Australian Government
Regional Telecommunications Review

2024 Regional Telecommunications Independent Review

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Table of Contents

Overview

A Regional Telecommunications Independent Review Committee (the Committee) is established every 3 years under Part 9B of the *Telecommunications (Consumer Protection and Service Standards) Act 1999* (TCPSS Act) to conduct a review into telecommunications services in regional, rural and remote parts of Australia.

The Committee for the 2024 Regional Telecommunications Review (the Review) was announced on 25 January 2024. The 2024 Committee is comprised of the Hon Alannah MacTiernan (Chair), Ms Kristy Sparrow, the Hon Fiona Nash, Dr Jessa Rogers, and Mr Ian Kelly.

As part of the Review, the Committee will consider:

- awareness and the impact of the Australian Government's $1.1 billion investment in improving regional communications (including the $656 million Better Connectivity Plan for Regional and Rural Australia), the extent to which this investment is addressing identified needs and flexibility to address emerging needs and challenges
- the implications of, and opportunities presented by, changing and emerging technologies and broader market developments regional communications policy settings and the design and delivery of regional communications programs
- attitudes of regional households, communities and businesses to: community awareness of, access to supporting technologies to support take-up of, and public sentiment on changing and emerging technologies
- needs in First Nations communities, and the extent to which those needs are being met, taking-into-account specific initiatives across government
- the potential to fast track some Universal Service Obligation (USO) modernisation outcomes, particularly within NBN's fixed wireless network footprint, which would build momentum for broader change
- the suitability of regional communications during emergencies and natural hazards, including reliability, resilience, speed and coverage.

The full Terms of Reference for the Review are at **Appendix B**.

The Committee invites individuals, regional community groups, businesses, industry and governments to engage directly with the Review over the coming months through face-to-face consultations, written submissions and online forums.

The Committee will report to the the Hon Michelle Rowland MP, Minister for Communications by 31 December 2024. The Committee may make recommendations to the Australian Government. Where it does so, it must consider the costs and benefits of any recommended action.

Further information about the 2024 Regional Telecommunications Review and the Committee is at www.rtirc.gov.au.

Have your say

This issues paper provides an outline of key areas of interest and invites submissions that share a range of experiences and perspectives.

The RTIRC Independent Committee welcomes feedback from the Australian community. To provide feedback, you can complete the survey and/or provide a submission. Responses are welcome from individuals, businesses, peak bodies and other interested organisations. There are questions in this paper to provide guidance for framing submissions. You can address all the questions or just those that are relevant to you. However, submissions are not limited to the questions provided, and the Committee encourages responses to address other issues and possible solutions beyond what is presented.

Written submissions can be submitted via the department's have your say page for the 2024 Regional Telecommunications Review. Submissions will be published to the have your say page unless the submission is

confidential or is inappropriate for publication. All submissions will be treated as non-confidential unless the submitter specifically requests that a submission, or part of a submission, is kept confidential.

Any personal information which is provided in a submission will be treated in accordance with the Privacy Policy of the Department of Infrastructure, Transport, Regional Development, Communications and the Arts and the Australian Privacy Principles.

Introduction

People in regional, rural and remote Australia rely on telecommunications services more than ever before. Digital connectivity is an essential requirement for regional people to participate economically, access services and stay connected with the rest of the country and the world. Reliable and high-speed connectivity is vital in regional areas to support public safety, day-to-day business, social inclusion, and access to essential health and education services.

While there have been improvements to telecommunication services in regional, rural and remote Australia, there remains a digital divide between Australia's regions and urban centres. As distance and remoteness increase and expectations of what is appropriate have changed, the challenge to deliver appropriate telecommunications grows dramatically, making it harder for regional Australia to participate fully in digital life. Additionally, First Nations communities in regional, rural and remote locations face unique barriers and challenges in accessing telecommunications services, such as affordability constraints, and low levels of connectivity and digital literacy. They may also struggle to access appropriate infrastructure, services/plans and devices, which further exacerbates the digital divide.

Regional, rural and remote Australians rightly expect to be able to access affordable, adequate, reliable and resilient telecommunications services that meet their needs. These services are essential to economic and social wellbeing in regional and remote places. Regional Australia is disproportionately affected by natural hazards and emergencies, as shown recently by bushfires in Western Australia and Victoria, as well as Cyclone Jasper and associated flooding. The risk to life and property during these events is compounded when residents and emergency services cannot access appropriate connectivity.

With telecommunications playing an increasingly vital role in modern society, ensuring the reliability and resilience of communication networks in regional areas is essential. Anticipating the impact of changing climates and more frequent severe weather events further underscores the imperative for sustained focus on the resilience and reliability of regional networks during emergencies and natural disasters. Solutions must address the ongoing commitment to the maintenance of infrastructure, the possibility of shared infrastructure, power redundancy, the timely restoration of power where there are power outages, and the need for telecommunication providers to supply timely backup power in the event of broadscale power outages, especially in remote communities.

The 2022-23 Telecommunications Industry Ombudsman Annual (TIO) Annual Report emphasises the need to ensure a fit-for-purpose regulatory regime that reflects current consumer expectations of the telecommunications market and is attuned to changes in the telecommunications market, how people are using different ways to communicate, and ensuring there are adequate consumer protections in the digital platforms space.

Despite ongoing challenges, new opportunities are emerging in regional Australian telecommunications. Public and private investments are steadily improving the availability and quality of communication services. However, these advancements need to keep pace with evolving consumer needs and expectations. While new and emerging technologies offer exciting possibilities, they also introduce increased complexity for some users.

As new and emerging technologies continue to offer alternatives to traditional approaches to delivering telecommunications, the Australian Government is currently consulting on modernising the delivery and funding framework for universal access to basic telecommunications services.

The continuing deployment of 5G mobile services, the acceleration and competition of Low Earth Orbit (LEO) satellite services, and the desire by government to appropriately serve regional areas creates opportunities to explore more innovative solutions to connect regional and remote Australia.

In May 2023, the Australian Government introduced the Regional Investment Framework as its approach to supporting strong and sustainable regions. The Framework is a new approach to how the Australian Government delivers regional investment – valuing local voices and priorities, being informed by and building the evidence, operating with flexibility, integrity and transparency and coordinating across governments to

make investments work better in regional Australia. It provides an integrated and coordinated framework for regional development regardless of a region's economic circumstances.

Through this Review, the Committee wants to engage with the views and experiences of regional and remote Australians, and businesses serving them, in getting and staying connected, including the challenges to access and the unique barriers faced by First Nations people in remote communities.

The Committee values your opinion and wants your input. It wants to know what is working, what is not and your solutions, including new technologies and how these may address connectivity challenges in regional areas.

Key issues

The Committee seeks views on a wide range of telecommunications issues, barriers and challenges in regional, rural and remote Australia and proposed solutions to address these.

Telecommunications consumers

Being and staying connected

Telecommunications consumers, businesses, educational and health services, industries and visitors in regional, rural and remote Australia need to be connected and stay connected. Accessible, reliable and affordable telecommunications networks and services are critical to enable Australians to go about their day-to-day activities and to achieve equity with their urban counterparts.

Reliability

Network reliability issues disrupt daily activities like work and study and can hinder regional businesses' ability to connect with clients or process customer payments. Telecommunications challenges in remote communities can restrict residents' access to fundamental services like grocery shopping, banking, education and healthcare

Many issues impact on the everyday reliability of existing telecommunications in regional areas, rural and remote locations, and service reliability is often poorer than in urban areas.

Issues that can and often do impact reliability include:

- more frequent interruptions to state-managed power supplies leading to more frequent service outages
- relatively poor performance of regional telecommunications providers in maintaining their network infrastructure
- challenges maintaining a sustainable network (skilled workforce, availability & location)
- lack of competition
- the scale of and practical challenges in delivering and supplying telecommunications infrastructure in difficult and different terrains
- the expense of repairing network outages quickly in more remote areas when things go wrong.

Service interruptions can occur through power outages, storms, floods, bushfires, cyclones and even rodent damage or copper theft. Copper and other networks used to provide voice services in regional areas are aging and are an increasing challenge for service providers to maintain to a standard expected by regional consumers.

Network capacity

Network capacity issues are also a day-to-day challenge in some regional areas. Capacity issues are compounded during peak tourist seasons, during local events like agricultural shows or when construction projects bring new people into an area.

The redundancy of telecommunications networks is even more important, as is the ability of consumers to access multiple types of connectivity so they can remain connected when a service goes down.

It is critical that the energy sector, which is a state responsibility, and the telecommunications sector work together effectively to align their activities to ensure good quality connectivity in regional, rural and remote areas.

You don’t know what you don’t know

These challenges are further compounded by a lack of awareness and understanding of available telecommunications services. Many consumers in rural, regional and remote areas also choose to access multiple services to provide redundancy.

Connectivity literacy is the knowledge needed by a consumer to understand how to get and stay connected to services that meet their needs and budget. It can be difficult for some consumers in regional, rural and remote Australia to understand:

- what services they can access
- which provider to choose
- what plan and equipment best suits their specific situation
- how to stay safe online
- where to go to get help or report an issue.

Consumers rely on a mix of resources to identify options. Provider websites naturally prioritise their own offerings, making comparison difficult. Consumer advocacy groups offer valuable guidance and resources, many of which are created by volunteers. They can lack comprehensive comparisons and it is difficult for volunteer organisations to keep these resources up to date. Third-party comparison sites offer convenience, but their objectivity can be compromised by paid placements. The NBN website helps with availability checks, but given NBN’s wholesale only status, it does not compare providers on a consumer’s specific connection, or provide information about other connection options that might be available.

The Regional Tech Hub

The Regional Tech Hub service is designed to help people outside urban centres get connected and stay connected. It provides targeted information resources and direct assistance to its customers. However, consumers who want to be better connected still need to navigate through large amounts of information from differing sources. Retail service providers have little incentive to give unbiased information to consumers regarding what is available to them.

The prevalence of information gaps and misinformation have real consequences for consumers and businesses. The lack of standardised comparisons makes it hard to assess the availability of connection types, inclusions, excess data charges, call bundles, network coverage and equipment needed specific to their location. Vulnerable consumers, especially those in regional areas with fewer choices, are particularly disadvantaged.

A lack of connectivity literacy and scarcity of independent and accurate advice in regional telecommunications impacts all sectors including education, health, agriculture and small business. It also potentially affects the ability of communities, local and state/territory governments to participate in funding opportunities and infrastructure upgrades.

The Committee is eager to gather perspectives on the adequacy and reliability of telecommunications for consumers in regional, rural and remote areas. The Committee is also keen to hear about your experiences with service disruptions and day-to-day reliability, including how service providers manage outages and maintain networks.

Independent Audit of Mobile Coverage

The National Audit of Mobile Coverage is a component of the Australian Government's Better Connectivity Plan for Regional and Rural Australia and a 2022 election commitment. The Audit will help the government to better identify mobile coverage black spots, target future investment and help assess the accuracy of carrier coverage maps. The department is finalising procurement of the Audit, and an announcement is anticipated in early 2024.

The Audit responds to long-standing public concerns about the accuracy of mobile carriers' coverage maps. For example, the 2021 Independent Regional Telecommunications Review noted community concerns about these maps and recommended the government undertake an investigation and audit to collect and report mobile coverage performance across regional Australia, including congestion.

Digital Inclusion

Digital inclusion is about being able to access, afford and effectively use digital technologies – having available infrastructure and the knowledge to use it. In an increasingly connected, online world every Australian should be able to benefit from digital technologies.

Digital technologies allow us to access health, education and government services, participate in social and cultural activities, conduct business, find important information, and connect with family, friends and the wider world. However, many regional Australians experience a digital divide because of where they live. This digital inclusion gap is a serious problem that increases dramatically with remoteness.

The Australian Digital Inclusion Index (ADII) measures digital inclusion using the dimensions of Access, Affordability and Digital Ability. Although the ADII 2023 shows slight improvement in digital inclusion at the national level, it also shows a persistent and considerable gap in digital inclusion between those living in capital cities and those living in regional areas.[1]

The ADII also highlights vulnerable groups who are highly digitally excluded, and this accompanies higher digital exclusion for those living in regional and remote areas. These include First Nations people, those aged over 75 years old, people with lower incomes and lower levels of education, and mobile-only users. For example, households in regional and remote Australia on average have lower incomes, meaning affordability of services is a barrier for some.

First Nations Communities

The digital divide is disproportionately experienced by First Nations peoples in Australia. A significant national gap in digital inclusion exists, widening dramatically for those in remote and very remote communities. These communities rank among the most digitally excluded in the country.

There are currently 670 First Nations communities and homelands that do not fall within areas of mobile coverage. The National Agreement on Closing the Gap aims to address this by setting a target for equal digital inclusion for First Nations people by 2026, however progress against closing this gap is slow.

Lack of affordable and appropriate services may be a key culprit. Many remote First Nations communities have no or inadequate mobile service, may find per-premises connections expensive and inflexible, and instead rely solely on shared public phones. However, the telecommunications industry and remote communities are tailoring local solutions using technologies like Wi-Fi mesh networks and Wi-Fi hotspot networks, including through LEO satellite connectivity. These advances demonstrate the potential for new technologies to bring connectivity to areas lacking terrestrial infrastructure.

There is also a pronounced gap in digital ability for First Nations people in remote areas, partly due to high levels of mobile-only use, lower levels of formal education, limited digital training or support and English often being a second or third language.

Improving the ability of First Nations people to access affordable telecommunications services is critically important to enable them to participate equitably in the digital world and make informed choices about their lives, just like Australians in better connected areas.

The Australian Government has established the First Nations Digital Inclusion Advisory Group (Advisory Group) to provide advice on practical measures to support improved First Nations digital inclusion, based on

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[1] Australian Digital Inclusion Index 2023; www.digitalinclusionindex.org.au

the outcomes of its engagement with First Nations organisations and communities. The Advisory Group is being guided by the principles and objectives of the National Agreement on Closing the Gap.

In response to the recommendations in the initial report provided by the Advisory Group last year, the government has recently announced funding for Community Wi-Fi services in around 20 remote communities so First Nations people can access government services, education and stay connected. This is an initial measure, and it is acknowledged that if Closing the Gap Target 17 is to be achieved by 2026 more needs to be done. It is also important that the design of future measures involves First Nations people, which will help determine the most culturally appropriate approach.

Consumer protection

Australia's telecommunications sector underpins economic activity, education, entertainment, healthcare and personal connections. Consumers need reliable, high quality and accessible services. An effective consumer protection framework is needed to ensure consumers receive fair and reasonable treatment from their provider, can make informed decisions about products and services, and stay connected.

The *Telecommunications Act 1997* (Telecommunications Act) and the TCPSS Act form the legislative bedrock of consumer protection in telecommunications. These Acts establish core obligations and arrangements, including for reasonable access to broadband and standard telephone services (STS) across Australia, and access to dispute resolution through the Telecommunications Industry Ombudsman (TIO) scheme when things go wrong. The economy-wide Australian Consumer Law also applies to telecommunications and provides safeguards against unfair treatment, as well as consumer rights and guarantees.

In addition to the legislative framework, consumer protections are set out in regulatory instruments and industry-developed codes. The Australian Communications and Media Authority (ACMA) plays a pivotal role in this system. The ACMA decides whether to register industry codes, monitors compliance, and investigates complaints. The ACMA also develops regulations, primarily industry standards and service provider determinations, and enforces the various telecommunications-specific rules. The Australian Consumer Law is enforced by the Australian Competition and Consumer Commission (ACCC) and relevant fair-trading entities in each state and territory.

A key industry code in the consumer protection space is the Telecommunications Consumer Protections Code (TCP Code). This TCP Code sets out a retail-level code of conduct for telecommunication providers, addressing critical areas such as sales, advertising, contracts, customer service, billing, dispute resolution and termination of services. Key industry standards include the Consumer Complaints Handling Standard and the new Financial Hardship Standard – in 2023 the Australian Government directed the ACMA to issue the Financial Hardship Standard to ensure telecommunications providers provide appropriate support to customers experiencing financial hardship.

Complaints to the TIO have generally been falling in recent years, which indicates improved consumer experience. However, issues remain, including for particular consumer cohorts experiencing vulnerability. A 2023 ACMA position paper, *What consumers want – Consumer expectations for telecommunications safeguards*, concluded that telcos are falling short of what customers want in key areas such as selling practices, credit assessments, payment methods, disconnection processes, financial hardship assistance and the treatment of consumers in vulnerable circumstances, including those experiencing domestic and family violence. Key stakeholders including the TIO, the ACMA, the ACCC and the Australian Communications Consumer Action Network (ACCAN) have advocated strongly for improvements to existing arrangements and consumer outcomes.

The report of the *2021 Regional Telecommunications Review: A step change in demand*, made a range of findings and recommendations related to customer service standards, issues resolution, consumer education and information. The Australian Government has made it clear that it is continuing to review the safeguards framework to ensure it remains fit for purpose. We note the industry body, Communications Alliance, is currently undertaking a review of the TCP Code, with the expectation of a revised code in 2024. The ACMA has clearly set out its expectations on required improvements and has indicated its willingness to directly regulate these matters if sufficient progress is not made.

1. **What initiatives or tools could be implemented by the telecommunications industry or the Australian Government to improve connectivity literacy and make it easier for regional consumers and businesses to understand their connectivity options and help them to choose affordable services that meet their needs?**
2. **What further initiatives can be implemented to support First Nations communities in developing and leading their own digital inclusion solutions while ensuring cultural appropriateness?**
3. **How can government and industry address any misleading and inaccurate information surrounding telecommunications services in regional, rural and remote areas, to ensure consumers and businesses have access to reliable and unbiased information when making decisions about their connectivity options?**
4. **Deploying and maintaining telecommunications infrastructure in remote areas requires a skilled workforce. What initiatives can be implemented to ensure there is a skilled workforce in regional and remote Australia capable of supporting the construction, maintenance and operation of future-proof telecommunications infrastructure?**

Universal service arrangements

Current arrangements ensure that all Australians have reasonable access to basic phone and internet services through the USO (phone lines & payphones) and the SIP regime (broadband). The Government is reviewing these arrangements via the better delivery of universal services process to ensure that regulations keep up with technology changes and community needs. Universal service arrangements are of particular importance to people in regional, rural and remote Australia.

The Independent Regional Telecommunications Review Committee would also like to hear about your ideas for a modern system and will consider feedback in 2024. The Australian Government will ensure that there are reliable alternatives before changing anything.

Fixed voice services

Australians everywhere have guaranteed access to basic phone services under the Universal Service Obligation (USO). The USO is established by the TCPSS Act. It designates Telstra as the main provider for standard telephone service (STS) and payphones.

Telstra is bound by a contract, the Telstra Universal Service Obligation Performance Agreement (TUSOPA), to deliver these services. Telstra receives an annual payment of $230 million to deliver voice services and $40 million to deliver payphone services. Under the TUSOPA, Telstra is also required to offer services on its existing copper network to customers outside the NBN fixed line footprint In addition to copper, Telstra delivers STS over satellite, radio CAN, Telstra-owned fibre and NBN fibre. Funding for universal services delivery is partly from the Telecommunications Industry Levy (TIL), to which telecommunication companies contribute based on their revenue, and partly by a direct budget allocation.

The Customer Service Guarantee (CSG) complements the USO by ensuring timely installation, repair and appointments for phone services. If Telstra or another provider fails to meet these timeframes, they may be required to compensate the customer. As the USO provider, Telstra is obligated to offer CSG, while other providers often ask new customers to waive this right.

There are further arrangements that also complement the USO for those with life-threatening medical conditions. Through priority Assistance arrangements, Telstra must seek to provide faster connection and repair times for phone lines in these households. Additionally, Telstra is required to report on service availability, fix poorly performing parts of it network, and investigate and remediate services with re-occurring faults under the Network Reliability Framework. Specific metrics related to regional and remote phone services are also reported by Telstra.

USO Payphones

Telstra, by law, must also install and maintain reasonable access to payphones across the country. These phones offer a public communication option, especially in areas with weak mobile coverage or for those who cannot afford a personal phone line. They are crucial for vulnerable community members.

While payphone usage had been declining, Telstra made all local and national calls from these phones free in 2021. This led to a jump in calls, from 7 million to 23 million annually. However, individual usage varies by location.

Regulations ensure payphone quality. Telstra must provide local, national and international calling, 24/7 access, free emergency calls and operator assistance. Payphone locations, complaint procedures and repair timeframes are also regulated.

While not required to do so under TUSOPA, Telstra has added free Wi-Fi to some payphones and is improving power backup to payphones in disaster zones, further enhancing their usefulness.

Fixed broadband

The Statutory Infrastructure Provider (SIP) regime provides for access to fixed broadband services. The SIP regime mandates a wholesale obligation for connectivity, ensuring all premises have the potential for broadband access. NBN serves as the default SIP nationwide, deploying a mix of fixed line, fixed wireless and satellite technologies to deliver broadband services. Other carriers may become SIPs in specific circumstances, such as servicing new developments through contracts or ministerial designations.

All SIPs are obligated on request to connect premises and provide wholesale services that allow retail providers to offer broadband with peak speeds of 25/5 Mbps for downoad and upload. For fixed line and fixed wireless networks, these wholesale services must also support basic voice calls, reflecting their ability to accommodate quality voice services. However, this voice support requirement does not apply to satellite broadband services. This is because while it is technically possible to makevoice calls on NBN's Sky Muster satellites and other geostationary satellites in Australia, geostationary satellite technology introduces increased latency (delay), which can negatively impact voice call quality and user experience.

To ensure broadband accessibility in regional areas, NBN's non-commercial fixed wireless and satellite services are financially supported by the Regional Broadband Scheme (RBS). Under the RBS, carriers with high-speed broadband infrastructure contribute a monthly charge for each premises with an active service. The scheme includes transitional concessions and exemptions for smaller networks, and an offset arrangement for NBN's contribution. Essentially, NBN's fixed line network and similar high-speed services from other carriers financially support the delivery of NBN's net loss-making fixed wireless and satellite services in regional areas. This ensures a baseline level of broadband access for all Australians.

New opportunities

Australia's regional, rural and remote phone and internet landscape is changing. Telstra's legacy networks are shrinking, with fixed voice services dropping from 600,000 in 2018 to 300,000 in 2023. NBN upgrades are improving broadband quality, including a major fixed wireless network upgrade. This will expand coverage and minimum speeds, reaching approximately 120,000 additional premises and supporting reliable voice services.

Beyond NBN, new technologies are emerging. Low Earth Orbit (LEOSat) broadband is becoming widely available, even in remote areas. LEOSat offers lower latency (delay) than traditional satellites, making it better for voice calls. Companies like Starlink already have broad Australian coverage with potential for bundled voice-and-broadband services. Other LEOSat platforms like OneWeb and Amazon's Kuiper network are expected to join the market soon.

Direct-to-device (D2D) satellite technology is another potential option. Optus partnered with Starlink to offer mobile connectivity in uncovered areas, with plans for SMS by late 2024, and voice and data to follow later. D2D allows mobile solutions by communicating directly with a standard mobile device that connects to terrestrial mobile service, unlike traditional satellite phones that require specific handsets. Telstra has announced that in 2024 it will be working towards a D2D trial with basic connectivity (initially text only) with Lynk Global to explore and test direct to handset satellite technology.

While LEOSat and D2D offer promising solutions, regional consumers will likely expect that technologies demonstrate a reliable baseline service level before replacing existing USO arrangements. The Australian Government also needs to ensure proper regulations are in place for new options.

5. **Could the NBN fixed wireless network or other alternative networks be used to provide reliable and affordable voice services in remote areas? Are there any consumer safeguards or guarantees that need to remain or be changed under reformed universal service arrangements?**
6. **In modernising universal service arrangements, should access to public phone infrastructure continue and are there particular areas of need? Could technologies beyond traditional payphones be explored to meet this need?**

7. What should the minimum internet speed guarantee be (currently a peak speed of 25/5 Mbps) to meet modern needs? Should minimum data download/upload allowances be regulated? What other factors are important, like latency, reliability and affordability?

Mobile

Australians use mobile phones more than any other type of device to connect to the internet and make phone calls.[2] Staying connected in regional and remote Australia can be a challenge due to several factors. Limited capacity and maintenance issues can strain mobile network resources in these areas. Even when infrastructure is functional, the vast distances involved present hurdles. Building and maintaining cell towers across sparsely populated regions is expensive, making it commercially difficult for operators to expand coverage in those areas. Australia's rugged landscape itself plays a role. Factors like terrain, atmospheric conditions, cloud cover, artificial barriers and dense trees can also disrupt and weaken signal transmission from mobile phone towers, creating patchy coverage or complete dropouts in mobile service. These combined issues can significantly impact daily life for residents and businesses in regional, rural and remote areas.

Mobile carriers collectively claim that mobile services are available to where 99.5% of Australia's population live but only 33% of the Australian landmass. Commercial interest in investing in new mobile infrastructure in regional and remote Australia varies, with mobile services overwhelmingly provided by Telstra. Optus has an increasing presence and TPG Telecom is present in some of the more populated locations.[3] Rural and remote mobile phone users may have access to services provided by only one mobile network operator (usually Telstra) and some have no mobile access at all.

All 3 mobile network operators, Telstra, Optus and TPG Telecom, publish mobile coverage maps. However, existing maps of mobile coverage involve a degree of prediction of expected outdoor coverage, so do not necessarily reflect the availability of reliable mobile connectivity. It is also unclear if the operators publish their coverage maps using the same predictive modelling settings, making comparisons of coverage between the operators difficult to judge. Individual experience of mobile coverage at any given location can be affected by the type of handset used, local terrain, the location and design of buildings and foliage.

The National Audit of Mobile Coverage is a component of the government's broader Better Connectivity Plan for Regional and Rural Australia. It will provide an independent data source to help to identify mobile coverage black spots, target future investment and assess the accuracy of carrier coverage maps.

Telstra and Optus are intending to switch off their 3G networks so the radiofrequencies currently used for 3G can be redeployed to deliver 4G and 5G services. TPG has already switched off its 3G network. The relevant switch off dates and announcements for each mobile network operator are as follows:

- Telstra plans to close its 3G network from 30 June 2024 (announced in October 2019)
- Optus plans to close its 3G network from 1 September 2024 (announced in April 2022)
- TPG's 3G network ceased operation over the 6 weeks from 15 December 2023 to 30 January 2024 (announced in September 2022).

Telstra has committed to ensuring that its 4G network coverage is equivalent to its current 3G network coverage. Optus has also indicated its intention that there will be no loss of coverage following its 3G closure.

5G mobile networks are increasingly providing coverage across Australia. There are 2 approaches to delivering 5G networks: non-standalone (NSA) and standalone (SA).[4] 5G NSA networks need existing 4G infrastructure and use new 5G technology. This allows faster deployment but limits the full potential of 5G capabilities. In

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[2] Communications and media in Australia series: How we use the internet (acma.gov.au)
[3] Mobile Infrastructure Report 2023 | ACCC
[4] For more information see 5G System Overview (3gpp.org)

contrast, 5G SA networks use their own 5G infrastructure enabling the full range of 5G benefits to be realised, including significantly improved speeds, lower latency and greater network flexibility. While requiring more time and investment, 5G SA enables greater potential of 5G technology and supports more innovative applications and services across various industries.

As the 5G rollout progresses into regional and remote areas, it is likely that mobile network operators will face commercial barriers to providing 5G SA technology due to the high cost of building a new core network for a limited user base.

The Internet of Things (IoT) connects a wide range of devices with sensing, processing and control abilities. These low-cost devices, from sensors to factory equipment, form large networks. Unlike the internet connecting people, IoT connects machines to each other and servers. While often using familiar networks (Wi-Fi, 4G), IoT also uses specialised options like Long Range Wide Area Network (LoRaWAN) for low-power, long-range communication. By providing timely data and enabling control, IoT aims to boost efficiency and productivity. With the growing need for efficiency and sustainability across industries, IoT usage is expected to surge in the near future.

Direct-to-device (D2D) LEO satellite technology is emerging as a potential future alternative or complementary service to existing terrestrial mobile services. While promising for emergency services and basic communication in remote areas, D2D is still in its early stages, and questions remain regarding efficacy, affordability and widespread device compatibility.

8. **How can we achieve equity with respect to mobile services (voice, data and SMS) in regional, rural and remote communities and on regional and remote roads?**
9. **How can we ensure regional, rural and remote areas have access to the networks, equipment and capacity they need for improved household connectivity and to foster innovation and efficiency across regional industries, including for IoT applications?**

Fixed broadband

NBN provides fixed broadband across Australia via fixed-line, fixed-wireless and Sky Muster satellite services. Many relatively small towns in regional and remote areas may have fixed line NBN within the township itself, but outlying areas are often serviced by fixed wireless or satellite services. Existing ADSL services are commercially available outside the NBN fixed line footprint and can theoretically offer broadband speeds of up to 24 Mbps. But in practice, actual speeds are likely much lower, with speeds declining based on the length of copper between the exchange and each individual premises. Changes in customer preferences, emerging technology, and challenges for operators to train staff and find spare equipment to maintain copper based networks into the future are also making these services increasingly redundant. Non-NBN Wireless Internet Service Providers (WISPs) and non-NBN fibre providers offer high-speed broadband services in some areas, giving some regional customers more choice.

NBN continues to upgrade its existing fixed line network to enable access to full fibre, including in some rural and regional areas. Households in eligible areas can upgrade to full fibre connection when they choose a high-speed plan.

NBN is also upgrading its fixed wireless and geostationary satellite networks to deliver improved services by the end of 2024. The upgrade is supported by a $480 million Australian Government contribution. The upgrade is expanding the fixed wireless network to allow 120,000 premises on NBN satellite to access NBN fixed wireless and enabling higher speed services to be offered on the NBN fixed wireless network. This movement of premises off NBN satellite enables NBN to offer better quality services to consumers remaining on NBN satellite services (including increased data allowances, 24/7 uncapped plans and higher speed tiers).

Fixed broadband is now being offered via LEO satellite across Australia. Starlink is already providing services and other satellite services, such as Amazon's Project Kuiper and OneWeb, are coming into the market. LEO satellites orbit much closer to earth compared to traditional geostationary (GEO) satellites.

Telecommunication services supplied by traditional GEO satellites have higher latency (signal delay), limiting the effectiveness of this platform for real-time applications, including for voice calls. In contrast, LEO satellites which are positioned significantly closer to Earth, offer considerably lower latency and faster data speeds.

LEO satellite internet services have the potential to enhance internet access in remote parts of the country, particularly in areas where traditional terrestrial infrastructure deployment is impractical or cost prohibitive. However, some concerns remain in relation to:

- shorter lifespan: LEO satellites have a shorter lifespan (around 5 – 7 years) compared to traditional satellites (15+ years). This necessitates frequent launches to maintain coverage, raising questions about long-term sustainability
- foreign ownership: There is a lack of certainty about whether foreign operators would prioritise Australian sovereign concerns over commercial interests
- installation and support: There is a growing demand for qualified professionals, system integrators and installers who can install and support LEO satellite services. There is also a risk of inadequate support, posing potential risks for consumers. This challenge is not unique to Australia; It is also occurring in other parts of the world.

10. **The cost of building and maintaining telecommunications infrastructure in rural and remote areas can be a barrier to offering better services. What can be done to improve the fixed broadband options available to regional, rural and remote Australians?**
11. **Have you had experience with new or alternate service providers such as Starlink or WISPs? If not, why not? What additional measures would persuade you to consider new technologies?**

Disaster resilience and emergency

The ability to communicate during natural hazard events and emergencies is critical for the safety of communities and to help coordinate emergency response. Telecommunications help to keep residents informed and provide timely information to emergency personnel during emergencies and natural disasters. While telecommunications providers actively plan for emergencies and natural hazard events, services may become unavailable due to loss of power supply or direct damage.

No communications network is impervious to natural hazards, but regional, rural and remote Australians expect to be able to communicate effectively when disaster strikes, to help them navigate these events as safely as possible.

A key challenge is maintaining mobile services during and after disasters, particularly when infrastructure is cut off from mains power. For example, in severe bushfire events far more mobile service outages tend to be caused by loss of power than by direct fire damage.[5] When mobile infrastructure loses power during a natural hazard event, devices cannot make or receive emergency calls or access the internet even if residents have power elsewhere.

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[5] See Findings from the 2019-20 bushfire season | Department of Infrastructure, Transport, Regional Development, Communications and the Arts

During emergencies, people's reliance on internet and mobile services increase, putting extra pressure on networks. This extra demand can overload networks and stop critical calls from getting through. It can also mean network backup power supplies are more rapidly exhausted.

The Australian Government's Mobile Network Hardening Program currently funds resilience upgrades, including backup power upgrades like batteries and portable or permanent generators, to mobile infrastructure in regional and remote Australia. It can also fund site hardening activities to mitigate against potential disaster impacts where possible.

A national Public Safety Mobile Broadband (PSMB) capability has been proposed to enhance the effectiveness and coordination of emergency services personnel, increasing their safety and that of communities in emergencies, particularly those in regional areas where connectivity can be challenging.

The government has funded the National Emergency Management Agency (NEMA) to drive the delivery of a PSMB capability over the next 2 years. This work will examine delivery options and settle funding and operational arrangements with states and territories before providing options to government on a PSMB.

A temporary disaster roaming (TDR) capability would provide temporary access to other mobile network operators' (MNOs) mobile networks during disasters and emergencies.

Following the previous Regional Telecommunications Review's recommendations in relation to TDR, the ACCC was directed to consider the feasibility of temporary mobile roaming during natural hazards and emergencies. The ACCC has found that TDR is feasible, but questions remain about its technical complexity. Key challenges include network capacity, the MNOs reaching agreement on implementing TDR, as well as the role state and territory governments and emergency services organisations should play in declaring and responding to emergency events and natural hazards with a TDR capability. Ministers are considering the report.

Following a recent round of consultation, the Department of Infrastructure, Transport, Regional Development, Communication and the Arts and NEMA provided a scoping report to the Minister for Communications and the Minister for Emergency Management on perspectives on the adequacy, reliability and resilience of telecommunications in regional, rural and remote areas during emergencies and natural disasters. Particularly noteworthy to the Committee are views on TDR and its feasibility.

12. **What can be done to maximise access to multiple connectivity options in case of outages?**
13. **What can be done to increase capacity and improve the reliability of telecommunications services in regional, rural and remote Australia?**
14. **How can the energy and telecommunications sectors work more effectively, especially with respect to redundancy?**
15. **What innovative solutions can be explored to ensure telecommunications infrastructure remains operational during and after natural disasters? How could partnerships with local communities improve the maintenance, security and availability of infrastructure?**

The impact of government and private investment

The Australian Government recognises the crucial role telecommunications services play in the lives of Australians, particularly in regional and remote areas. However, commercially driven investment in these areas can be constrained due to a smaller market and higher costs of installing and maintaining equipment.

The capital-intensive nature of the industry also has implications for the competitiveness of the sector, with the higher costs to entry associated with regional deployment potentially limiting the number of participants in the market. However, the expansion of services to those underserved, combined with the ongoing increase in the demand for services that require reliable and fast data services, requires ongoing investment.

Despite these challenges, private investment is occurring in regional Australia. For example, Wireless Internet Service Providers (WISPs) offer localised solutions for specific communities. Some WISPs have found significant success in bridging the digital divide in regional Australia by specifically targeting underserved regional, rural and remote areas. They leverage a mix of technologies to deliver internet access, often utilising existing infrastructure or partnering with local communities to build new infrastructure.

Additionally, there has been private investment in establishing 'private networks' that provide connectivity for particular enterprises. Private networks are already prevalent in Australia, especially in the mining, resources and maritime sectors. There are also investments being made to support the anticipated increase in use of new technologies in Australia. For example, HyperOne is deploying a new nationwide backhaul fibre network and Telstra is spending $1.6 billion on top of its normal capital expenditure to increase the capacity of its existing backhaul fibre networks.

Carriers have made large capital investments in their mobile networks over time (3G, 4G and 5G) and necessary supporting network infrastructure such as mobile towers, backhaul and resilience measures. However, in the last few years carriers have chosen to divest fixed and passive infrastructure in order to free up the capital needed to invest in other service offerings. This has seen growth in 'tower companies' whose specific focus is on infrastructure development. Recently there have been large divestments in tower assets from Telstra, Optus and TPG Telecom to tower companies like Amplitel, Indara and Waveconn, which have grown to become the 3 biggest mobile network infrastructure providers in Australia. From late 2020 until the end of 2022, over 13,800 of Australia's approximately 16,500 towers have swapped hands and are now owned by one of these tower companies.[6]

Despite this change in investment patterns, the level of impact private investment is having in providing new and improved connectivity for people in regional, rural and remote areas of Australia remains unclear.

GovernmentInvestment and regional communications policies

This section briefly outlines Australian Government policies and initiatives aimed at improving regional communications infrastructure and affordability. The committee is interested to hear about your awareness of and experiences with these programs.

The delivery of telecommunications services to regional areas has always been a key policy priority of the Australian government.

The Better Connectivity Plan for Regional and Rural Australia

The Better Connectivity Plan for Regional and Rural Australia (the Better Connectivity Plan) is a key initiative and part of the Australian Government's telecommunications agenda. It is providing more than $1.1 billion to rural and regional communities.

Regional Roads Australia Mobile Program

The Australian Government is providing $50 million to state and territory governments to conduct pilot programs of the Regional Roads Australia Mobile Program under the Better Connectivity Plan.

Pilot programs will trial new, novel or innovative approaches to increase mobile coverage on highways and major roads in regional and remote Australia, with a strong focus on delivering multi-carrier outcomes.

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[6] www.towerexchange.com: '5 Big ideas that will shape the Australian Tower Market in 2023', January 2023

On Farm Connectivity Program

The Australian Government's On Farm Connectivity Program is providing $30 million over 2 years to enable eligible primary producers in agriculture, forestry and/or fisheries to take advantage of connected machinery and sensor technology.

Mobile Network Hardening Program

The Mobile Network Hardening Program (MNHP) is funding upgrades ($23.5 million under Round 1) to improve the resilience of Australia's mobile network telecommunications infrastructure in regional Australia. The $15 million Round 2 is being assessed with outcomes expected to be announced in the near future.

Peri-Urban Mobile Program

The Peri-Urban Mobile Program (PUMP) is a grants program that provides funding to improve mobile connectivity in bushfire prone areas on the peri-urban fringe of Australia's major urban and regional cities. Up to $63 million has been committed to 3 rounds of the program, with Round 1 supporting delivery of mobile solutions in 6 major cities. Round 2 has been expanded to include 13 regional cities and recently closed for applications, with outcomes to be announced in due course.

The Mobile Black Spot Program

The Mobile Black Spot Program (MBSP) is a long-running Government competitive grants program that invests in telecommunications infrastructure to improve mobile coverage and competition across Australia.

The MBSP is supported by co-contributions from state and local governments, national Mobile Network Operators (Optus, Telstra, TPG Telecom Ltd (formerly Vodafone) and Mobile Network Infrastructure Providers (Field Solutions Group and OneWi-Fi).

The Regional Connectivity Program

The Regional Connectivity Program (RCP) is a competitive grants program funding 'place-based' telecommunications infrastructure projects which respond to local priorities and maximise economic opportunities and social benefits for regional, rural and remote Australian communities and businesses.

The RCP complements the NBN and the MBSP by targeting the delivery of new and improved access to broadband and improved mobile connectivity in areas of high economic and social value primarily outside of the NBN fixed-line footprint.

The Regional Tech Hub

The Regional Tech Hub (the Hub) was launched in December 2020 to provide independent and factual information to help people in regional and rural Australia get connected and stay connected more easily.

The Hub provides a range of practical resources aimed at helping regional consumers find appropriate telecommunications services in their area, as well as troubleshooting tips, escalating faults with service providers and helping users to understand their consumer rights. The Hub also provides resources relating to online security and e-safety to assist people in regional areas to have a safe and positive online experience.

School Student Broadband Initiative

In February 2023, the Minister for Communications launched the School Student Broadband Initiative, providing free NBN services to up to 30,000 unconnected families with school-aged children. The Initiative was recently extended until 31 December 2025 and aims to boost education opportunities and narrow the digital divide amid cost-of-living pressures.

NBN is leading implementation of the Initiative, working with over 60 nominating organisations and a National Referral Centre to identify eligible families.

Key Challenges

Notwithstanding the investments above, key challenges still exist in the delivery of Australian Government programs. For example, the MBSP has been running for almost a decade. Over this time overall capital costs for base stations have trended upwards, broadly consistent with increases in inflation. However, contributions from industry members have, on average, declined over time.

While the program targets expansion of mobile coverage in less commercial areas, as the various programs and rounds have progressed, carriers are necessarily competing to have mobile infrastructure subsidised in increasingly higher cost areas with lower commercial returns. With the introduction of operational expenses as eligible costs, as well as the impacts of broader cost increases in infrastructure and inflationary pressures, site-level costs to the Commonwealth have increased. This trend is expected to continue.

The time taken for MNOs and Mobile Network Infrastructure Providers (MNIPs) to deploy solutions under the program rounds has taken longer than anticipated, with the median time to deploy a base station around 36 months (compared to early expectations of sites being delivered within 18 months from announcement).

The Committee is interested to know if communities are aware of government programs. And if so, what was your experience with the grant application process, service delivery, implementation, suppliers and the effectiveness of programs in meeting their telecommunication needs.

16. **What lessons can be learned from private sector investment in regional telecommunications in closing the digital divide in regional and remote areas?**
17. **What has been your experience as a consumer of Australian Government programs aimed at improving regional communications? What improvements would you suggest?**
18. **What changes to Australian Government investment programs are required to ensure they are successful, efficient and effective in delivering improved, reliable and equitable telecommunications for regional, rural and remote consumers?**
19. **How could Australian Government programs better align with state, territory and local government planning and funding processes in delivering telecommunications services and infrastructure?**
20. **What other matters should the Committee consider in its review and why are they important?**

Other relevant reviews, inquiries and activities

Better delivery of universal services

The Australian Government is examining universal service arrangements in light of changing technologies and consumer preferences, beginning with the release of the Better delivery of universal services - Discussion paper in October 2023. The government will also establish an independent evidence base to inform whether emerging technologies are capable of delivering suitable voice services, with trials expected to commence in 2024.

Consultation on sustainable long-term funding of services in rural and remote areas is also underway, incorporating a review of the Regional Broadband Scheme (RBS).

Reviews of national Optus outage

On 9 November 2023 the Australian Government announced a review of the national Optus outage of 8 November 2023.

The Australian Communications and Media Authority (the ACMA) has opened an investigation into Optus's compliance with the *Telecommunications (Emergency Call Service) Determination 2019*, which sets out rules including rules relating to the carriage of emergency calls. The Senate Environment and Communications References Committee is also conducting an inquiry into the Optus outage. The department has provided a submission to the Senate inquiry.

Public consultation on telecommunications facilities and tower access regime

In October 2023, the ACCC published its *Regional Mobile Infrastructure Inquiry* report. It considered the recent sale of tower assets by mobile network operators to mobile network infrastructure providers, which highlights the potential for facilities access regimes to apply unevenly to these companies. The report suggested the government review the regime to ensure it effectively promotes access to towers and associated infrastructure.

In response, the department has commenced consultation on the current facilities and tower access regulatory framework and how it overlays the current market, in order to further explore whether any changes to the Telecommunications Act are necessary to promote facilities and tower access.

Independent Audit of Mobile Coverage

The National Audit of Mobile Coverage is a component of the government's Better Connectivity Plan for Regional and Rural Australia and a 2022 election commitment. The Audit will help the Government to better identify mobile coverage black spots, target future investment and help assess the accuracy of carrier coverage maps. The department is finalising procurement of the Audit, and an announcement is anticipated in early 2024.

House of Representatives – Connecting the country: Mission critical

On 15 November 2023, the House of Representatives Standing Committee on Communications and the Arts published its final report on its inquiry into the experience, opportunities and challenges for co-investment in multi-carrier regional mobile infrastructure.

The report includes 23 recommendations, many of which seek to improve, or address barriers to, multi-carrier outcomes in regional and remote areas. The government is expected to publish its response to the Report's recommendations in mid-2024.

Telecommunications Consumer Protections Code

On 6 July 2023, the ACMA released a position paper on reforming the Telecommunications Consumer Protections (TCP) Code, calling upon industry to make significant improvements in 6 key areas of the TCP Code: responsible selling, credit assessments, payment methods (direct debit), financial hardship, disconnection, and consumers in vulnerable and disadvantaged circumstances.

Communications Alliance (CA) provided its proposed reforms in December 2023 for the ACMA's consideration, which included new obligations on the provision of mobile coverage information during the sales process and remedies where coverage does not allow adequate service usage.

Following consideration of the first draft submitted, the ACMA has provided additional guidance to Communications Alliance and requested a further draft of the Code be submitted to it in May 2024.

The TCP Code review is led by industry through Communications Alliance (CA). A Review is required at least every 5 years. The review is expected to be finalised by mid-2024.

Senate inquiry into the shutdown of the 3G mobile network

On 26 March 2024, the Senate referred an inquiry into the shutdown of the 3G mobile network and telecommunications services accessibility to the Rural and Regional Affairs and Transport References Committee, for inquiry and report by 30 November 2024. The Committee will consider a range of issues, including the impact on access to Triple Zero emergency calls, the absence of 4G services in rural and regional areas previously covered by 3G, the impact of a lack of telecommunications services on the economic and social circumstances of those who live in regional Australia, and service provision and coverage

Appendix A – List of questions

1. **What initiatives or tools could be implemented by the telecommunications industry or government to improve connectivity literacy, and make it easier for regional consumers and businesses to understand their connectivity options and help them to choose affordable services that meet their needs?**
2. **What further initiatives can be implemented to support First Nations communities in developing and leading their own digital inclusion solutions while ensuring cultural appropriateness?**
3. **How can government and industry address any misleading and inaccurate information surrounding telecommunications services in regional, rural and remote areas, to ensure consumers and businesses have access to reliable and unbiased information when making decisions about their connectivity options?**
4. **Deploying and maintaining telecommunications infrastructure in remote areas requires a skilled workforce. What initiatives can be implemented to ensure there is a skilled workforce in regional and remote Australia capable of supporting the construction, maintenance and operation of future-proof telecommunications infrastructure?**
5. **Could the NBN fixed wireless network or other alternative networks be used to provide reliable and affordable voice services in remote areas? Are there any consumer safeguards or guarantees that need to remain or be changed under reformed universal service arrangements?**
6. **In modernising universal service arrangements, should access to public phone infrastructure continue and are there particular areas of need? Could technologies beyond traditional payphones be explored to meet this need?**
7. **What should the minimum internet speed guarantee be (currently a peak speed of 25/5 Mbps) to meet modern needs? Should minimum data download/upload allowances be regulated? What other factors are important, like latency, reliability and affordability?**
8. **How can we achieve equity with respect to mobile services (voice, data and SMS) in regional, rural and remote communities and on regional and remote roads?**
9. **How can we ensure regional, rural and remote areas have access to the networks, equipment and capacity they need for improved household connectivity and to foster innovation and efficiency across regional industries, including for IoT applications?**
10. **The cost of building and maintaining telecommunications infrastructure in rural and remote areas can be a barrier to offering better services. What can be done to improve the fixed broadband options available to regional, rural and remote Australians?**
11. **Have you had experience with new or alternate service providers such as Starlink or WISPs? If not, why not? What additional measures would persuade you to consider new technologies?**
12. **What can be done to maximise access to multiple connectivity options in case of outages?**
13. **What can be done to increase capacity and improve the reliability of telecommunications services in regional, rural and remote Australia?**
14. **How can the energy and telecommunications sectors work more effectively, especially with respect to redundancy?**
15. **What innovative solutions can be explored to ensure telecommunications infrastructure remains operational during and after natural disasters? How could partnerships with local communities improve the maintenance, security and availability of infrastructure?**

16. **What lessons can be learned from private sector investment in regional telecommunications in closing the digital divide in regional and remote areas?**
17. **What has been your experience as a consumer of Australian Government programs aimed at improving regional communications? What improvements would you suggest?**
18. **What changes to Australian Government investment programs are required to ensure they are successful, efficient and effective in delivering improved, reliable and equitable telecommunications for regional, rural and remote consumers?**
19. **How could Australian Government programs better align with state, territory and local government planning and funding processes in delivering telecommunications services and infrastructure?**
20. **What other matters should the Committee consider in its review and why are they important?**

Appendix B – Terms of Reference

Terms of Reference for the 2024 Regional Telecommunications Review

1. The Regional Telecommunications Independent Review Committee must conduct a review of the adequacy of telecommunications services in regional, rural and remote parts of Australia.
2. In determining the adequacy of those services, the Committee must have regard to whether people in regional, rural and remote parts of Australia have equitable access to telecommunications services that are significant to people in those parts of Australia and currently available in one or more parts of urban Australia.
3. In conducting the review, the Committee must make provision for public consultation and consultation with people in regional, rural and remote parts of Australia.
4. In conducting the Review, the Committee is to have regard to any policies of the Australian Government notified to it by the Minister for Communications, and such other matters as the Committee considers relevant. The Minister requests that you have regard to the:
    a. awareness and impact of the government's $1.1 billion investment in improving regional communications, including the $656 million Better Connectivity Plan for Regional and Rural Australia, the extent to which this investment is addressing identified needs, and flexibility to address emerging needs and challenges
    b. implications of, and opportunities presented by, changing and emerging technologies and broader market developments for regional communications policy settings, and the design and delivery of regional communications programs
    c. attitudes of regional households, communities and businesses to: community awareness of access to supporting technologies to support take-up of, and public sentiment on changing and emerging technologies
    d. needs in First Nations communities and the extent to which those needs are being met, taking into account initiatives across Ggovernment
    e. potential to fast track some USO modernisation outcomes, particularly within NBN's fixed wireless network footprint, which would build momentum for broader change
    f. suitability of regional communications during emergencies and natural hazards, including reliability, resilience, speed and coverage.
5. Taking into account Terms of Reference Section 4, the Committee is to consider and provide advice on:
    a) telecommunications needs in regional Australia, gaps in services, and barriers to addressing needs, gaps and improvements in telecommunications outcomes
    b) changes or adjustments needed to existing government policies and design and delivery of programs to ensure they continue to be effective, remain fit for purpose, maximise the social and economic potential of regional Australia and existing and emerging technologies, and deliver improved telecommunications outcomes
    c) policy settings that might be needed to support more rapid rollout of, and investment in, new and emerging telecommunications technologies in regional, rural and remote Australia, or to address emerging issues
    d) constraints and capacity of the telecommunications providers to deliver investment and improved services to meet the needs of regional Australia
    e) the need for targeted place-based solutions, which may differ by region and remoteness.
6. The report may set out recommendations to the Australian Government.

7. In formulating a recommendation that the Australian Government should take a particular action, the Committee must assess the costs and benefits of that action.
8. The Committee must prepare a report of the review by 31 December 2024 or earlier and present it to the Minister for Communications.

Appendix C – Glossary

Term	Definition
3G, 4G, 5G mobile service	Progressive generations of mobile services
Asymmetric Digital Subscriber Line (ADSL)	A technology for delivering data transmission over a copper phone line using a signal splitter.
backhaul	The connection between an access node and a core network. For instance, a fibre cable running from neighbourhood exchange to the core network.
Closing The Gap	An Australian Government strategy that aims to reduce disadvantage among Aboriginal and Torres Strait Islander people.
copper network	A copper-based customer access network used to deliver standard voice telephony and ADSL services.
exchange	A node in a network where local consumer connections are aggregated and connected to the core network backhaul.
fibre	Refers to the glass cored fibre-optic cables used to transfer data between points in the form of pulses of light.
fixed line	Network design in which voice, data or broadband services are delivered over a physical line.
fixed wireless	Network design in which network connections are provided through radio signals between fixed antennas.
Internet of Things (IoT)	A concept that refers to devices such as sensors and machines which are connected to each other and the internet so that they are able to collect and exchange data.
latency	The time it takes a data packet to be transmitted from one point in a network to another, expressed in milliseconds (ms).
Long Range Wide Area Network (LoRaWAN)	A proprietary low-power wide-area network (LP-WAN) modulation technique. Power is conserved by keeping components powered downas much as possible.
Low Earth Orbit (LEO)	Satellite systems used in telecommunications which orbit between 200 and 2,000 km above the earth's surface and do not stay fixed relative to a position on the surface.
MNIPs	Mobile Network Infrastructure Providers
mobile roaming	The ability for a consumer device to connect to base stations which are not owned or operated by their mobile network provider (e.g. Telstra, Optus).
NBN (NBN Co Limited)	An Australian Government Business Enterprise established to build and operate the NBN.
network congestion	Where a network unit is carrying more data throughput than it can handle and service quality is impacted as a result. Congestion results in increased data transfer times, data packet loss and blocking of new connections.
Regional Tech Hub	An Australian Government initiative, delivered by the National Farmers' Federation in collaboration with ACCAN, to provide regional Australians with independent advice and support on phone and internet options and technical issues.
Sky Muster	A satellite internet service provided by NBN Co through the use of 2 geosynchronous satellites. Provides broadband internet outside of the Fibre network footprint.
Statutory Infrastructure Provider (SIP)	Carriers that must provide basic wholesale broadband services in the areas they service. This includes voice services if they operate fixed-line or fixed-wireless networks.

Telecommunications Industry Ombudsman (TIO)	A not for profit organisation that provides a free and independent dispute resolution service for small business and residential consumers who have an unresolved complaint about their telephone or internet service.
Telstra USO PerformanceAgreement (TUSOPA)	The Agreement which sets out the scope of services to be performed by Telstra in delivering standard telephone services and payphone services under the USO.
Universal Service Obligation (USO)	A longstanding safeguard that ensures all people in Australia can access fixed phone services and payphones regardless of where they live or work. Telstra is required to supply fixed voice services and payphones across Australia on reasonable request.
Wi-Fi	**A wireless local network protocol that operates using unlicensedspectrum in the 2.4 GHz and 5 GHz bands.**