TELSTRA CORPORATION LIMITED

Response to the Productivity Commission Transitioning Regional Economies Study Terms of Reference

15 February 2017

CONTENTS

EXECUTIVE SUMMARY

Good telecommunications infrastructure and services are fundamental to regional economies having the opportunity to transition successfully from the resources boom to a more diverse and sustainable economy. This submission quantifies Telstra's presence in regional communities, provides evidence of the importance of telecommunications to social and economic activity, and explains why changing the current regulatory settings to mandate inter-carrier roaming would discourage further investment in regional mobile telecommunications infrastructure.

Telstra is deeply integrated into regional communities

The economic decline of the resources sector will have the greatest effect on permanent communities that have historically relied on resources operations to drive their economies (as opposed to remote operations with no permanent community). Permanent communities tend to be in regional rather than remote areas, and are therefore more likely to have telecommunications infrastructure in place.

As at January 2017, Telstra has 181 stores and employs 3,348 staff and 6,011 contractors in regional areas. We maintain 2,839 exchanges for the provision of fixed telephony and ADSL broadband services, and run approximately 3,655 mobile facilities (including towers and masts), in Outer Regional, Remote and Very Remote Australia.

Telstra is more than just a prominent provider of telecommunications infrastructure and services in regional areas. We have been a global leader in the development of industry standards and technical innovation geared specifically to the needs of regional and rural customers, particularly for mobile.

Telecommunications helps underpin economic activity

Several recent government-funded reports have highlighted the social and economic importance of good telecommunications to regional Australia, including reports from the Regional Telecommunications Independent Review Committee (RTIRC), the Productivity Commission, the Australian Communications Consumer Action Network (ACCAN) and the Australian Communications and Media Authority (ACMA).

Deloitte Access Economics has quantified the workforce productivity and participation benefits of mobile access at $42.9 billion in 2015, including the benefits arising from people being able to work remotely. The NBN has published social research identifying 'e-change' migrations in which people move to 'life-style' towns within 150km of major centres, facilitated in part by connectivity and teleworking.

Beyond workforce participation enabled by remote working, regional broadband offers a host of current and future benefits that will help underpin sustained economic activity in regional Australia. These include precision agriculture, telemedicine, remote education, better disaster management, better water management, and more efficient energy generation, distribution, storage and use.

However, despite generally good (and constantly improving) access to telecommunications technology in regional areas, regional consumers currently lag behind urban consumers in their adoption and use of broadband, as identified in the Digital Inclusion Index Report 2016. Policies that address adoption and usage of broadband in regional areas should support regional economic resilience.

Continued investment in mobile technology and coverage is vital

Mobile broadband technology and coverage is equally if not more important than fixed broadband to regional Australia. Fortunately, strong infrastructure-based competition has driven continued investment that has helped deliver constantly expanding networks. Over the last 10 years, Telstra has spent 15 per cent of our mobile investment to bring mobile services to the most remote two per cent of the population.

Australia's mobile network reach, technology and service prices are world class, despite our dispersed population and challenging geography. This outcome results from the current regulatory settings that encourage all mobile operators to compete vigorously not just on how services are priced and marketed, but on infrastructure-based qualities including coverage, technology, speed, reliability and security.

This infrastructure-based competition, including competition between operators on geographic coverage, has driven the constant increases in Telstra's 3G and 4G mobile coverage over the last decade and contributes strongly to our leadership in both coverage and market share. This directly benefits regional, rural and remote customers who would not otherwise be able to enjoy these services.

01 Telstra is deeply integrated into regional communities

We believe the economic decline of the resources sector will have the greatest effect on permanent communities that have historically relied on nearby resources operations to drive their economies (as opposed to remote operations with no permanent community). Permanent communities tend to be in regional rather than remote areas, and are therefore more likely to have telecommunications infrastructure in place.

1.1. Telstra's presence in regional Australia

Telstra has been a constant presence in regional communities since telephone services were first installed. As at January 2017, we have 181 stores in regional areas, and employ 3,348 staff and 6,011 contractors. We maintain 2,839 exchanges for the provision of fixed telephony and ADSL broadband services, and run approximately 3,655 mobile facilities (including towers and masts), in Outer Regional, Remote and Very Remote Australia.[1]

1.2. Telstra has delivered over decades for regional customers

Telstra is more than just a prominent provider of telecommunications infrastructure and services in regional areas. We have been a global leader in the development of industry standards and technical innovation geared specifically to the needs of regional and rural customers, particularly for mobile. We have:

- led investment in and adoption of new mobile technologies in regional Australia over the past three decades, originally starting with analogue and progressing to the latest 4G technologies;
- led regional and global alignment of the 850 MHz and 700 MHz frequencies for 3G and 4G mobile use, ensuring better service over longer distances;
- pioneered technical solutions to improve mobile coverage and received experience including designing and advocating changes to international standards to enable Telstra to operate cell sites with longer range, introducing the smart antenna product (an authorised mobile repeater device) to improve performance at premises in fringe coverage areas, and the blue tick standard; and
- been at the forefront of the development of Narrow Band Internet of Things technology for mobile networks, with huge potential for driving efficiency in regional and rural enterprise.

In addition to these innovations, we have brought services into remote areas in partnership with remote communities. For example the delivery of new fibre to Birdsville, Burketown and Aurukun and mobile services to remote Northern Territory communities.

[1] Store and employee numbers accord with a Telstra internal definition of 'regional' based on post code classifications. The number of exchanges and mobile facilities is based on the ABS remoteness area definitions.

1.3. The flow-on benefits of mine-site specific telecommunications infrastructure

Resources operations can attract telecommunications infrastructure that benefits surrounding communities long after a mine is depleted. Telstra has partnered with resource extraction companies to install telecommunications infrastructure to amplify these benefits – see Case Study 1.

Case Study 1 – Chevron Australia Wheatstone Project

In 2015 Telstra signed an agreement with Chevron Australia to install submarine fibre optic cable connecting Onslow, the Barrow Island Jetty, Gnoorea Point and the Wheatstone Gas Platform in Western Australia. As part of this agreement we committed to deliver a community digital capability program in the Onslow region to improve digital literacy and address barriers to digital inclusion. An immediate opportunity identified for Onslow in consultation with the Bindi Bindi Indigenous community was to re-establish Wi-Fi connectivity in the community. As a result, new Wi-Fi infrastructure has been installed in Bindi and was made live on 17 November 2016. The service will be free for Bindi Bindi residents until 30 June 2018 at which time transitional arrangements will be considered.

In consultation with the community, Telstra also provided a full technology solution (configuration & installation) for the new Youth & Community Centre run by V-Swans. Without Telstra's help V-Swans would not have been able to create a world class learning environment and deliver the practical technology based outcomes so desperately needed in Onslow.

Access to appropriate infrastructure is only one of the barriers to digital inclusion. As such, Telstra is now working on a digital skills program to leverage the Wi-Fi and youth centre infrastructure and investment so that residents can reap the benefits of modern technology.

We have also seen ad hoc community benefits from our partnerships with resource companies. For example, when BHP mobilised their significant resources at Olympic Dam to help keep the local telephone exchange running during South Australia's major power outage in November 2016.

02 Telecommunications helps underpin economic activity

Numerous recent inquiries and reports have highlighted the social and economic importance of good telecommunications to regional Australia. Policies are needed which incentivise further investment in regional telecommunications networks and address the digital divide between urban and regional areas.

2.1. The social and economic importance of telecommunications to regional Australia

2.1.1. Regional Telecommunications Reviews

The Regional Telecommunications Independent Review Committee's (RTIRC's) 2015 report found that regional communities are more dependent on telecommunications than urban communities due to their geographic circumstances, which means they spend longer in transit, rely more on e-commerce services, are more likely to run businesses from home, and depend more on reliable emergency services. They are also more likely to use mobile telecommunications than their urban counterparts.[2]

Similarly, the RTIRC's 2011-12 report found that "*mobile communication is considered essential for people to run businesses, work in remote areas, to encourage tourism and growth, and to have reliable communications in emergency situations.*" It also found that "*for businesses, mobile phones are an important tool to conduct commercial transactions and communicate with clients and employees*", so that poor mobile service meant loss of business.[3]

2.1.2. Productivity Commission Inquiry into the Universal Service Obligation

Many submissions to the PC's inquiry gave evidence of the social and economic importance of telecommunications to regional, rural and remote communities. For example:

- the Isolated Children's Parents' Association (Western Division) submitted that "*residents in rural and remote areas often have no regular face-to-face access to services, and rely on telephone and data services for health, education, business and lifestyle.*"[4];
- the Tennant Creek Regional Economic Development Committee highlighted the need for mobile phone coverage "*from an Emergency Services and OHS perspective*" and the importance of public phone boxes which "*have been the life blood of communities, and still are … especially in the long term/seasonal/semi-permanent communities.*"[5];
- the Broadband for the Bush Alliance argued the economic and health benefits of telecommunications through the example of a recent pilot study into "*the benefits of telehealth in Katherine, Tennant Creek and Alice Springs … [which] found estimated savings in the order*

[2] Australian Government, *Regional Telecommunications Review 2015*, p.13.
[3] Australian Government, *Regional Telecommunications Review 20111-12*, p.41.
[4] Western Downs ICPA, *Submission to Productivity Commission Inquiry into the Telecommunications Universal Service Obligation*, p.1.
[5] Tenant Creek Regional Economic Development Committee, *Submission to Productivity Commission Inquiry into the Telecommunications Universal Service Obligation*, p.1.

of $1.2m over the duration of the 15 month study simply through the reduction of travel and associated costs for patients and escorts"[6]; and

- the Country Women's Association NSW noted that "*a lack of connectivity, particularly mobile coverage and data services, results in barriers to growth for our farmers and small business operators as well as barriers to a quality education for our students; and barriers to health services for our entire community."*[7]

2.1.3. Evidence from the Australian Communications Consumer Action Network

In representing the views of its members to the Australian Competition and Consumer Commission (ACCC) on the issue of regulated mobile roaming, the ACCAN argued that "*mobile services are critical to people who live, work and travel in or through regional and remote areas on a daily or frequent basis … Access to the internet is also essential for consumers to run their businesses, access critical services such as online banking and government services and enjoy the many other benefits that the internet offers"*[8]

As agriculture takes up some of the slack left by the decline in resources operations, ACCAN finds that "*there is a growing appetite for data for commercial needs, in particular across the agricultural sector where technology is used to track and report farming operations and in markets for livestock and equipment*", and that in the town of Forbes, for example, "*congestion is particularly bad on cattle sale days. The lack of a reliable connection impacts on buyers and sellers being able to access real-time prices and contact livestock processors, clients and agents.*"[9]

2.1.4. Evidence from the Australian Communications and Media Association

Research conducted for the ACMA in 2013 estimated that mobile broadband services increased the growth rate of the Australian economy by 0.28 per cent per year over the period from 2007 to 2013 which equates to an increase in Australia's economic activity of $33.8 billion in 2013. Put another way, Australia's total GDP would have been 2.28 per cent lower without mobile broadband.[10] Of this $33.8 billion, only $7.3 billion reflects the impact of productivity growth within the mobile communications sector. The bulk of the efficiency gains – $26.5 billion – are from time savings for businesses as a result of using mobile broadband services.

2.2. Education, workforce participation and regional population growth

2.2.1. Improving education through telecommunications

Improving educational opportunities for regional communities impacted by the decline of the resources sector is an essential part of helping them successfully manage the economic transition. Opportunities for both students and teachers to change how and where education is delivered are already being

[6] Broadband for the Bush Alliance, *Submission to Productivity Commission Inquiry into the Telecommunications Universal Service Obligation*, p.4.
[7] Country Women's Association of NSW, *Submission to Productivity Commission Inquiry into the Telecommunications Universal Service Obligation*, p.1.
[8] ACCAN, *Submission to ACCC inquiry into whether to regulate a wholesale mobile roaming service*, p. 6.
[9] ACCAN, *Submission to ACCC inquiry into whether to regulate a wholesale mobile roaming service*, p. 20.
[10] The Centre for International Economics, Research prepared for the ACMA, *The economic impacts of mobile broadband on the Australian economy, from 2006 to 2013,* April 2014, p 4.

embraced by regional Australian communities. Since today's technologies (smartphones, video conferencing, online exam verification and identification, remote lectures, virtual reality devices) mean that learners can access high-quality experiences when they choose and get a credential for it, alternatives to the traditional approach of centralised, location-based learning are already emerging.

These advances will continue to bring regional communities better access to resources, wider choice of educational opportunities and more reliable connections to friends, communities of interest and potential employers.

2.2.2. The contribution of mobile to workforce participation

In a report prepared for the Australian Mobile Telecommunications Association, Deloitte Access Economics looks at the impact of mobile services on labour productivity growth and workforce participation. On the latter, it finds that:

> *The flexibility facilitated by mobile is very important to labour force participation. Of those who are currently employed, nearly 15% would work fewer hours if they could not work remotely using mobile technologies, and 11% would work fewer hours if they could not meet personal commitments while at work. In total, it is estimated that those surveyed would work on average 0.6 hours less per week if they did not have access to mobile devices. This means that the economy is $8.9 billion larger in 2015 than it would otherwise be as a result of mobile-enabled labour force participation. This additional GDP supported approximately 65,000 full-time equivalent jobs – about 1% of total employment.*

The report separately estimates the long term productivity benefits of mobile technology to the Australian economy to be 2.0 per cent of GDP, or $34 billion, in 2015. Overall, therefore, the cumulative impact of mobile on the economy is estimated to be $42.9 billion in 2015, or 2.6 per cent of GDP.[11]

2.2.3. Contribution of broadband access to regional population growth

NBN published research in 2016 on the rise of the 'e-change' movement in which people move from the major urban centres to regional locations to improve their lifestyle, facilitated largely by ubiquitous broadband access allowing telecommuting. The research finds there are potentially 600 'lifestyle towns' across Australia which offer 'commutable access to the job market of a capital city' within 150 km. It estimates that by 2026 there could be 1 million Australians working from home, or 8 per cent of the workforce. [12]

Using information provided by NSW Mining, it appears that the following coal mining sites fall roughly within NBN Co's definition of a potential lifestyle town: Muswellbrook, Singleton, Denman, Gloucester, Stroud, East Maitland, Newcastle, Cessnock, Southampton, Killingworth, Lake Macquarie, Wyong, Kandos and Lithgow.[13] While these towns may not be economically dependent on mining, there may be the potential for 'e-changers' to diversify local economies and replace the economic activity lost to the resources slow-down.

2.3. The potential of telecommunications to underpin new regional and rural technologies

[11] Deloitte Access Economics, *Mobile nation: Driving workforce participation and productivity*, 2016, pp.i-ii.
[12] National Broadband Network, *Super connected lifestyle locations: the rise of the e-change movement*, 2016.
[13] http://www.nswmining.com.au/industry/mines-in-nsw

As high-speed fixed and wireless broadband services continue to evolve, the ability to combine mobility with 'smart' networks and cloud computing will enhance existing regional connectivity. This means a whole new range of applications that were previously either too expensive or technically complex will become a reality.

The next generation of mobile technology, 5G, will power more than just high-speed smartphones. New capabilities include much greater capacity for more devices on the network, lower latency of signals which will help support autonomous vehicles and other machines, and far lower energy requirements that will enable battery life significantly longer than what we see today – all critical elements in the growth of the Internet of Things (IoT).

Telstra is adding new capability to 4G, such as Narrow Band IoT to support these features, and 5G is being designed from the outset to incorporate these types of applications. Industries in Australia that will benefit from the additional capabilities of 5G include transport, emergency services, and process industries such as mining, agriculture, and land and water management.

The Internet of Things in agriculture

The Internet of Things refers to objects (everything from cars, houses and public infrastructure) which are connected to one another through a network. The number of objects being connected is expected to reach a staggering 21 billion devices by 2020. IoT is already having an impact on regional Australia with the 4G network, and this will be bolstered by the introduction of 5G.

The data collected through IoT will help farmers make smart decisions to increase the productivity of their enterprise and reduce the impact of events which can adversely impact profits and livelihoods. Integrating sensors with rapidly evolving abilities to analyse data will create a technical revolution that will change the way farms are managed.

For example, sensors attached to water tanks allow a real time view of water levels. When connected to on-farm networks this technology can proactively alert farmers of threshold events such as water levels dropping below 20 per cent, or a tank level dropping more than 10 per cent. So when livestock on a remote part of a property damage a water line causing leakage, a farmer will know before the situation is too late to fix.

Sensors embedded in soil can track moisture and soil health, making it easier for farmers to efficiently distribute water and fertilisers. This data can be integrated with farm scheduling activities, increasing quality and yield and allowing timely procurement of consumables and labour.

Just like Smart Pills that are being developed for people, ingestible sensors designed to monitor livestock health are advancing at great pace. By bringing these sensors into the Internet of Things, rumination across an entire herd of cattle, health of prized breeding stock and fertility across a range of breeds can be monitored and tracked in real time.

Farms blanketed with sensors that are connected via IoT are able to monitor and track machinery, allowing for proactive maintenance scheduling. Machinery will increasingly accommodate autonomous guidance for precision planting and other cropping activities, with performance data

being aggregated at the homestead or office via a farm-wide dashboard that provides an integrated view of not only livestock and crop health but business health and profitability as well.

2.4. The importance of addressing the digital divide

2.4.1. Addressing the digital skills divide

Telstra's and Swinburne University's Australian Digital Inclusion Index 2016 reveals a significant disparity between the digital behaviours and capabilities of regional vs urban consumers. This 'digital divide' must be addressed if the promise of developments in telecommunications technology and infrastructure is to be fully realised for regional communities and economies.

The *Measuring Australia's Digital Divide* report finds, *inter alia*, that:

- digital inclusion is about social and economic participation, based on the premise that everyone should be able to make full use of digital technologies to manage their health and wellbeing, access education and services, organise their finances and connect with family, friends and the world beyond;

- digital ability is an area for further improvement, meaning that all across Australia the recent improvements in the three contributing Index metrics of Attitudes and Confidence, Basic Skills and Activities are not enough to allay concerns that Australians are not getting the most from digital technologies, not least because the improvements have been from such a low base; and

- geography plays a critical role in that there are significant differences across metrics between rural and urban areas, largely due to differences between the digital ability and affordability of services (whereas the gap between urban and rural access to services is narrowing). Regional and local initiatives are needed to address the geographic digital divide.[14]

2.4.2. Addressing the digital infrastructure divide

The geographic digital divide and its impact on regional economic development is the subject of a 2009 study by Charles Sturt University and Regional Development Australia. The study finds that disparities in telecommunications infrastructure availability between urban and regional areas limits the potential benefits of digitisation for regional customers, including the diversification of economic and social opportunities, improved efficiencies for regional businesses, and the potential for population growth.[15]

The study goes on to examine a 2003-2008 collaboration between Telstra and the Riverina Regional Development Board that resulted in the establishment of infrastructure that would not otherwise have been built at that time (see Case Study 2 below). The study concludes that community-led

[14] Swinburne University and Telstra, *Measuring Australia's Digital Divide: The Australian Digital Inclusion Index 2016*.
[15] 'Telecommunications and regional development' in *Australasian Journal of Regional Studies*, Vol. 15, No 2, 2009.

telecommunications infrastructure development programs such as this may be necessary to support infrastructure development in areas with dispersed populations.

In 2016 Telstra announced a $100m-$200m co-investment fund for rural and remote mobile infrastructure to complement the Federal Government-led Mobile Black Spot Programme. Together these programs should build on the lessons from earlier, smaller attempts at overcoming the digital infrastructure divide to the benefit of regional economies and communities.

Case Study 2 – Riverina telecommunications infrastructure partnership

Beginning in 2003, Telstra Country Wide and the Riverina Regional Development Board (RRDB) joined forces to improve telecommunications infrastructure in the Riverina region of NSW. In summary, the partnership resulted in the establishment of a development fund that committed more than $250,000 to build four previously unbudgeted mobile base stations in addition to Telstra's planned investments in the region (at Ranking Springs, Marrar, Walla Walla and Holbrook).

A related fund set up by the RRDB focussed on training for small businesses in developing their own websites, helping them to become more efficient, and assisting them to expand their markets through online services.

03 Continued investment in mobile technology and coverage is vital

3.1. Telstra has invested heavily in our regional, rural and remote mobile network

Over the last six financial years, Telstra has invested over $8 billion on our mobile network and services (on a fully-allocated basis, including spectrum). This has created a 3G network that reaches 99.3 per cent of the population and a 4G network that reaches 98 per cent of the population today. We continue to invest in technology enhancements and capacity upgrades as part of an ongoing investment cycle to provide the broadest coverage and the best possible experience for customers.

Our investment in the mobile network is heavily weighted towards expanding coverage and delivering new technology to regional, rural and remote Australia. In addition, we have committed approximately $230 million to continue our work on the first two rounds of the Mobile Black Spot Programme, including 577 new mobile towers.

3.2. Regional mobile investment has been facilitated by well-balanced regulatory settings

Existing regulation in the Australian mobile market promotes competition and choice by giving competing network operators access to one-another's base stations for co-location of equipment, and access to data transmission links at regulated prices (which the ACCC recently reduced by 72 per cent in regional areas). The Australian Communications and Media Authority also places limits on the amount of spectrum any mobile network operator can purchase.

This form of competition has led to much greater mobile network coverage for regional and rural customers. As the ACCC wrote recently: "Competition in the retail mobile market has benefited many consumers living in regional Australia. As MNOs compete on the basis of network coverage, competition in the retail mobile market has helped to extend mobile coverage in Australia. Being able to offer customers the largest mobile network is Telstra's point of difference in a competitive market."[16]

3.3. The future of investment in mobile coverage and technology is in doubt

The ACCC is currently conducting an inquiry into whether inter-operator mobile roaming should be regulated so operators can use each other's network to provide mobile services to their customers.[17] If the ACCC decides to impose regulated roaming it will put any future investment in mobile coverage extension (from any operator) in doubt, because it would destroy the coverage competition that has delivered world class mobile coverage in Australia.[18]

A report from international consultants Ovum makes clear that "Telstra essentially absorbs the cost of the coverage it provides in the most remote areas (including many small communities and extensive highway coverage) to retain its leadership position."[19] Ovum show that Telstra's approach to regional investment is underpinned by urban customers who are willing to pay for broader coverage, and that Optus and Vodafone could viably expand their coverage to narrow the gap should they chose to invest. All customers who value coverage drive competitive network investment that increases coverage to the

[16] ACCC, *Competition in the Australian telecommunications sector*; February 2016.
[17] ACCC, *Domestic mobile roaming declaration inquiry Discussion Paper*, October 2016.
[18] Telstra, *Response to the ACCC's Discussion Paper on the declaration of a wholesale domestic mobile roaming service,* 2 December 2016.
[19] Ovum, *Mobile Network Investment and Domestic Roaming*, 2 December 2016.

benefit of regional, rural and remote customers. This is delivered at a national price point ensuring that regional customers enjoy the benefits of competition in metropolitan areas without facing the underlying cost of service provision. This facilitates the delivery of services at affordable price points.