as our society increasingly relies on connectivity for accessing services or payment systems.
- 4. Fixed line resilience and service performance for basic telephony the importance of fixed services and the restoration of services on ageing technology. Alternative technologies are a solution, acknowledging there is still a lack of confidence in relation to satellite services, the main areas of concern being quality of service due to weather impacts, latency and speed, the amount of data available on satellite service plans and the high price of plans.
- 5. **Digital inclusion, literacy and awareness** digital ability and awareness of different technology solutions in regional areas and how to deliver this successfully is a consistent theme. We also



note that Public Wi-Fi has been raised as a possible solution to access and affordability for low socio-economic areas.

We also acknowledge some customers have expressed concern around customer service, and this has been particularly amplified due to the increased reliance on telecommunications during the COVID-19 pandemic. These concerns primarily focused on three key issues:

- Not being able to contact Telstra by phone and being forced to use a digital service.
- Regional customer service issues are often more complex and specific to an area, sometimes making them difficult to resolve.
- Telstra and nbn co not being seen to work together in a co-ordinated way to resolve issues.

Communities have also expressed a desire for better planning, prioritisation and funding of connectivity solutions. This includes a call for more assistance being provided to communities to build resiliency in times of natural disaster, including the use of various connectivity options given no telecommunications infrastructure can be fully protected against natural disasters.

We note that during the RTIRC consultation phase, the Australian Broadband Advisory Council's (**ABAC**) Agri-Tech Expert Working Group provided a report, which included a recommendation about planning for local needs. In their report the ABAC Working Group recommended a whole-of-government approach towards long-term planning for connectivity whereby greater co-ordination is placed on all levels of Government and aligned with the priorities of regional areas.⁴

We acknowledge and understand the concerns raised by those who attended the consultation meetings held by the Committee. They are familiar to us through our own engagement with regional and remote customers and stakeholder groups. We have a number of initiatives underway that are aimed at addressing and responding to these issues. Section 3 provides details and responses to these five key themes, plus also responding to the specific concerns raised regarding customer service during the pandemic.

As outlined in section 1, to reflect our ongoing commitment to regional Australia, we have already committed \$75 million from the partial sale of our towers business towards enhancing connectivity in regional Australia, with this investment to be guided by the recommendations from this review. This is in addition to our \$200 million of co-investment funding over four years and the \$150 million in FY22 toward regional networks announced in May.

3. Responding to regional connectivity themes

Access to connectivity and modern technologies is critical for digital inclusion and participation in the digital economy. We also recognise this access can be more challenging in regional areas, which is why we have invested more than \$3 billion in our regional mobile network and \$1.3 billion in our regional fixed network over the five years to June 2021. These headline investment figures only reflect capital expenditure – they do not include operational expenses in areas such as maintenance and field technicians, customer complaint handling and resolution in general, or site rental and power costs — collectively our expenditure in these areas is substantial.

We note the \$3 billion mobile investment in regional areas over the five years to June 2021 has been over indexed towards regional. This means we spend proportionally more in regional areas (and especially rural and remote areas) than in metro areas on a population basis. For example, over this same five-year period we invested 7 per cent of our capital on the remotest 2 per cent of the population. This investment has funded extension of our rural and remote coverage in hundreds of new areas nationwide, delivered over 200 regional small cells for small town and community coverage, continued

⁴ ABAC Agri-tech Expert Working Group report. Released 10 September 2021. Source: https://www.communications.gov.au/documents/agri-tech-expert-working-group-june-2021



the expansion of our 4G footprint to deliver equivalent coverage to 3G ahead of the 3G closure in June 2024, and rolled out 5G in more than 200 regional cities and towns – far more than any other carrier.

Further, coverage extension devices can extend the range of existing mobile towers. We estimate that customers would benefit from an additional 10,000 kilometres of 4G coverage along some 60,000 kilometres of national highways and roads, with the use of extension devices.

3.1. Technology upgrades over time (3G/4G transition)

In October 2019, we announced our intention to close our 3G network in June 2024.5

Our 3G closure announcement was significant for regional areas in a number of ways and we're supporting customers with the transition from 3G to 4G.⁶ There are many reasons why we are closing our 3G network.

No 3G coverage will be removed or reduced before the June 2024 closure date.

While 3G has been important in delivering our current mobile coverage to 99.5 per cent of the population and 2.5 million km² of Australia, our rollout of the more advanced 4G technology is rapidly approaching this coverage, reaching 99.4 per cent of the population today and an area of over 2 million km² of the country. We're continuing to grow our 4G coverage and will be providing equivalent 4G coverage before the closure of our 3G network in June 2024.

4G is a more advanced technology than 3G and will support better end user experiences. Additionally, as 3G traffic declines we can progressively re-farm 850 MHz spectrum for 5G services without any reduction to 3G coverage, as is already happening in selected areas today. Ultimately, once 3G is closed in June 2024 we will be able to use our full holdings of the 850 MHz band for the expansion of 5G services in regional Australia.

The 3G to 4G transition will enable better experiences for regional customers, opening up greater opportunities for digital inclusion and participation in the digital economy.

From a speed perspective, while people using 3G handsets within our 3G coverage areas experience typical download speeds of 550kbps – 20Mbps. Telstra customers with the latest capable 4G devices typically get much faster download speeds in the 5Mbps – 500Mbps range.

From a spectrum and capacity perspective, our 4G service in regional areas will utilise our 700 MHz spectrum, where bandwidths are greater compared to our 850 MHz holdings. This provides greater capacity.

While we take network capacity very seriously, and our mobile network is designed and managed under strict world-standard guidelines to minimise congestion, the capacity of 3G-only sites is necessarily limited and, in some instances, where the number of users greatly exceeds the normal traffic at that location, congestion can occur. When a site is suffering significant congestion 'cell breathing' can occur, whereby the edge of the cell coverage effectively retracts inward to manage the demands being placed on it.⁷ Where we have identified sustained congestion of certain 3G-only sites we have fast tracked those locations for 4G upgrades. The additional capacity 4G brings is critical for supporting customer data demand growth of ~40 per cent each year. More capacity typically means less congestion

⁵ See https://exchange.telstra.com.au/1-2-3-4-and-5-the-continuing-evolution-of-our-mobile-network/

⁶ 3G closure will be a national closure.

⁷ While Cell Breathing is possible with 3G, 4G and 5G technologies its impacts are less significant on 4G and even less again on 5G due to advances in technology that are included in the standards associated with these technologies. For example, Antenna Beam forming technology on 5G reduces the occurrence of breathing, but also overcomes the effects of breathing by targeting the RF signal to the location of the handset.



(i.e. 4G capable traffic moves to the 4G layer, de-loading the 3G layer in the process and alleviating any congestion and associated cell breathing that may have occurred) and higher and more consistent speeds. See section 3.2 for more detail about mobile congestion concerns.

From a coverage perspective, 700 MHz spectrum used for 4G is 'low band' just like the 850 MHz used for 3G, with similar — indeed slightly better — propagation (relating to how well the frequencies travel over distance and through walls etc). Further, with our radio equipment vendor we also developed and deployed software in 2020 that increases the maximum distance range of 4G technology up to 200 kilometres. This will support our program to ensure we match 3G in all areas.⁸ In combination, these considerations mean we are able to make our 4G coverage equivalent to 3G well in advance of the 3G closure in June 2024.

Delivering 4G coverage equivalence requires upgrades to 3G-only sites and a small number of greenfield 4G sites to provide additional 4G coverage where unique site configuration or limitations means the 4G coverage is currently less than 3G. We have already upgraded more than 8,200 3G sites to include 4G technology. All remaining required site upgrade activity to establish 4G coverage equivalence will be completed before 3G closure proceeds at end June 2024. As we progress with this upgrade program, we will be analysing network data at newly upgraded sites to confirm 3G-4G coverage equivalence and will also undertake sample field testing of upgraded sites to cross-check our internal analysis and ensure alignment to our 4G upgrade coverage prediction.

It is important to recognise that 3G is not our first network closure. In fact, we've previously closed three mobile networks to introduce new technologies and meet the growing demand of customers.⁹ Our previous experiences in closing networks have provided us with learnings on how to support customers through network transitions and how to ensure our customers retain coverage, which we are drawing upon.

For the vast majority of our customers, the closure of our 3G network won't require any action on their part to retain coverage and service. Most modern phones are already 4G capable, meaning they'll continue to work on the upgraded network as before.

For customers using 3G-only devices, they will need to take action. Through network data we can identify and track the number of 3G-only handsets on our network. These devices are typically already older than six years, and we can see a high level of natural attrition as customers upgrade to devices with 4G capabilities.¹⁰ Despite this trend we are proactively engaging with customers that have 3G-only devices from Q2 FY22, so they are aware of our 3G closure plans and the options which are available to them. The box below outlines some of the educational and 3G closure awareness activities we have recently initiated in regional areas, and these will continue in various forms until the time of 3G closure.

⁸ <u>https://exchange.telstra.com.au/making-our-4g-coverage-go-even-further/</u>

⁹ The AMPS network was closed in Metro areas in 1999 and Regional areas in late 2000, CDMA was closed in April 2008 and 2G closed in December 2016.

¹⁰ 3G only devices are distributed across Metro and Regional areas, broadly consistent with population shares — that is, there is no strong concentration of 3G only devices in Regional areas or 3G only areas. This is not a surprising observation as our 4G footprint is already very expansive (covering 99.4 per cent of the population in June 2021), customers move about and generally devices are upgraded every three to four years on average.



Service messaging

In September 2021 we began an SMS campaign to contact customers impacted by our 3G closure. This will extend to ~1.1 million customers with 3G-only or Non-Volte capable devices.

These messages remind customers of our upcoming closure and provide a link where they can access more information.

Device upgrade/setting update

In August 2021 we began our device upgrade / software setting update initiative, where we will be using targeted messaging (SMS as shown, local newspapers, radio and telephone) to encourage people with 3G-only devices to visit us in-store to upgrade their hardware or update their software settings.

The initial focus is on the regional centres of Townsville (QLD), Toowoomba (QLD) and Saddleworth (SA).

Today 10:11

From June 2024 your 3G mobile phone won't operate on the Telstra Mobile Network. You won't be able to call, SMS or use data. Check if your mobile is affected <u>https://</u> www.telstra.com.au/support/ mobiles-devices/3g-closure

Come and see our team to ask how this affects you Dates: <u>26th-27th August</u> Times: <u>10am-4pm</u> Location: Bee & Hill Park, Belvidere Rd, Saddleworth

As part of our community engagement activity, we will be advising local communities of when 4G upgrades are coming to their area. In FY22 this activity will be focused on locations with high traffic demand on the 3G network, and we will cover the remaining 3G-only areas in FY23 and FY24.

Figure 1 summarises our work to ensure coverage migration from 3G to 4G.

Hardware & Spectrum	Software
Add 4G on 700MHz to all existing Ericsson 3G 850MHz sites	 Deploying software to increase the range of 4G at selected sites to up to 200km
Greater bandwidth on 700 MHz compared to 850 MHz	Additional tweaks to improve performance.
Add selected greenfield 4G sites to supplement upgrade program where needed.	
Engineering Checks	Vendor Partnership
 Engineering Checks Analysis of network data used to confirm 3G-4G equivalence Sample field testing of upgraded sites used to cross-check network data confirmations and check alignment to predictions. 	Vendor Partnership • Ongoing program of lab tests with our key vendor Ericsson, focussed on coverage equivalence and network performance (across both hardware and software).

Figure 1. Framework for ensuring coverage equivalence in migration from 3G to 4G



A range of affordable 4G/5G handsets starting at \$49 are available. We continue to monitor and as part of supporting customers with the transition we are offering discounts off selected handsets and Telstra Points to be redeemed on customers' accounts.

In respect to customers who use our Next G Wireless Loop (**NGWL**) service, which is partially dependent on 3G, we are developing and trialling a 4G fixed wireless (**4GFW**) voice solution as a 'go to' product and we expect to start implementing this for customers from 2023.

NGWL services

We currently have several thousand NGWL services. As these services utilise 3G technology, we will be migrating them to a 4G solution before June 2024.

We anticipate that most of these customers will migrate to a 4G Fixed Wireless (FW) solution, coupled with the third generation of our Smart Modem, which will have an antennae port allowing for connections to an external aerial. We will be working to ensure the voice service will meet current USO requirements.

We expect migration of NGWL customers will commence in 2023, and where customers already have an external antennae we expect in many cases this will be re-usable with the 4G FW solution.

With the evolution of mobile technology to new generations, mobile providers must ensure that customer concerns regarding the switch-off of 3G mobile network technology are addressed. More specifically, consistent with the commitments we have made regarding the 3G closure, mobile providers should:

- rollout equivalent 4G coverage to match 3G coverage prior to the switch-off of any 3G mobile network;
- provide transparency of the number of sites that have been upgraded to 4G and upcoming planned upgrades, and undertake targeted community engagement and regular briefings to regional groups to address concerns; and
- run national and local campaigns and create a dedicated online information source for customers about the 3G switch-off.

3.2. Mobile coverage and congestion

We have the largest mobile network in Australia, covering around 33 per cent of Australia's land mass and reaching 99.5 per cent of the population, with the overwhelming majority of capital invested in this network having been made since Telstra's privatisation. This demonstrates our commitment to investing in new technologies for regional Australia, which has been a commercial decision made by us.

As highlighted in section 1.3, the provision of mobile connectivity – both voice and data – operates in a commercial market. Like Optus and TPG (Vodafone), we invest where it is commercially viable to do so. This has been the case since the Government finalised the sale of Telstra to Australian shareholders in 2006. Since Telstra was privatised the size and scope of our investment in mobile coverage and technology has been unequalled.

The scale of the Australian landmass and concentration of our population density means that economically it is not feasible to expect all of Australia will receive mobile coverage. The cost of investing, delivering and maintaining services in large parts of Australia is not commercially viable. We continue to work with customers, communities and Government to deliver the most extensive mobile network to regional Australia, but there is a limitation to the extent that coverage can be delivered. That is where we see future technologies, as outlined in section 6, will play a role.

Co-investment programs such as the MBSP and RCP have been significant for enabling the provision of new mobile coverage to regional and rural areas that are not economic for mobile network operators to invest in.



We have been a strong supporter of these Government co-investment programs, and the largest of these programs is MBSP. Through our participation across 5 rounds (including the supplementary Round 5A), we will have invested up to \$300 million and built more than 930 new sites to improve coverage in regional areas around the country – more than two thirds of the 1296 sites co-funded by Government under this program since its 2015 inception. We have also contributed \$24 million towards RCP, and recently we announced a further \$200 million co-investment fund to generate additional investment to improve regional coverage.

We continue to extend newer mobile technologies to regional and remote areas, as summarised in section 3.1 regarding our closure of the 3G network and our commitment to bringing 5G technology to regional Australia (see section 6.1). Section 7.4 outlines areas of change we think are required to the MBSP.

Mobile congestion

There appears to be some misapprehension that service levels are or have been wound back on the regional network in recent years. This is not the case. What has happened is rapid growth in customer demand and usage of mobile data, which has sometimes run ahead of our ability to add capacity in some areas.

Customer demand and usage on the mobile network has grown considerably over the last three years, and this growth is as much a feature of regional mobile customers usage as it is for more metropolitan customer usage.

Figure 2 shows customer usage in regional Australia (made up of the four ABS remoteness zones of inner and outer regional, remote and very remote), measured in petabytes, grew at the same rate as the nation as a whole – almost threefold in just three years. Further, demand in the remotest areas of Australia (very remote) actually grew more than any other zone.

To view this a different way, imagine for a moment vehicle traffic on the national highway grew three times in three years. There would be no way to expand the highway sufficiently to keep traffic moving at the same rate as before. It's the same for the mobile network.

Upgrades have been ongoing through this period but keeping up with such growth is an incredible challenge and more so in regional and remote areas where logistical complexity and costs to deploy are higher in line with increasing remoteness, making the overall site economics more challenging.



Figure 2. Data growth trends for download traffic volumes since 2018, for regional and remote areas compared with the national trend



Figure 3 below shows traffic volume year on year for download alone (so with upload would be higher again). More than 43 per cent of the total data downloaded on the mobile network is downloaded in regional Australia and the volumes involved are enormous – 760 petabytes downloaded in 2021 in regional Australia is 760 million gigabytes. 1 Gigabyte is around an hour of Netflix streaming, so the result here is equivalent to a download of around 760,000,000 hours of Netflix in regional Australia.



Figure 3. Data growth in petabytes for download traffic since 2018, for regional and remote areas compared with the national trend

Another driver of congestion is the delivery of services through app-based technology. This can place a higher demand on data capacity within the network. We are continuing to invest in new capacity and newer technologies to meet growing demand, but there is also a need for developers to consider the optimal design of apps that does not assume continuous coverage everywhere or endless network capacity in areas that typically have fewer customers present.

The challenge caused by higher capacity demand by app-based technology has been evident in some recent remote special events where the available capacity can struggle to keep up with brief peaks in demand. As an example of how design options can assist, for QR code applications such as those used by state Governments during the current COVID-19 pandemic, these could use QR code caching until a connection becomes available. Designs of apps should take into consideration data capacity.

Recommendation

1. **Mobile congestion** - that the telecommunications industry, through Communications Alliance and the Australian Mobile Telecommunications Association (AMTA), develop an education campaign on mobile congestion – what it is, what impact it has and information around how the sector manages customer concerns on impacts on performance due to congestion in the mobile network.



3.3. Mobile resilience

We maintain internal targets for service restoration on the mobile network where critical incidents occur, and we do better than these targets on a consistent basis.

An often-raised concern in relation to mobile network resilience is power redundancy. It is important to note:

- The role of the battery is to maintain continuity of telecommunications services during short power interruptions only. Where power interruptions are expected to extend beyond the battery reserve limits, this reserve also provides the valuable time needed for staff to attend sites when safe to do so and support the network with a portable back-up power supply (generator). The back-up solutions we implement are tailored to each site, delivering resilience whilst balancing practical constraints in some cases this will be 12 hours, but in other cases a 12-hour reserve may not be needed.
- Most sites are reasonably accessible, so the basic battery reserve is up to 3 hours.
- Installing 12-hour batteries is appropriate in some circumstances, noting this involves extra costs for (a) the batteries; (b) huts or shelters to accommodate the batteries; and (c) opex to run the incremental infrastructure (including site lease costs, which go up with any additional structures installed). Costs can easily reach \$50,000+ per site.
- When reserves are increased, the associated costs start to increase exponentially. With some sites that are reasonably accessible and do not take long to access, for example, extended reserves may not be necessary. Adding more batteries at a given site may require more huts as batteries should ideally be sheltered, and in some cases we won't have permission or suitable space for additional huts.

Section 4 covers telecommunications in disaster situations and is also relevant to network resilience (both fixed and mobile).

EFTPOS devices and their resilience

EFTPOS is now the preferred method of payment for most customers, with the share of cash-based transactions decreasing over time.¹¹ As part of business continuity planning, retailers should take the time to ensure their EFTPOS terminals are configured to use alternative connectivity in the event of a mobile service disruption.

Today there are a wide range of EFTPOS terminals available in the market. These typically utilise mobile networks such as 3G or 4G, with many also having Wi-Fi/ethernet capabilities and/or a dual SIM capability.¹² Some EFTPOS terminals may also be supported by satellite-based products, with the enablement via the connectivity provider as opposed to the terminal itself. We provide a certification service to EFTPOS terminal suppliers, but we do not supply EFTPOS terminals ourselves.

EFTPOS terminals can be impacted by mobile network outages and power outages, with differing scenarios depending on exactly what occurs.

In the case of a mobile network outage, where power otherwise remains available:

- Terminals with wireless and Wi-Fi/ethernet capabilities will be able to toggle between the two connectivity options and should switch automatically to a Wi-Fi/ethernet connection where one is available.
- Terminals with dual SIMs will be able to toggle between different mobile networks, provided they
 have SIM cards from different mobile network operators inserted.

¹¹ This trend was reported on in the RBA's 2019 Consumer Payments Survey, released June 2020. See: https://www.rba.gov.au/publications/bulletin/2020/jun/cash-use-in-australia-results-from-the-2019-consumer-payments-survey.html

¹² EFTPOS terminals have fairly low data rate requirements, and 3G and 4G networks have plenty of bandwidth to support EFTPOS transactions.



- Terminals with electronic fallback options will be able to continue processing transactions within certain payment limits, despite there being no mobile connectivity.
- Terminals supported by Telstra enterprise satellite products will continue to operate.

If there has been a physical impact to the network (e.g. due to a natural disaster), we may be able to deploy temporary infrastructure such as a Cell on Wheels (**CoW**) or a Satellite Cell on Wheels (SATCOW) to restore connectivity to the Telstra mobile network, which will allow EFTPOS services to function normally, while our field crews assess and repair damaged sites and/or infrastructure.

In the case of a power outage, EFTPOS terminals will not work unless they have a back-up source of power. Where EFTPOS terminals can access back up power, they will be able to continue operating as normal if the mobile network is still operating, but if the mobile network is also impacted only terminals that have electronic fallback or utilise a Telstra enterprise satellite product will be able to continue operating.

In addition, satellite connectivity also has vulnerabilities as satellite signals, for example, can be affected by heavy clouds or storms and satellite dishes can be damaged by cyclones and bushfires.

We have identified a number of potential resilience options for EFTPOS terminals. These include:

- Exploring use of nbn co's SkyMuster satellite as a back-up connectivity option (noting this option requires access to power in order to be operational);
- EFTPOS terminal suppliers could explore allowing transactions up to a certain limit (per customer and/or in total) to be processed for a terminal disconnected from the payments network as a resilience measure (noting this option also requires access to power in order to be operational); and
- Banks or other payment entities could develop a variation on the old-style click/clack credit card mechanical slips for low-value transactions, an option that requires neither power nor mobile connectivity.

3.4. Fixed line resilience and service performance for basic telephony

We have invested more than \$1.3 billion in our regional fixed networks over the five years to June 2021. This investment has occurred across more than 4,000 Exchange Service Areas (**ESAs**) that are within regional areas, including a mix of wideband, fibre and fibre capacity extensions, inter-exchange connectivity upgrades, improvement works to buildings and our equipment, resilience measures such as battery life-cycle upgrades and other maintenance adding to or improving network assets.

Despite nbn co now reaching 92 per cent fixed line service coverage in Australia, we continue to see growing customer demand across our fixed networks in regional areas, and this has required investment to upgrade fibre paths and establish new transmission rings (providing redundancy) in many locations. Our upgrade activities have also included installing, within multiple exchanges, new high-capacity systems for managing access to broadband services delivered over the copper network. In addition to relieving localised congestion, these investments have also allowed new service connections to be established at many exchanges.

Some of our investment in regional fixed networks is directed towards landline maintenance. This investment has been undertaken to ensure we meet our Customer Service Guarantee (**CSG**) benchmarks and comply with our Network Reliability Framework (**NRF**) obligations, on which we report regularly to the ACMA. Across regional Australia we have been exceeding service level restoration targets established under the CSG standard. We are continuing to be more proactive in our overall life cycle management of the copper access network, from exchanges to customer premises, to increase the resilience of the copper network and support the ongoing delivery of voice and broadband services which operate across it. Notwithstanding these improvements, as we outline in section 7 copper is an ageing technology that is increasingly difficult to maintain, so migration to newer technologies will be necessary to continue delivering services to regional Australians.

Where there is no nbn technology available and the copper network remains, we use network insights, fault data and customer feedback to strengthen our network and improve the customer experience.



These programs mean sending teams of technicians to scope cable pathways and identify remediation and improvement activities. This can often be in challenging terrain and require a number of solutions, including replacing copper cables, fixing aerial cable, replacing and remaking joints (this is a cable join between the exchange and customer premises) and removing network elements where simplifying the network will also improve the customer experience. Pair Gains Systems can be a point of failure and removing these improves network stability for end customers.

We expect these programs to prevent 18,000 faults across this network to June 2022. We have recently removed 350 Pair Gains Systems and intend to increase this to 4,000 over the next 6-12 months.





One of our services which is dependent on the copper network is the high-capacity radio concentrator (HCRC). Questions about plans for HCRC services came up in a number of the RTIRC hearings. The box below covers the short-term outlook for HCRC services.

HCRC services

We currently have just over 10,000 HCRC services, supporting voice services in the 'last 8 per cent' (that is, areas outside of nbn co's fixed footprint). Almost all of these services fall within nbn co's SkyMuster footprint.

While we have no immediate plans to exit this service, noting it is provided as part of our USO obligations, we are monitoring possible future replacement technologies:

- About 5,000 current HCRC services (~43 per cent) may be within reach of a mobile solution, so could possibly be addressable by the 4G fixed wireless product referenced earlier (an early version is currently being trialled as part of the Alternative Voice Trial).
- Low Earth Orbit (LEO) and Geostationary Earth Orbit (GEO) satellites could be part of the technology replacement this is likely still some time away, and would require changes to current USO arrangements in relation to voice services.

Section 6 discusses satellite technology and the future technology horizon we see as playing a role in the delivery of connectivity to regional and remote Australia. While section 7 outlines the policy changes required to effect change.



3.5. Digital inclusion, literacy and awareness

Digital inclusion is a shared and complex national challenge. Businesses, the education sector, nonprofit organisations, community groups and government need to collaborate and cooperate to address the gaps that currently exist with digital affordability, literacy and awareness.

The Australian Digital Inclusion Index (**ADII**) tells us that lower levels of digital inclusion are related to lower levels of education, employment and income. People with disabilities, older Australians, and some industry sectors are at greater risk of being digitally excluded. There is also a significant country–metro divide, with people in rural and regional Australia tending to have lower levels of digital inclusion.

First Nations peoples living in Australia's 1,100 remote communities are among the most digitally excluded Australians. Recent studies show that digital inclusion for First Nations Australians diminishes with remoteness. Affordability is a key issue, driven by a disproportionate use of mobile only and prepaid connectivity. The specific factors underlying the lower levels of digital inclusion need to be analysed in more detail as they differ by community. The Mapping the Digital Gap project will provide a valuable contribution to these efforts, however ongoing research and investment in remote communities is essential.

Resolving First Nations digital exclusion is critically important. The Commonwealth Government recently acknowledged this with the creation of a new Closing the Gap Target (2020, Target 17) for digital inclusion and access to relevant media services, championed by First Nations Media Australia and the Coalition of the Peaks.

We have partnered with the Centre for Appropriate Technology (based in Alice Springs) to deliver a new consumer education program in the Northern Territory called Mobile My Way. In FY22-FY23 the program will be delivered in remote Indigenous communities that have recently received new telecommunications infrastructure to increase residents' awareness and understanding of Telstra products and services.

Addressing the challenges to digital inclusion, especially for regional and remote Australia, must become an integral part of the Government's digital economy strategy and involve collaboration across all levels of government, business, and the community. We partner with the government and community sector to develop and deliver a wide range of digital inclusion programs to assist our most vulnerable regional and remote customers and communities in support of our purpose – to build a connected future so everyone can thrive.

We have recently announced as part of our T25 strategy we will be supporting digital inclusion by helping to keep one million customers in vulnerable circumstances connected and building digital skills for 500,000 Australians.

Our initiatives are predominantly informed through the research findings of the ADII and include programs and partnerships, as well as products and services, that address each of the fundamental components of digital inclusion.

In addition to our significant ongoing investment in our network and adoption of new technologies, including satellite small cells and coverage extension devices, we are also focused on addressing affordability and digital ability in regional and remote communities.

Affordability

- We have the largest and most extensive product offering in the industry for low income, vulnerable and disadvantaged customers (see details below) – providing more than \$3 billion in value since 2002.
- Our Access for Everyone program is designed to assist people with low income or facing financial hardship to maintain access to telecommunications. This includes a range of measures to improve affordability, including the Telstra Home Phone Pensioner Discount and Telstra Top-up program, which provides a complimentary \$40 mobile credit recharge to those who are experiencing or at risk of homelessness, family violence or impacted by natural disaster.
- We have specific plans targeted at vulnerable customer segments including the Seniors Starter Bundle. This was launched in 2016 in conjunction with state government Seniors Card programs. It provides a low cost, entry level broadband solution for those getting started online.



- We have introduced a \$30 / month Value Mobile Offer for eligible customers with a Health Care Card.
- We have given around 100,000 of our voice-only nbn customers access to the internet as part of their existing plan, at no additional cost to them.
- We have removed excess data charges from all new fixed and post-paid mobile plans (i.e. unlimited data for web browsing) to provide cost certainty.
- We are migrating our pre-paid mobile customers on legacy plans to in-market pre-paid mobile plans over the coming months which will give them better value for money through call inclusions and higher data caps.
- We do not charge late fees for customers on direct debit and customers can immediately suspend services as their needs change.
- Boost Mobile offers a range of affordable pre-paid plans on the Telstra 4G network.

Digital ability

Ensuring all Australians have the basic digital skills needed to operate in today's society is a matter of urgency.

We have several targeted digital ability training programs for people who have minimal or no digital literacy skills. These programs help participants understand the internet's relevance to their lives and, how to get started, then support them to build their digital skills and confidence to complete simple online tasks safely.

We are focused on building the digital literacy skills in a range of programs including:

- Tech Savvy Seniors and Social Seniors programs designed to build digital capability in people aged 65+ who are Australia's least digitally included age group, as well as individuals with a language other than English (LOTE).
- **Telstra Safe Connections** provides pre-paid smartphones with \$30 credit to women impacted by tech facilitated abuse. To June 2021, the program had distributed over 28,000 devices.
- Deadly Digital Communities (Qld) and inDigiMOB (NT) programs focus on developing digital capability and cyber safety awareness for First Nations peoples in remote communities, where remoteness and socio-economic disadvantage pose distinct challenges.
- The Telstra Foundation works with community partners to provide access to digital skills needed for the future of work. Through its **Code Club Australia** program and partnership with **Indigital**, the Foundation enables greater digital inclusion of teachers and students across Australia. The Foundation also trains, supports and funds multiple non-profit partners, via **Tech4Good**, to create better technology products and services for diverse, vulnerable, and disadvantaged groups.

Building on Telstra's Tech Savvy Seniors and Deadly Digital Communities programs, we are set to pilot a new digital literacy program in Queensland, Tech Savvy Communities. It is being delivered in partnership with the Queensland Government and local councils for eight regional council areas with populations under 15,000. Learnings from these initiatives could inform an expansion of these programs that could be delivered in partnership with Commonwealth, state, or local Governments nationally.

The COVID-19 pandemic also highlights the importance of digital inclusion for social resilience and economic security. The impacts of COVID-19 will continue to challenge progress, particularly for those who are vulnerable, and the Government has a clear role to play in mitigating this impact.

Additional attention also needs to be given to ensuring regional and remote communities have a place where people can access digital equipment, free Wi-Fi and skills to perform essential online tasks. COVID-19 has reinforced how important it is that all school students can access suitable connectivity and devices for education – wherever they live – at school and at home.



Communities and individuals need to understand what services are available and suitable for their needs. The existing Regional Hubs go some way to addressing this need. In addition, in response to the 2018 RTIRC, the Commonwealth Government committed funding toward the establishment of a Regional Tech Hub. This service, which is being delivered by the National Farmers Federation (**NFF**) also goes some way to addressing this need. However, Government and industry should work together to continue to improve support so that regional, rural and remote Australians can access the technologies that they need to get and stay connected.

Recommendations

2. Improving understanding of connectivity solutions

- a. Fault identification and rectification that all fixed network operators in regional Australia provide transparent reporting on fault identification and rectification to help ensure customers know what they are getting at all times. Greater transparency of the capabilities and performance of fixed network services would benefit customers as they make choices about the best mix of services and service providers to suit their needs. For example, Telstra publishes monthly data on our fault rectification performance broken down by geographical areas (<u>https://www.telstra.com.au/consumeradvice/customer-service/network-reliability</u>), but to our knowledge there is no comparable regional-specific data provided by nbn co or other network service providers.
- b. **Role of regional LGAs** that Government be encouraged to direct funds towards regional LGAs to assist in both raising the levels of understanding of connectivity solutions and technologies most appropriate for their specific communities.

3. Digital inclusion

- a. That Commonwealth and State/Territory Governments, in conjunction with the industry, be encouraged to scale and enhance existing, localised digital inclusion programs that improve digital capability, especially for vulnerable Australians.
- b. That nbn co develop and offer to Retail Service Providers (**RSPs**) an affordable nbn consumer plan to benefit all households receiving government income benefits.

3.6. Customer service

After experiencing significant COVID-19 related resourcing impacts last year, we have invested in our contact centre operations in Australia and improved the resilience of our international operations. At the peak of COVID-19 in 2020, we had to prioritise taking calls from vulnerable customers and customers with a service fault, and we directed other customers to use messaging for some enquiries. This was progressively removed and, from June 2021, all customers can now contact us via their channel of choice.

We have now turned back on the dedicated routing for service calls to our South Australian based team from our regional customers. We also continue to prioritise handling of complex and high risk customer groups, many of whom are in regional Australia.

This includes our First Nations Connect team, a dedicated Darwin-based hub, using staff who are regionally based and of Indigenous descent. This team has been established to support our Indigenous customers and we're also anticipating that some of these calls will be taken and solved in-language for our Indigenous customers.¹³

¹³ https://exchange.telstra.com.au/supporting-indigenous-customers-with-new-centre/



We also have our SAFE team supporting victims of family & fomestic violence and our Specialised Assistance and Priority Assistance teams.

In addition, as part of supporting our regional customers we have committed to:

- answer all voice calls in Australia by 30 June 2022;
- bring our Telstra retail stores back to direct Telstra ownership. We currently have 138 stores in regional locations providing sales and service support to those communities;
- make it easier for customers to call their local Telstra store for support. Telstra store contact
 details have been made readily available through Telstra.com, including the ability for customers
 to book appointments with our store teams;
- make national calls for free from Telstra payphones (which we did in August 2021);
- ensuring that, by FY25, 90 per cent of customer service contacts will be resolved on the first contact - once and done; and
- reduce our customer complaints by 33 per cent by FY23 and 50 per cent by FY25.

Additionally, we have introduced some fall-back options to help customers get the support they need – for example:

- We have introduced a number of mechanisms for our staff to report faults or help customers with a fault (including our field technicians). This includes direct access to back of house teams for our field staff to resolve a fault and an internal site for staff to report issues on behalf of customers, which get picked up and managed by our subject matter experts.
- We have also introduced a range of ways customers can contact us if they are still having problems getting their issue resolved, including a web page on Telstra.com and specialised phone numbers for residential and small business customers.

Expert coverage advice for regional areas

After running a successful pilot, in October 2020 we launched the Regional Advisory Network (Network Adviser), a new program for regional, rural and remote customers to help with their connectivity wherever they are in Australia. Using our experts from across our business, this network provides customers with a range of services from a simple fix to fully integrated and bespoke network solutions to ensure customers are able to make the most of their connection using our regional footprint.



The Network Advisor program has been designed to help customers who are having connectivity issues in their home, business premises or on the road. We want to be able to fix these problems the way that our regional customers need - by putting the right people on the job who understand the issue in detail and who can recommend a solution.

Our dedicated regional team have deep technical knowledge, understand the reality of regional connectivity and are able to help all customers make the most of our network.



4. Telecommunications in disasters

4.1. The role we play

As the country's largest telecommunications provider, we play an important role in the community when it comes to facing disasters and emergencies. Staying in touch is something most of us take for granted during the best of times, and we understand its importance during the worst of times. This is one of the reasons we made the decision to make our national network of 15,000 payphones free for use, given the critical nature they play in disaster and emergency situations when communities are vulnerable.

4.2. How we manage natural disasters

In our long history we've had considerable first-hand experience dealing with disasters, which helps us prepare for future events. We proactively monitor threats so that, when disasters hit, we already have tailored plans ready based on previous planning and the current situation. After a disaster strikes, we reenter that area as soon as emergency services inform us that it's safe, so we can start restoring services for impacted communities and those supporting the important work of rebuilding.

Our network, field, emergency management and other teams work year-round to prepare for natural disasters. We have State-and hazard-specific plans in place to prepare for, respond to and recover from those events. We start testing our network, refreshing our plans and preparing our infrastructure in the lead up to the disaster season. This includes:

- testing our back-up network infrastructure, such as alternative transmission paths and temporary infrastructure;
- identifying and remediating optic fibre transmission cables in remote locations which have become exposed from previous wet season floods and other events;
- assessing battery back-up reserve capacities;
- for those critical sites that have a permanent onsite generator, ensuring the generator has adequate fuel reserves and is functioning correctly;
- site inspections and remediation activities to address potential areas for water/rodent/ember ingress, infrastructure damage, air-conditioning faults, vegetation growth within the site compound and site accessibility (access tracks);
- sandbagging potential at-risk exchanges where there is an imminent potential impact and we are able to do so; and
- ensuring we have continuity plans for critical staff.

When restoring infrastructure we first prioritise our core network. This forms the backbone of our network and without it we cannot provide services. After our core network, we prioritise services for emergency services agencies and others directly related to the disaster response, as well as communities in isolation. Our Emergency Services Liaison Officers (**ESLOs**) work with local and state emergency services to support their communications needs and ensure we prioritise the restoration of critical emergency and utility services. We leverage our national teams of field technicians and contractors to ensure we have the right people when and where they're needed.

Following a disaster, we set up a community response team to support our customers in the area, with a dedicated 1800 number answered by Australian-based consultants to help them access our assistance packages. Those packages can include diverting calls from an impacted home or business phone to a mobile, providing additional mobile data, providing pre-paid top-ups and (for customers displaced from their homes or businesses) waiving connection fees.



Temporary Infrastructure

We have temporary infrastructure at key locations around the country to expedite deployment after a natural disaster has damaged our permanent infrastructure, including:

Mobile Exchanges on Wheels (MEOWs): these are primarily used to restore landline phone and ADSL broadband services, along with providing downstream transmission capacity, where an exchange has been heavily damaged and will take weeks or months to be repaired or rebuilt. These may take several days after being transported to site to become fully operational.



Different Mobile Exchange on Wheels (MEOW) units

Cells on Wheels (COWs): used to partially replace or supplement mobile network coverage following a disaster. Like MEOWs, these may take several days after being transported to site to become operational.



Cell on Wheels

Satellite Cells on Wheels (SATCOWs): A SATCOW is a COW which uses satellite transmission to connect to Telstra's broader network. Some SATCOWs are air-transportable, making them the fastest deployment option available. However, by their nature they provide a smaller coverage footprint and more limited bandwidth than other COW options. In addition, due to the inherent latency (delay) experienced when using satellite communications, a SATCOW is not a deployment option if any other neighbouring mobile coverage is present as it could disrupt other mobile communications to the area.



Fly-away Satellite Cell on Wheels (SatCOW) – both set up and ready for transport by helicopter



4.3. Power resilience

Recent experience shows the vast majority of service interruptions following natural disasters are due to loss of mains power.¹⁴ Our sites have site-specific back-up power arrangements (typically batteries, but also permanent generators at some critical sites) to provide power resilience during mains power outages.

We have increased our investment in power resilience since the Black Summer bushfires, and have replaced batteries at over 2,000 network facilities nationally over the past two years. In addition, with assistance from the Australian Government's Strengthening Telecommunications Against Natural Disasters (**STAND**) program, we are upgrading back-up batteries to at least 12 hours reserve at over 340 mobile sites nationally.

The role of the battery is to maintain continuity of telecommunications services during short power interruptions only. Where power interruptions are expected to extend beyond the battery reserve limits, this reserve also provides the valuable time needed for staff to attend sites when safe to do so and support the network with a portable back-up power supply (generator).

Our experience from the Black Summer bushfires was that even if 12- or 24-hour battery reserves had been in place at all affected Telstra mobile sites, most outages at those sites would still have occurred. This is due to a combination of factors including the scope and severity of the fires, access issues and most significantly the length of the mains power outages. A key consideration is that back-up solutions are generally site specific, but mains power outages during times of natural disasters can have broad geographical impacts which take out not just mobile sites, but supporting transmission infrastructure which also requires power.



Figure 5. Jingellic mobile and radio tower with portable generator at front, following the Black Summer bushfires

Despite the serious challenges major power outages pose to the operation of our network during times of natural disasters, we make extensive use of portable generators to mitigate impacts. For example, we deployed over a hundred portable generators during the Black Summer bushfires, pre-positioning many of them on the edge of fire-affected areas so they could be in place as quickly as possible. These are not a panacea as generators also have challenges, such as refuelling requirements which in turn require ongoing access. We are currently working to make it easier for third party generators to be used with our infrastructure to keep it up and running, and also for communities to refuel our generators. At some sites

¹⁴ https://www.acma.gov.au/publications/2020-04/report/impacts-2019-20-bushfires-telecommunications-network



we also use a combination of solar panels, batteries and permanent back-up generators to provide power. However, this is not feasible for all sites and in any case still requires sufficient sun to power the solar panels and fuel to run the generators, neither of which may be available during a disaster. We note that for our site at Mt Terrible below, we fully utilised all of the space that was made available for our power equipment, and this in turn required greater use of diesel in place of more solar.



Figure 6. Telstra tower at Mt Terrible, Victoria – powered by solar panels, batteries and permanent onsite diesel generators.

Back-up power sources will always have their limitations, and similarly it is not reasonable to expect telecommunications providers to implement other alternative power solutions for the equipment and sites that make up their networks in order to try to manage extended mains power outages. Power utility companies are responsible for mains power resilience and for restoring mains power where outages arise, and via our peak industry body (the Communications Alliance) we're working with the electricity industry to improve collaboration and information sharing so there is better visibility of overall priorities, and by extension, service restoration times. Additionally, in some locations power companies are working with us to install Stand Alone Power Systems (SAPS) to improve the reliability of electricity supply to our infrastructure.

4.4. Action on climate change contributes to resilience against natural disasters

As highlighted by the Royal Commission into National Natural Disasters Arrangements last year, climate change is leading to more frequent and more severe natural disasters. It is also a point noted by this RTIRC that since the last review in 2018 there have been many severe natural disasters that have impacted large parts of regional Australia. We're taking action to reduce our contribution to climate change. We've been certified carbon neutral in our operations by Climate Active since July last year. And we're going further, investing significantly in Australian renewable energy generation and committing to reducing our absolute greenhouse gas emissions by 50 per cent by 2030 (from a FY19 baseline).

4.5. Emergency roaming and Cell Broadcast Emergency Notifications

We understand the importance of receiving critical information during an emergency and are conscious of proposals for roaming between carrier mobile networks as a way to improve access to critical information during emergencies (emergency roaming).



The global mobile standards body, 3GPP, have started working on a mobile network standard to support emergency roaming, although a commercial grade solution is likely still some years off. Without an emergency roaming 3GPP standard, any large-scale failure of one network could result in connection failures and congestion for all users (existing and roaming) on the remaining in-service network as that network would be "overwhelmed" by the abrupt addition of a high volume of new users, which combined with existing users may be far beyond the normal demand that network is able to meet.

In the interim, we believe there are better and more readily available solutions than emergency mobile roaming to address concerns about access to information during natural disasters.

The best solution to address concerns about access to information during emergencies is **Cell Broadcast emergency notifications**. This technology, widely used internationally, can broadcast emergency warnings to large volumes of nearby recipients instantaneously via mobile networks. Like Triple Zero calls, it works even if a mobile handset is on a different network to the base station sending out the message, without the complexity of roaming. We welcome the funding allocated by the Australian Government in its 2021-22 Budget to design a National Messaging System (**NMS**) based on Cell Broadcast technology. We support the allocation of further funding to complete implementation of that system and extend the use of Cell Broadcast to other emergency notification applications.

Regardless of approach, it's important to note that neither emergency roaming nor Cell Broadcast emergency alerts are guaranteed solutions to ensure connectivity during emergencies and natural disasters. Widespread power disruption or damage to fibre backhaul will likely impact all carriers' coverage in an area. Similarly, in many cases carrier cell sites are collocated on the same site and/or towers so any physical disruption as a result of natural disaster (whether fire, flood or storm) will again disrupt coverage for all carriers. Maintaining access to alternative communication such as satellite phones that are less impacted by localised terrestrial disasters should be an important part of any emergency communications back-up strategy.

In order for Cell Broadcast to be implemented, it will require additional investment from the Commonwealth Government and we believe it is important that the Government make commitments to fully implement Cell Broadcast emergency notifications nationally.

4.6. Public Safety Mobile Broadband (PSMB)

We support the implementation of a National Public Safety Mobile Broadband (**PSMB**) network to provide high-capacity mobile connectivity for emergency services agencies. We agree with the findings of the Productivity Commission report in 2016 that mobile broadband (including via a PSMB) offers significant potential to improve how police, fire, ambulance and other PSAs deliver their services and communicate with each other.

However, the proposed network architecture for the PSMB Proof of Concept (**PoC**) — a separate network with dedicated spectrum plus roaming onto commercial carrier networks — would be (as far as we can ascertain) unique and not used anywhere else in the world. We are also not aware of any country (other than Belgium) which has implemented roaming for a PSMB.¹⁵ PSMB roaming has been examined and reported on in detail by the Productivity Commission, which noted that "implementing a multiple-carrier option would be complex", involving higher costs and "a risk that technology upgrades would be delayed … given the need to coordinate such upgrades across multiple network operators".¹⁶

¹⁵ The Productivity Commission described the Belgium case as "not considered a mission critical service" and without "an ability to seamlessly roam across networks": https://www.pc.gov.au/inquiries/completed/public-safety-mobilebroadband.pdf page 284.

¹⁶ See https://www.pc.gov.au/inquiries/completed/public-safety-mobile-broadband/report/public-safety-mobilebroadband.pdf page 24.



Consistent with the findings of the Productivity Commission, we believe that an architecture which involves a partnership model using an existing mobile network with a lead carrier would be significantly less expensive and faster to implement than the current proposed PSMB architecture. Such an approach would also be consistent with the model utilised in a number of foreign jurisdictions, including the United States of America and the United Kingdom.

Recommendation

- 4. Mobile resilience that the Commonwealth Government:
 - a. continues to support the Commonwealth Government's Strengthening Telecommunications Against Natural Disasters (**STAND**) program; and
 - b. commits to implementing and funding Cell Broadcast emergency notification capability to enhance regional resilience in natural disasters.

5. Driving innovation through technology and connectivity

We are deeply committed to vibrant and sustainable rural and regional communities. An essential part of that is enabling the industries that support and grow those communities. In addition to our market leading mobile coverage footprint, we also support an extremely wide availability of Internet of Things (**IoT**) solutions with 3 million km² LTE-M coverage and around 4 million km² in Narrowband IoT (**NB-IoT**) coverage today — these levels of coverage will grow further by June 2024.¹⁷

Our industrial IoT solutions focus on smart infrastructure, using sensor technology and leverage data to improve the customer experience. Together with our professional services, we are in a position to help customers monitor their assets by digitising their physical environment and providing new insight into their business so they can protect what matters most.

Applied in the rural setting, deployment of our solutions has helped customers save precious resources, optimise processes and logistics, and improve their safety.

5.1. Agribusiness & supply chain: The food & fibre value chains

Agribusiness is one of the biggest drivers of Australia's rural and regional economies. It is also an industry that is still at an early stage of digitisation.

We note the ABAC Agri-Tech Expert Working Group report pointed to 'salt and pepper connectivity' being a major barrier to the widespread adoption of technology across the agricultural sector.¹⁸ Whilst acknowledging that connectivity is a challenge for agricultural technology (**AgTech**) adoption, we believe it is important to recognise that there is an evolving range of connectivity solutions targeted at AgTech (including low earth and geostationary satellite networks, and alternative wireless technologies), of which cellular connectivity is only one option (see section 6). We also note that the agribusiness use cases in regional and remote Australia are many and varied. It is difficult to set out the appropriate connectivity to service the industry without first understanding the needs of those use cases, many of which are not reliant on continuous high-speed connectivity. For example, applications such as water meters, rain gauges, and location sensors require only low bandwidth and can involve infrequent connections – these are best served through the extended coverage of technologies like NB-IoT. Others generate so much

¹⁷ LTE-M and NB-IOT have been approved by 3GPP as 5G MMTC (Massive Machine-Type Communications) technologies — that is, they are considered 5G for this use case.

¹⁸ ABAC Agri-tech Expert Working Group report. Released 10 September 2021. Source:

https://www.communications.gov.au/documents/agri-tech-expert-working-group-june-2021



data that transmission via the mobile network is simply not feasible, and they are best served by placing processing capability very close to site using technologies such as edge computing.

We are actively working with the industry to help drive digitisation which, in turn, forms a platform for innovation, greater competitiveness, higher yields, increased margins and better access to markets.

We are a foundation partner in AgriFood Connect – a Toowoomba based, industry-led, national collaboration network seeking to radically improve translation of Australia's great research into adoptable, commercially viable solutions for participants in all sectors of Australia's AgriFood supply chain. AgriFood Connect will drive focused innovation, extension and translation programs addressing industry needs. A key focus area is translational education programs centred around digital skills. We have committed to create an open Advanced Technology Solutions Centre in Toowoomba in conjunction with AgriFood Connect. This will enable individuals, organisations and solution providers to learn about advanced digital technologies including IoT, 5G and edge and cloud computing and importantly, to rapidly develop, test and validate commercial solutions using them.

Whilst Australia's rural and regional industries and the supply chains that service them are used to dealing with volatility and change, the past two years have been extremely challenging, with businesses dealing with the impact of drought, floods, bushfires, a global pandemic and the economic disruption that has followed. Australian businesses face different challenges to other nations including greater climate variability and long, volatile supply chains. We see access to accurate and timely data as critical to enabling resilient industries that respond more quickly to disruptions to import and export supply chains and to production.

We are creating a portfolio of products and tools to better support businesses in managing their supply chains. One key capability is creating transparency over those supply chains, which especially benefits regional customers. Going forward we will expand on this proposition to further improve productivity and logistical offerings.

5.2. Telehealth

Access to reliable telecommunications and internet services is increasingly important for healthcare.

The majority of health and aged care providers use digital health software and systems to access and maintain patient records, for clinical decision support, and to communicate with patients, other providers and national systems such as the My Health Record and National Cancer Screening Register. Being able to use and access these systems has direct benefits for patient safety, reduces the need for patients to travel long distances for care, as well as efficiencies for healthcare providers. In areas that are impacted by regular weather dependent power, phone and internet failures, hybrid paper systems need to be maintained and those communities do not fully benefit from digital health.

Since early 2020, the number of people across Australia accessing care virtually has dramatically increased including adoption of telehealth, electronic prescriptions and remote (at home) monitoring. This has been driven by barriers to accessing face-to-face care for those in remote areas during the 2020 bushfires, and COVID-19. This has enabled more people to access care from home during lockdowns and to protect healthcare workers from unnecessary exposure risk during the pandemic. For example, remote monitoring of COVID-19 patients convalescing at home has been commonplace. Importantly, increased adoption of telehealth has been enabled by policy changes to the Medicare Benefits Schedule, and regulations governing electronic prescriptions.

Increased adoption and enabling policy changes mark a watershed for telehealth in Australia, although the ultimate benefit and equity of digital health will be dependent on reliable telecommunications services.

5.3. Education

Our many partnerships with Education bodies demonstrate our commitment to regional Australia. Over the past two years we have undertaken the following programs of work:



- South Australian Education delivered high-speed fibre optic cable to more than 500 schools, provided internet speeds of up to 1GBps and delivered improved connectivity to regional towns across South Australia.
- NSW Education delivering speeds of up to 1Gbps to more than a thousand schools, upgraded over 500 exchanges across regional NSW and boosted internet connectivity for regional business in towns like Grafton.
- Western Australia delivered high-speed fibre optic cable to more than 700 public schools, an
 investment of around \$30 million upgrading local exchanges and backhaul capacity in regional
 towns which provides a platform for accelerating 5G mobile rollout within regional areas.

We are continuing to work closely with Education Departments in both Victoria and Queensland with the aim to provide similar outcomes for teachers, students and regional communities.

These programs have benefited regional communities in a number of ways:

- Helping provide equity of internet access for students in regional areas, enabling contemporary teaching methods for STEM and improved learning and development capabilities for teachers.
- Reducing or eliminating upfront costs for business and governments who want to get a new connection to the internet or improve their existing connection. In South Australia we have seen this help attract business investment in regional areas.

Working with an independent third party we were able to demonstrate the economic benefit for South Australia of this investment:

- Prior to COVID-19 impacts, between \$1.8 and \$2.2 billion were forecast to be added to South Australia's Gross State Product (**GSP**) over the next 10 years as a result of the SWiFT program.
- The potential to add over 14,000 new jobs, many in regional areas, over the next six years in the fields of ICT, construction, finance, education, health and more.

5.4. Importance of cyber security

Even before COVID-19, cyber security was a large and growing area of risk that went to the very heart of the safety and security of the nation, of every family and business, regardless of where they are.

We acknowledge the leadership the Commonwealth Government is taking on cyber security as part of the digitisation of the Australian economy. This includes the establishment of Australia's expert Industry Advisory Committee (IAC) on cyber security, chaired by Telstra's CEO Andy Penn, which aims to ensure industry continues to help shape the delivery of actions set out in the Cyber Security Strategy 2020.¹⁹

COVID-19 has amplified the cyber security risk because so many of us are now working and studying from home. This means activities we used to undertake within the traditional and sophisticated firewalls of enterprises, governments and education institutions are now being completed from home over VPNs. As an organisation responsible for enabling so much of today's connectivity, and as one of Australia's largest companies, we certainly feel the responsibility to continue to help our customers to stay connected. We also feel the responsibility to keep our customers safe from cyber risk and cyber-attack which, unfortunately, remain a clear and present danger.

Many of our customers do not have the resources to adequately protect themselves from cyber threats. We have been working on a Cleaner Pipes initiative to reduce instances of customer data being compromised through malware, ransomware and phishing. This involves significantly upscaling our

¹⁹ Source: <u>https://www.homeaffairs.gov.au/about-us/our-portfolios/cyber-security/strategy</u>



Domain Name System (**DNS**) filtering, where millions of malware communications are being proactively and automatically blocked every week as they try to cross Telstra's infrastructure, as well as other initiatives.

To support our enterprise customers, we have launched and are constantly reviewing a suite of solutions and managed services that help customers protect themselves from cyber-attacks. These include security assessments and recommendations, simulations to check vulnerability, as well as advisory and governance services for ongoing protection. The aim is to empower our customers to assess their level of vulnerability and assist them in implementing the right solutions to keep their data and the data of their customers safe.

Since the onset of COVID-19, we have seen some small businesses (**SMBs**) strive forward. Some are using online platforms and services to sell direct to consumers. Others are using collaborative tools to enable their teams to work from home. However, many really struggle to get moving. Our customers and stakeholders tell us that they can see the benefits of using online platforms and services but lack the time and expertise to fully utilise and benefit from them. In response, we have created end-to-end solutions that allow us to set up digital solutions and run them for SMBs. These services include IT support, Cyber security services, digital marketing services such as website building tools, collaboration tools and connectivity. We have also launched a 'Go Digital' consultation service for small businesses where we work with them to analyse the specific digitisation opportunities for their business and build them a bespoke roadmap for digitisation, which they can take away and use. We find this helps many businesses who simply don't know where to start.

6. Future technology to deliver regional connectivity

6.1. Our deployment of 5G in regional areas is creating further opportunities

5G is the newest mobile technology and will play an important role in helping Australia participate in an accelerated digital economy. 5G offers end users a new frontier of connectivity experiences with even more capacity and faster speeds, building on the foundation that 4G provides today. Significantly, and unlike other carriers, we aren't restricting our 5G rollout to metropolitan areas.

More than 75 per cent of Australia's population is now covered by 5G and around 1.6 million 5G devices are connected to the Telstra network. There are over 3,800 Telstra 5G sites on-air across the country, providing coverage in more than 240 cities and towns (including over 200 regional cities and towns) and over 3,200 suburbs. Our customers are increasingly accessing this technology, with the number of 5G devices on our network growing each week.

Our 5G deployment is mainly based on our 3600 MHz spectrum, with significant bandwidth to support upload and download speeds that are better than 4G and providing more capacity to support our customers. In many regional locations we have also added 5G using some of our low-band 850 MHz spectrum freed up by the decline in 3G traffic referenced above. The use of 850 MHz spectrum helps extend 5G further and deeper into buildings, and its relatively better propagation compared to 3600 MHz means our 5G signals have additional reach from sites where it is deployed. These attributes make the addition of this low-band 5G layer especially important for regional 5G coverage.

In our recent T25 strategy announcement, we committed to maintaining our investment in leading networks, including our mobile network. Our customers will keep enjoying our investment in 5G, which will reach 95 per cent of the population by the end of FY25. We will also be delivering a 100,000 square kilometre increase in our existing mobile footprint, substantially increasing regional coverage.

6.2. Satellite technology and looking to the horizon

Satellite technology often plays a complementary role in the connectivity needs of some people in regional Australia, and in some instances is the only option available. It will likely remain the only option where connectivity via a terrestrial network (fixed or mobile) is not available or not viable (either technically or commercially). Australia has such a vast and sparsely populated land mass it is not viable



to provide mobile or fixed coverage to the entire country, and so there will always be a role for satellite technology.

We currently use a Geo-stationary Earth Orbit (**GEO**) satellite to deliver telephony services as part of our USO obligation to some customers in remote areas. A GEO satellite is suitable for this use case as it relies on established technology, is stable over time, and can provide a large coverage footprint with a single satellite. While today the GEO satellite only provides telephony services, GEO technology has been steadily improving over time. GEO satellites can also provide data services, as currently used by nbn co to provide broadband in some remote areas, and the next generation of satellite systems are expected to provide a step change improvement in capacity compared to what is available today.

One of the emerging satellite technologies is Low Earth Orbit (**LEO**) satellites, and while there are challenges to overcome, this technology may ultimately provide greater capacity and more responsive communications (with lower latency) than what is possible via GEO satellite technology. LEO satellites orbit much closer to the earth than GEO satellites, which means it takes far less time for signals to travel to and from the satellite. This is important for real-time communications like voice and video conferencing. Additionally, as LEO satellites involve large satellite fleets, they can offer greater capacity relative to other satellite options.

We will continue to monitor developments with GEO and LEO satellites (and other High-Altitude Platforms) and are engaging to understand the economic and technical viability, commercial models and service capability of these solutions.

Of particular interest is the potential for these technologies to bring connectivity suitable for high quality voice and fast data services to residential customers in regional and rural areas as a possible future replacement for ageing copper-based ADSL technology outside the nbn fixed and fixed wireless footprints, and for copper and HCRC-based fixed voice technology outside the mobile network footprint.



Below is a graphic showing the current availability of satellite solutions and our estimated availability dates for some of the future products and technologies discussed above (Figure 7).

Figure 7. Estimated availability dates for future products and technologies (not exhaustive; * denotes timing is subject to change)

As part of our T25 strategy, we announced that we will be launching a satellite service in FY23.

The use of alternative technologies in the delivery of connectivity for regional and remote Australia is hindered when policy is directed toward specific technology solutions. Taking a technology agnostic approach to telecommunications policy would help to deliver the environment that supports future technologies. This is covered in more detail in section 7 of this submission.



6.3. Investment in fibre in regional areas

Telstra InfraCo is the leading provider of passive fibre infrastructure in Australia, with Australia's largest business fibre footprint. As the first organisation to lay fibre in Australia in 1987, we have decades of experience in building and managing fibre in Australia. This includes our regional and intercity fibre network, which connects all regions across Australia with redundancy routes and unparalleled capacity with over 250,000 sheathed kilometres of fibre nationally.

Our fibre network enables fixed and mobile telecommunications services in regional Australia from Telstra, nbn co and others. It also supports essential government services in regional areas including the Department of Defence and state schools. Fibre is also a key infrastructure underpinning innovation and growth in regional areas.

7. Shaping policy and programs for future telecommunication needs in regional and remote communities

As outlined in section 1.3, while our obligations under the USO relate to providing a standard voice service and payphones, through the policy of successive governments, the last decade has seen nbn co given accountability to connect all Australians with high-speed broadband, no matter where they live or work. This policy was designed to ensure ubiquitous availability of high-speed broadband and increase competition in the market.

nbn co uses fibre-based technologies to meet its obligation in built up areas, and fixed wireless and satellite in regional Australia. Importantly, the nbn rollout has been declared complete. This is an important point because while Telstra and other providers may choose to offer non-nbn based broadband solutions to customers in a competitive market, it is not our accountability to do so should a broadband user not be satisfied with their nbn performance.

Provision of mobile connectivity – both voice and data – is a different matter. In a commercial market, like Optus and TPG (Vodafone), we invest where it is commercially viable to do so. This has been the case since the Government finalised the sale of Telstra to Australian shareholders in 2006. Since Telstra was privatised the size and scope of our investment in mobile coverage and technology has been unequalled. This investment has played a critical part in Australia being ranked first in the global Mobile Connectivity Index which assesses networks based on performance, affordability and availability.

The scale of the Australian landmass and concentration of our population density means that economically it is not feasible to expect all of Australia will receive mobile coverage. The cost of investing, delivering and maintaining services in large parts of Australia is not commercially viable. We continue to work with customers, communities and Government to deliver the most extensive mobile network to regional Australia, but there is a limitation to the extent that coverage can be delivered.

7.1. Role of government programs in supporting regional connectivity needs

There are a number of government policies and programs focused on supporting the connectivity needs of Australians living in regional areas. Foremost amongst these is the Universal Service Guarantee (**USG**) for the delivery of voice and broadband services for all Australians. Under the USG, nbn co is responsible for delivering broadband services and we are responsible, as part of the USO, for delivering fixed telephone services using our existing copper and radio networks in nbn fixed wireless and satellite areas. Unlike nbn co, which is able to use satellite and wireless technologies to meet its broadband obligation, in most cases we are required to use the ageing copper network to meet our voice obligation. In recent years several new programs focused on co-investment with mobile network operators (**MNOs**) to improve regional mobile coverage have been established.

Sections 7.2 to 7.5 set out our views on the role of programs we're involved with in supporting connectivity in regional areas, and potential future changes given ongoing developments in technology and community expectations.



7.2. Telstra Universal Service Obligation Performance (TUSOP) Agreement

The Telstra Universal Service Obligation Performance (**TUSOP**) Agreement between Telstra and the Commonwealth was one of the original nbn Definitive Agreements. The TUSOP Agreement commenced on 1 July 2012 and continues to define our obligations to provide telecommunications universal services across Australia and its island territories.

Under the TUSOP Agreement, we have significant obligations and responsibilities for delivering a range of telecommunications services in regional areas. These obligations include provision of the national Emergency Call Service (i.e. Triple Zero), assistance to voice-only customers migrating from the Telstra copper network to the nbn Fixed Line Network, provision of Telstra payphones and provision of STS. We consistently meet our demanding annual operational performance obligations under the TUSOP Agreement, and we've introduced innovation into a number of aspects of the USO which benefit a range of vulnerable and disadvantaged, as well as mainstream, customers.

Recent examples of innovation delivered through the TUSOP Agreement include making all Telstra payphones free of charge for national calls on a permanent basis, and the rollout of Advanced Mobile Location (AML) technology for the Triple Zero service.

Payphones were first made free of charge in approximately 570 remote Indigenous communities at the start of the COVID-19 pandemic. The success of this initiative saw it extended to all 15,000 Telstra payphones Australia-wide. Reaction to this initiative has been particularly strong in regional locations and since the announcement usage of payphones has more than doubled.

AML technology assists emergency services — fire, police or ambulance — to pinpoint the exact location of Triple Zero callers and has the potential to save lives across Australia. The technology allows mobile phones to send precise location coordinates when a call to Triple Zero is made.

While the TUSOP Agreement has been amended by joint agreement on 10 occasions since its inception, we consider further amendments are necessary and appropriate so the TUSOP Agreement continues to evolve with changes in telecommunications technology to deliver better outcomes for Australians living and working in regional areas.

Some current provisions of the TUSOP Agreement limit our flexibility and discourage investment in providing innovative digital solutions based on the most appropriate technologies. We continue to advocate for USO reform in order to better meet future regional telecommunications needs. These matters are discussed further in section 7.3 below.

The TUSOP Agreement Module B annual payment of \$230 million (excluding GST) is funded from the Telecommunications Industry Levy, of which Telstra is the largest contributor. In practical terms, this means we contributed approximately \$94 million (41 per cent) of the \$230 million annual payment we received for service delivery under Module B in 2020.

7.3. Policy settings required to meet regional community needs

The Commonwealth Government's USG envisages the efficient and ubiquitous delivery of high-quality voice and broadband services for all Australians, no matter where they live or work. This is a commitment to our regional, rural and remote communities that we fully support and have a central role in delivering. However, for the USG to be fully realised and remain relevant far into the future it must be technology-agnostic, so that customers are not tied to a single technology that will inevitably age and become less relevant over time.

The greatest barrier to achieving a technology-agnostic USG is the current requirement for us to use the old copper network to deliver telephone services, in most cases outside the nbn fixed line footprint. This copper has served us well for many decades, but it is now approaching the end of its useful life. There are already a range of technologies that provide better-performing, more resilient telephone services than is possible over copper including fixed wireless, and there are more that will be available in the near future, including low latency, Low Earth Orbit satellite services (as outlined in section 6.2).



We understand the desire for regional communities to have access to new technologies and to expand their range of communications options, but it will be much more difficult to deliver on this desire if we are required by Government policy to continue investing in maintaining the ageing copper network. This requirement is holding back the development and large-scale rollout of new technologies. The resiliency and redundancy concerns that have generated support for copper in the past are now squarely addressed by the expanding range of distinct networks becoming available in increasingly remote areas. If one network fails, there will be others to maintain connectivity.

To its credit the Government has recognised the importance of alternative communication technologies to the future of regional Australia by funding the Alternative Voice Services Trial. Under this program we have deployed 4G fixed wireless and low-impact USO satellite telephone services, and we are partnering with nbn co to trial its fixed wireless and satellite solutions. Although it has been challenging to attract customers to the trial, we are confident it will illustrate the strength of these alternatives to copper and rightly increase confidence in them

Recommendation

5. USO reform - that the USO for basic telephony services be reformed to focus on outcomes to be delivered for customers rather than the technology used to deliver those outcomes. The USO could be reformed to ensure that the entity responsible for the USO be required to provide at least the same level of coverage, resilience and quality using technology that best delivers and enhances these outcomes over time with the nbn broadband services used to provide voice back up services for these communities in the event that the primary service were to fail.

7.4. Areas of potential change to the MBSP

Government co investment programs, such as the MBSP and RCP, have been critical and have supported commercial operators to successfully deliver mobile coverage.

However, with the MBSP the main challenge is that after five rounds and hundreds of new black spot site builds, most remaining black spot candidate locations are increasingly remote and costly to build and operate while also benefiting fewer customers. This makes many of them commercially unviable without reform to program guidelines.

We have identified several potential changes to the MBSP, as summarised below:

- Removal of the government \$500,000 funding cap the declining economics of mobile black spot sites makes it more difficult to find sites that are economic to bid for even with government contributions. Removing the cap while still awarding funding on a value for money basis would help support the delivery of new coverage for areas unserved.
- Extend the definition of MBSP eligible solutions to include coverage extension devices and satellite handsets the use of coverage extension devices for vehicles can dramatically increase existing coverage for those who use it and need it most. Extending the coverage of existing mobile towers via coverage extension devices is the most cost-effective means of providing new handheld coverage in areas with poor economics due to sparse populations. Subsidy programs for coverage extension devices could be targeted to customers who are likely to benefit from them the most. Satellite handsets can be an effective and resilient way of attaining coverage in areas prone to natural disasters (especially when a natural disaster occurs) and should therefore be candidates for funding. Any subsidy program for satellite handsets could also be targeted, possibly focusing on local government groups and/or organisations involved in disaster assistance activities.
- Extend the MBSP to include new indoor coverage, or infill coverage, in urban fringe, rural and remote areas – for many customers who raise concerns over coverage the issue is patchy, unreliable and/or absent indoor coverage. These customers often perceive the experience they are having to be the result of a wider black spot. Recognising new in-building coverage would address areas where customers find existing coverage does not meet their indoor performance expectations.



- Extend funding to cover ongoing operational costs while the MBSP has recently allowed government contributions to be put toward some ongoing costs such as satellite and backhaul, other costs associated with the ongoing operation and maintenance of sites in regional locations are excluded.²⁰ These operational costs for remaining remote sites typically well exceed any revenue that can be expected from the sites which means they would run at a loss regardless of how much Government contributes toward the build. Operational costs that could be opened up to government contributions include the costs to maintain and upkeep primary solar powered systems, and for the costs to deploy maintenance staff to sites in very remote and disaster-prone areas, especially when this requires unusual seasonal costs (e.g. far northern Australia in monsoon areas may require helicopter access during flood season).
- Allow funding to be allocated for new and upgraded capacity backhaul links where these directly support new or improved mobile coverage upgrades to existing fibre backhaul and core capacity should be considered eligible for funding where these directly support new or improved (e.g. technology upgrades) mobile coverage in rural and remote areas. These areas of investment will maximise the use of existing infrastructure to support new coverage and provide cost effective solutions to the MBSP. It would also help address network congestion concerns as outlined in section 3.2 of this submission.
- Extend black spot qualifying criteria to include public Wi-Fi or public broadband deployment
 proposals that include the provision of public Wi-Fi (or any other mobile network wireless
 broadband medium) in addition to mobile coverage could be factored into the MBSP guidelines.
 This would provide customers of other operators with access to data services outside of their
 mobile coverage. Calls and texts could also be made using voice and SMS over Wi-Fi technology
 or via over the top (OTT) voice and messaging services through third party applications.
- Government linking literacy and awareness program funding to awarded co-investment locations to support and better leverage the improvements made to connectivity in a specific region (see section 3.5).

While changes to program guidelines such as those outlined above are one way to support improved connectivity in regional and rural areas, challenges are also frequently encountered around site acquisition and associated approvals. Local and State/Territory Governments can play a role in supporting site acquisition and associated approvals to reduce the challenges in the deployment of solutions.

Finally, RCP is a welcome addition to the government programs supporting regional Australia because the program's focus is far broader than mobile black spots alone. RCP provides a degree of flexibility that we support and allows for a wider range of connectivity solutions to be considered to meet the needs of regional and remote communities.

Some of the benefits of the RCP include:

- Support for a broader program of activity that can allow for upstream build (in particular, transmission upgrades), not just downstream coverage. This means we can undertake works that improve capacity and end customer performance as well as basic connectivity.
- For mobile projects it is less prescriptive as it allows for improvement in coverage depth not just new outdoor coverage, so we are able to better address black spots in indoor coverage.
- It is not focused on narrow specified prediction thresholds or metrics such as the area of new outdoor coverage, rather allows a more holistic consideration of social and economic community benefits to be considered.
- More flexibility to combine different projects, without firm single solution funding caps.

²⁰ We note that the draft guidelines for the Peri Urban Mobile Program (PUMP) provide for Government co-contributions to be directed towards opex. This is welcome, but we have not seen this provision to date in guidelines for the MBSP.



Recommendation

6. **Co-investment programs** - building on the strengths of programs such as the MBSP and RCP, that future co-investment programs provide greater flexibility for telecommunication providers to deliver improved connectivity to regional communities given the economic challenges of delivering regional connectivity – these include the enhancements recommended in section 7.4 of the submission.

7.5. Increased opportunities for commercially negotiated infrastructure sharing between mobile network operators

Telstra expects that there will be increased optionality for mobile network operators in deciding how to upgrade and expand their networks in the most efficient and competitive means available. This includes increased opportunities to negotiate infrastructure sharing between mobile network operators (**MNO**), driven by:

- Increased cost of capital investment of deploying 5G networks. Over the last 20 years, MNOs
 have been engaged in 'serial network deployment' as they have built and upgraded their networks
 for 2.5G, 3G, 4G and now 5G networks. There is an increased commercial imperative to defray
 costs, including through potential modes of 'sharing' networks;
- The challenges of scale as mobile network push further into lower populated areas in regional and rural Australia;
- The increasing options for sharing of infrastructure in the network stack made technically feasible by vendor innovations and enabled by global standards; and
- Changes in the market structure at the passive infrastructure level with the intensifying competition between specialised, non-vertically integrated tower companies, including Amplitel, Axicom and Optus' forthcoming divestiture of another tranche of its tower portfolio.

RAN sharing

RAN sharing is one form of infrastructure sharing that, in simple terms, involves the sharing of radio access network equipment. RAN sharing can realise a number of efficiencies including, depending on the specific circumstances of the network operator and the structure adopted:

- Decrease in duplication of investment and more efficient deployment of capital.
- Potential improved quality of service.
- Product and technological innovation by permitting operators to compete on service innovation and technology.
- Increased consumer choice as entry and expansion becomes easier and speedier through network sharing.

However, mandating RAN sharing would be unnecessary, unworkable and ultimately counterproductive for effective mobile competition in regional and rural Australia, for the following reasons.

First, in every overseas market in which RAN sharing has been deployed, it has been commercially negotiated between mobile operators. Figure 8 illustrates the European markets in which RAN sharing has been agreed between operators:





Source: Company information, European Commission, Belgian Competition Authority (BCA), BEREC, Arthur D. Little

Figure 8. Active network-sharing arrangements in Europe²¹

In addition, RAN sharing has been agreed between mobile operators in Canada, India and the US.

Second, there is no single form of RAN sharing or one-size-fits all model for RAN sharing. For example, there can be a common RAN connected to separate Home Location Registers (**HLRs**),²² a common RAN connected to different core networks (MOCN) or a common RAN access node with the spectrum logically split into independent spectrum (MORAN). As Figure 8 shows, some EU operators have implemented RAN sharing in the form of MOCN while others have decided on MORAN.

Decisions about the form of RAN sharing which is appropriate between two or more mobile operators are not feasibly made by policy makers or regulators. This decision will depend on the specific strategic, commercial and technical drivers of each of these mobile network operators and their decisions about how to optimise the various parts of the infrastructure to service customers. Mandating RAN sharing would require the regulator to be deeply involved in choices about network design and the commercial and competitive structure between the RAN sharing MNOs on an ongoing basis.

Third, mandating RAN sharing would undermine the value that it could deliver to achieving better coverage and investment. Active infrastructure sharing requires the mobile operators to agree to align network design, vendor equipment and pooled spectrum. The participating mobile network operators need to work together to effectively manage the complexity of handover between the active shared network and the neighbouring base stations of each network to avoid call drop out and diminished service levels. Introducing vendor equipment not already present in each mobile operator's network stack can result in a loss of customer service features and functions as they 'swap' between their home network and the shared RAN network.

²¹ Source: Network sharing in the 5G era | Arthur D Little (adlittle.com)

²² A HLR is a database for mobile subscriber management, and contains customer data including location, service entitlements and call-routing information. In combination with the International Mobile Subscriber Identity (IMSI), an HLR provides the network mechanism for both the cell-to-cell handover of calls and for local and international roaming.



Therefore, the strategic and commercial feasibility of RAN sharing between any two mobile operators will be determined by the level of pre-existing vendor and network alignment before active sharing and the costs of achieving the higher level of alignment needed to ensure RAN sharing works to the benefit of the participating mobile operators and customers.

Given each operator has different network design considerations, spectrum holdings (including nonadjacent frequencies) and vendor relationships, any mandated RAN sharing must necessarily default to accommodating the lowest common denominator of preferred network design. Competition in active RAN sharing areas, and potentially more widely through each mobile network, will lose the benefit of service and product innovation which 5G otherwise can bring to market. The need to find this baseline for mandating RAN sharing is likely to value-destructive for end users – such as 5G network slicing.

Preserving conditions for efficient mobile network infrastructure deployment

RAN sharing should be seen as expanding the range of strategic and commercial options for infrastructure sharing available to each MNO. Commercial negotiations allow for a richer and more flexible ability for network operators to organise their infrastructure models and deliver specific value for bespoke networks; while sufficiently preserving the ability to dynamically adjust this model over time as technologies change.

There is a role for regulation in 'anchoring' the range of infrastructure options with an effective regulatory regime for tower and site sharing between mobile network operators. Flexible negotiated RAN sharing arrangements together with passive infrastructure sharing (with the emergence of the specialist tower companies) is likely to drive the most efficient outcome. Passive infrastructure sharing ensures that there is a baseline alternative both for the party seeking commercial forms of infrastructure sharing or mobile wholesale services and the MNO which has been commercially approached to provide the service - while negotiated RAN sharing will preserve the ability to dynamically negotiate active sharing of the network arrangements that meet the technology and user demands at any particular point in time.

Recommendations

- 7. Greater coordination That Commonwealth Government funding and support be directed toward greater coordination between Governments at all levels, local communities and telecommunications providers to enable the development of plans for enhancing connectivity for local communities based on the specific geographic and social needs of those communities, including to support community resilience during natural disasters. For example, local planning initiatives which would improve connectivity but are prevented from progressing because local planning permission cannot be obtained.
- 8. **Infrastructure sharing** while Telstra does not support mandated roaming because of the impact on innovation and investment incentives, policies and programs which enhance the opportunity for passive telecommunications infrastructure sharing should be encouraged.

8. Response to RTIRC 2021 Issues Paper Questions

Question 1: What telecommunications services are required in regional Australia to meet current and future needs? Are there any things regional communities and businesses need to do, but can't, on their existing services?

To meet current and future needs, regional Australia requires:

 access to affordable fixed and/or mobile networks which allow customers to realise opportunities from the digital economy, while also supporting their education and social needs;



- access to affordable products and services that allow them to be secure and maximise the benefits from being online; and
- the ability to know what to buy to best meet their needs and how to use the products and services.

There is no doubt many things that regional communities and businesses need or want to do but can't with their existing services. We have seen an increase in demand for data and online services during the pandemic, which is summarised in our response to Question 6.

Section 6 of our submission outlines the technology horizon that will support improved telecommunication services for regional Australia. To achieve this horizon we need to ensure a technology agnostic approach is taken to the delivery of telecommunication services to regional and remote Australia, as summarised in section 7.

Question 2: What changes in demand, barriers or challenges need to be addressed when it comes to telecommunications services in regional, rural and remote Australia?

Similar to the national trends, demand for telecommunications services in regional, rural and remote Australia has increased exponentially. This is illustrated in section 3.2 with the demand for data on the mobile network. This will continue to increase as communities digitise and as consumers continue to increasingly rely on telecommunications services to perform many functions of everyday life.

As outlined in section 7, the scale of the Australian landmass and concentration of our population make the cost of investing, delivering and maintaining services in large parts of Australia commercially unviable. nbn co uses fibre-based technologies to meet its objective in built up areas, and fixed wireless and satellite in regional Australia. In terms of mobile coverage, these factors mean it is not feasible to expect all of Australia will receive mobile coverage.

This is why the different Government programs have been so important in supporting providers, like Telstra, to expand coverage into more remote areas. The increase in demand and economic realities are factors that will not change and will determine the level of investment in regional Australia. The challenge is to revise Government policy to ensure that policy and regulatory settings provide incentives for investment in, and use of, the telecommunications services required by regional communities. This is also discussed in our response to Question 3.

Question 3: How have the Government's policies and programs affected telecommunications service outcomes in regional, rural and remote Australia? How can these be improved?

The Government's USG provides for the efficient and ubiquitous delivery of high-quality voice and broadband services for all Australians, no matter where they live or work. This is a commitment to regional, rural and remote communities that we fully support and have a central role in delivering. For the USG to be fully realised and remain relevant far into the future it must be technology-agnostic, so that customers are not tied to a single technology that will inevitably age and become less relevant over time.

The greatest barrier to achieving a technology-agnostic USG is the current requirement for Telstra to use the old copper network to deliver telephone services in most cases outside the nbn fixed line footprint. This copper has served us well for many decades but is no longer fit for purpose. There are already a range of technologies that provide better-performing, more resilient telephone services than is possible over copper, including fixed wireless, and there are more that will be available in the near future including low latency, Low Earth Orbit satellite services.

We understand the desire for regional communities to have access to new technologies and to expand their range of communications options, but it will be much more difficult to deliver on this desire if we are required by Government policy to continue investing in maintaining the ageing copper network. This requirement is holding back the development and large-scale rollout of new technologies. The resiliency and redundancy concerns that have generated support for copper in the past are now squarely addressed by the expanding range of distinct networks becoming available in increasingly remote areas. If one network fails, there will be others to maintain connectivity.



The Government recognises the importance of alternative communication technologies to the future of regional Australia by funding the Alternative Voice Services Trial. Under this program we have deployed 4G fixed wireless and low-impact USO satellite telephone services and are also partnering with nbn co to trial its fixed wireless and satellite solutions. We are confident this trial will illustrate the strength of these alternatives to copper and rightly increase confidence in them as an alternative, not an addition, to traditional copper landlines. Although we recognise that more work will need to be done by the Government and USG providers (Telstra and nbn co) to provide the confidence and possibly the incentives for consumers to move away from the copper network and onto alternative technologies.

Co-investment programs such as MBSP and RCP have been significant for enabling the provision of new mobile coverage to regional and rural areas that are not economically viable for mobile network operators to invest in. We have been a strong supporter of Government co-investment programs, making significant contributions to the MBSP and RCP among other initiatives. Section 7.4 outlines some identified areas of potential change to the MBSP, so the connectivity experiences of people in regional areas continue to improve.

Question 4: How do service reliability issues impact on regional communities and businesses? How do outages, including in natural disasters, impact on communities and businesses?

We recognise that regional communities and businesses are dependent on connectivity for their work, education and to stay socially connected. With the ever-increasing reliance on connectivity to support e-commerce, e-learning and connecting with people the demand on telecommunications continues to grow. This is demonstrated in section 3.2 where we outline the demand over the past three years for data alone.

The importance of resiliency is addressed throughout our submission. In order to increase the resilience of telecommunications networks, we need to address the potential for, and impact of, power outages. We have also made comments about EFTPOS resiliency (see section 3.3), the importance of cyber security (see section 5.4) and consideration of the design of apps (see section 3.2).

As we have outlined in section 6, emerging technologies will be part of this solution as we look to migrate regional and remote customers off older networks. This will require the right investment and policy settings to enable this change, as we outline in section 7.

Question 5: How might such impacts be addressed to ensure greater reliability? How can the network resilience be addressed in regional areas?

Sections 3.3 and 3.4 of our submission provides our suggestions on how to better enhance network resiliency and reliability. In relation to natural disasters, we outline how we manage outages in section 4 of the submission.

Question 6: How did the use of digital services change for regional consumers and businesses during the response to the COVID-19 pandemic? What insights for future service delivery does this provide?

As depicted in Figure 2 above (section 3.2), there has been significant ongoing growth in the volume of download traffic in regional and remote areas in recent years, and the COVID-19 pandemic — which saw more people working, and undertaking educational activities, from home — has been a contributor to this trend. The general insight for service delivery is that digitisation is of increasing importance to all Australian's, with digital inclusion requiring a strong focus on ensuring people can access and use technology so they can beneficially participate in the digital economy. As discussed in the main part of our submission, and in response to question 8 below, there are opportunities to better coordinate and align government policies to support greater participation in the digital economy.

Question 7: What can be done to improve the access and affordability of telecommunications services in regional, rural and remote Indigenous communities?



Section 3.5 of this submission provides our suggestions on how access, affordability and digital ability could be improved in regional, rural and remote Indigenous communities.

We have also established a First Nations Connect team. This dedicated Darwin-based hub is staffed by people who are regionally based and of Indigenous descent. This team has been established to support our Indigenous customers and we're also anticipating that some of these calls will be taken and solved in-language for our Indigenous customers.

Question 8: How can investment in telecommunications infrastructure work with other programs and policies to encourage economic development in regional Australia?

The digital economy has the potential to lift investment, productivity, employment, wages, and overall quality of life for Australians and the Commonwealth Government has quite rightly committed to making Australia a leading digital economy by 2030.²³ This is also summarised in section 5 of our submission.

The need for better co-ordination and alignment in policies is relevant now as we see an increasing move toward growth in population and investment in regional Australia. Recent evidence released in September by the Regional Australia Institute and the Commonwealth Bank, through their Regional Movers Index, demonstrates there was an 11 per cent rise in the number of people moving from capital cities to regional cities in the June 2021 quarter when compared to the corresponding quarter in 2020.²⁴

As outlined by the NFF in February, better coordination of priorities between Commonwealth and state Governments, including taking a long-term approach to assessing infrastructure investment, will also be important to ensuring effective support for regional development.²⁵

As we have articulated in this submission, taking a technology-agnostic approach to the policy settings and investment decisions when it comes to telecommunications infrastructure will support regional Australia and give the most advanced solutions to meet their technology needs.

Question 9: What role could innovation, including new models, alternative investors or new ways of doing business, play to encourage investment in regional telecommunications infrastructure? What are the barriers?

There are a number of key policy settings which could be revised to encourage innovation and infrastructure investment, including:

- the terms of the Government's co-investment programs, including better co-ordination for approvals, as outlined in section 7.4;
- the full implementation of Cell Broadcast emergency notifications to support information sharing during emergencies as outlined in section 4.5; and
- reform of the USG towards technology agnostic obligations focused on the outcomes to be delivered rather than the technology by which they are delivered, which is covered in section 7.3.

In addition, increased opportunities for commercially negotiated infrastructure sharing between mobile network operators is covered in section 7.5 of our submission.

Question 10: To what extent will new technologies enable significant change to the delivery of telecommunications services in regional Australia over the next 5-10 years? Are there any barriers to accessing these technologies?

²³ Source: https://digitaleconomy.pmc.gov.au/

²⁴ Regional Australia Institute (2021), *Regional Movers Index*. June 2021 Quarter, released 17 September. Source: www.regionalaustralia.org.au/home/regional-movers-index/

²⁵ NFF's Regionalisation Agenda, released February 2021. Source: www. nff.org.au/regionalisation-agenda/



We believe new technologies will deliver significant change in the telecommunications services available to regional Australians, as summarised in section 6.

The key barrier to accessing these technologies in regional Australia is investment given that it is simply not economic to make the investments required to deliver these services in large parts of regional Australia. Government supported co-investment programs and USG policy settings are critical to address these investment barriers. Refer to section 7.3 of this submission for our response to this question and our response to Questions 3 and 9.

Other potential barriers, such as affordability and ability (including awareness), can be readily addressed with programs structured toward providing education and support for customers, so they are informed about how technology is altering service provision, and how they too can use technology is this is their preference. This is covered in more detail in section 3.5.

Question 11: How can Government better support the rapid rollout of and investment in new telecommunications solutions in regional areas?

Refer to section 7 of this submission for our response to this question and our response to Questions 3, 9 and 10.

Question 12: How can different levels of Government, the telecommunications industry and regional communities better co-ordinate their efforts to improve telecommunications in regional Australia?

We have experienced the challenges of the fragmented and inconsistent approach to state and territory digital infrastructure planning, which is undermining the potential economic and social impact of digitisation. It is manifesting in a duplication of infrastructure, which in turn can reduce the economics of private sector investment, failing to leverage the more material Commonwealth Government telecommunications funding, particularly in relation to co-investment programs. This compounds the situation by making it difficult to evaluate the effectiveness of existing programs.

As our understanding of digital inclusion opportunities and challenges continues to increase, improved regional planning across governments and industry would enable initiatives to be better targeted, scaled and evaluated. For example, city deals and other smart city initiatives provide positive opportunities to leverage the industry's substantial investment in 5G and other asset management capabilities to improve the planning, construction, maintenance and security of smart infrastructure.

Question 13: What changes to Government investment programs are required to ensure they continue to be effective in delivering improved telecommunications?

Section 7.4 outlines the key changes which we believe need to be made to the MBSP and the regional connectivity solutions provided through RCP. We also recommend the Government make additional investments to continue the roll-out of the STAND program, as outlined in section 4.

Question 14: How can regional consumers be better supported to identify, choose and use the best connectivity options for their circumstances, as well as to understand and use their consumer rights?

Sections 3.5 and 3.6 outline the investments made by Telstra and the ways in which the Government and communities could act to help regional consumers better identify, choose and use the best connectivity options for their circumstances and understand and use their consumer rights.

Question 15: To what extent is public information on connectivity options, including predictive coverage data and speeds, sufficient to help regional customers make informed decisions? What other information is needed?



As the Issues Paper outlines, mobile network operators have adopted consistent terminology around coverage information. However, we note your interest in understanding the extent to which technical differences in predictive coverage mapping still persists.

It is important to note when considering predictive maps that definitive accuracy is not possible. Wireless technologies, such as mobile, is inherently variable and accurate modelling of indoor coverage can be challenging and uncertain as there are significant and highly variable signal losses incurred due to local building density and the building materials used (for example steel framing or metallic window tints can block signal) as well as local geography/topography, vegetation growth and the devices being used by customers.

Mobile technologies are far more variable than other technologies. The current mapping used is sophisticated and detailed, and it is designed to provide the best indication that can be made, however it isn't possible to account for all these variances in a coverage map as they take place at a very local level and change over time. We provide guidance on how the published maps are created and the factors affecting coverage experience on the "View coverage details" link in the map legend on our coverage map page.

In addition, in response to the 2018 RTIRC, who found there was a significant market for a simple platform aimed towards regional Australians to help them navigate digital technologies, the Commonwealth Government committed funding toward the establishment of a Regional Tech Hub. NFF, in collaboration with the Australian Communications Consumer Action Network (**ACCAN**), were awarded the contract to deliver this service. The Regional Tech Hub offers independent advice and support and helps regional Australians negotiate often confusing phone and internet options and technical issues.²⁶ We have provided input to support their content development and also an escalation pathway for customer related issues.

Question 16: What other matters should the Committee consider in its review and why are they important?

We believe all relevant matters have been covered in our submission.

²⁶ Source: https://regionaltechhub.org.au/



