2024 Regional Telecommunications Independent Review Committee

Western Australian Government Submission

Introduction

The Government of Western Australia appreciates the opportunity to make a submission to the Commonwealth Government Regional Telecommunications Independent Review Committee (RTIRC) for 2024.

The content of this submission has been informed by input from relevant WA Government Agencies and submissions and testimonies to the State Parliamentary Standing Committee on Public Administration Inquiry into Regional Telecommunications.

Overview

Telecommunications in Regional, Rural, and Remote Western Australia (RRR)

Due to the State's vast size, remoteness of many communities, and the costs involved connecting to the rest of the country and the rest of the world, RRR locations in Western Australia (WA) are particularly vulnerable to telecommunications disadvantage. Moreover, storms, bushfires, power outages, system malfunctions, and flooding commonly cause extended telecommunication network disruptions and service deterioration in WA.

While there is work occurring on the development of a national Public Safety Radio Network, progress has been slow. In May 2023, the Australian Government committed $10.1 million to establish a taskforce to drive the delivery of a Public Safety Mobile Broadband (PSMB) capability, led by the National Emergency Management Agency (NEMA).[1] However, more work is required through cooperation between the Commonwealth and the States to develop workable and reliable solutions to issues impacting regional emergency communications.

In regional towns with large influxes of tourists on weekends or holidays, the mobile phone network often becomes overloaded or congested. This can prevent retailers from processing payments and travellers from purchasing petrol or food from supermarkets. Accommodation providers may also be unable to accept payments from guests. These issues are not uncommon or occasional but occur regularly in remote parts of the State and small coastal communities that cater to many tourists.

To address these issues, substantial co-investments have been made by the Western Australian and Australian Governments and industry partners for telecommunications infrastructure, assets, and technology, with more needed to address lack of capacity.

Advances in technology (eg. Active Sharing) now permits multiple carriers to share infrastructure on mobile tower systems - delivering choice of carriers without compromising reliability - reducing power requirements, and in many cases permitting continuing operations of remaining carriers when the core network of a single carrier may have failed or is experiencing congestion. The Commonwealth, with cooperation from the States,

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[1] Release of the Public Safety Mobile Broadband Review and the Government Response | Department of Infrastructure, Transport, Regional Development, Communications and the Arts

should, where feasible, consider mandating the deployment of this technology to provide improved choice and drive competitive service improvements in regional mobile networks.

Interestingly, possibly due to the completion of NBN's Fixed Line and Fixed Wireless network, a significant increase in deployment of new State and Commonwealth funded fixed wireless services across regional, and the recent availability of new Low Earth Orbit (LEO) satellite services, most complaints about communications services since the last RTIRC review in 2021 are now directed toward mobile telephony services.

A response to the RTIRC Questions set out in the Issues Paper April 2024 is provided at **Attachment A.**

Summary of Issues and Recommendations

The WA State Government proposes that RTIRC prioritises and addresses the following issues:

Issue			Recommendations	
1	**Resilience**	Power availability, reliability, redundancy, and backup	1.1	The Australian Government declare telecommunications an essential service.
2	**Capacity**	Insufficient mobile telephone network capacity	2.1	The Australian Government reform legislation to ensure that active sharing of infrastructure is enabled.
			2.2	Government funding programs target increasing network capacity.
3	**Standards**	Absence of legally binding minimum network performance standards	3.1	Mandate performance standards for broadband services, including mobile services.
			3.2	Mandate standards for service provider coverage maps and develop a digital platform similar to the USA FCC (Location Summary - Fixed | FCC National Broadband Map).
4	**Disruption**	LEO satellite internet/direct mobile phone to satellite services	4.1	Undertake an impact analysis of the telecommunications industry of LEOs and direct to device services.
			4.2	Explore the potential benefits and implications of LEOs as part of a Universal Service Guarantee and Universal Service Obligation agreement.
5	**Inclusion**	First Nations digital inclusion	5.1	Government funding programs to target place based First Nations digital connectivity initiatives that enable communities to access, afford and effectively use digital technologies.

1. Resilience: Power Availability, Reliability, Redundancy, and Backup

Regional WA is exposed to severe weather events that result in frequent and extended power outages - a major contributor to extended telecommunication outages. These outages result in significant and prolonged disruptions to essential service delivery, business continuity, compromise personal safety and amplify personal hardship cases across the regions, especially among vulnerable cohorts.

Recent weather events impacting power and telecommunications include the January 2024 supercell thunderstorm which caused outages across 30 local government areas and 34,000 customers in WA's Wheatbelt and Goldfields regions bushfire-related outages in the Wheatbelt in 2022.

With similar events forecast to increase in frequency and severity, building the resilience of telecommunications infrastructure is essential in ensuring service continuity to meet the needs of businesses and individuals, particularly in times of emergency.

Most mobile towers are dependent upon grid power and are equipped with a supply of backup batteries designed to provide temporary power during grid outages. These backup batteries when new, deliver power for up to 8 hours, with some towers equipped with battery capacity for up to 12 hours. Until major network power upgrades (including a solution to pole-top fires) are deployed to regional WA to improve power reliability, mobile towers will continue to be vulnerable to network power failure.

In response to major outages across the State and the nation, all States and the Commonwealth Government have introduced financial assistance programs to 'harden' the power systems in mobile networks. While network hardening by supplying increased battery backup and generators to these tower sites will likely improve resilience to a degree, it will not accommodate for lengthy grid outages which result from cyclones or bushfires.

Automatic Power Transfer Units (ATUs) are available which could help address longer term outages. Telstra has deployed 200 ATUs across Australia, including 41 in WA.

Local Government Authorities (LGAs) and Emergency Services have also reported that the outages impact their operational ability to coordinate effort and respond to incidents. Most emergency services and local volunteer organisations rely on mobile and internet communications for logistical support, which can be unavailable during an outage.

Better network planning and identification of critical master transmission sites, which serve downstream capacity to other sites which are prioritised for power backup, redundancy and generator access could avoid the large-scale, long-term outages that have occurred in the past three years during major events.

More transparency from carriers which would require provision of information on the equipment used in individual sites, and the location of the nearest spares, could improve restoration times. An established protocol which carriers are required to follow to keep local shires and Regional Development Commissions informed of the specifics of current outages would improve community relations.

As an interim solution, consideration should be given to investing in more transportable Cells on Wheels or drone-based cells which are independent of the terrestrial telecommunications network and can be rapidly deployed to deliver temporary service during natural disasters or other major events. When the terrestrial network is down, they can provide limited ground coverage for mobile users. Wi-Fi hotspots connected to the core networks of Regional Internet Service Providers can also provide temporary internet connectivity and access to the mobile phone core networks via Wi-Fi calling capabilities.

Robust telecommunications are also critical for Western Power's management of electricity infrastructure, and its ability to effectively communicate with crews deployed to restoration efforts. Further, it is critical to the coordination required with other key players in the energy market, such as the Australian Energy Market Operator who maintains security and reliability of supply in the South-West Interconnect System (SWIS), to resolve power supply disruptions in a timely manner.

The Australian Communications and Media Authority (ACMA) has declared telecommunications an essential service. However, the Australian Government has not recognised this in legislation to align telecommunications with other essential services such as power, roads, and water for consumer protections and standards.

Recommendation:
1.1 The Australian Government declare telecommunications an essential service

2. Capacity: Insufficient Mobile Telephone Network Capacity

Mobile carriers express the services they provide as 'coverage'. That is, the locations where a customer's mobile device can detect a signal from the closest tower. While this measure does give some indication of the carrier's service area, it doesn't provide any indication of the ability of the tower to deliver a fit-for-purpose service to the consumer.

It is impossible to know whether the network has the capacity to adequately respond to demand. Without adequate network capacity, the isolated presence of a signal is of little value to consumers. Minimum performance metrics should be mandated.

Police and emergency services in regional WA rely heavily on the public mobile phone network due to limited radio range. Only 26% of WA is covered by either a radio network or a mobile phone network, leaving much of the State with minimal communications. This is a significant risk to police officers and community safety.

Issues include:
• Vulnerable persons cannot call 000 to seek assistance.
• The inability to contact emergency services (police, fire, medical) can lead to increased risk to vulnerable people/communities.
• Without telephones, individuals and communities can feel isolated, especially in emergencies when timely communication is crucial.
• Reliable mobile phone services are crucial for ambulance dispatch and communication among emergency services, especially outside metropolitan areas.

- In the absence of reliable communication channels, misinformation and rumours can spread rapidly, causing panic and fear.
- Prolonged communication blackouts can affect mental health, increasing feelings of anxiety, depression, and helplessness within the community.
- Humanitarian aid and disaster relief efforts are hampered without effective communication, slowing down the response and recovery process, which can exacerbate community tensions.

Indicators of insufficient capacity include (but are not limited to) low or inconsistent download and upload speeds; higher upload speeds than download speeds; call dropouts; variable coverage bars shown on the phone in the same location over time; network connectivity changing from 5G to 4G or 3G automatically in the same location; failed calls; and inability to load content when visiting internet sites.

The presence of these factors in many regional areas is a strong indication that consumer dissatisfaction with mobile network performance is a result of inadequate capacity in the mobile networks.

Upgrades to network capacity provided by carriers is often driven by the presence of competition. In regional areas where there is little to no competition, network capacity and performance are notably worse[2]. Active Sharing of infrastructure can provide competition.

Recommendations:
2.1 The Australian Government reform legislation to ensure that Active Sharing of infrastructure is enabled.
2.2 Government funding programs could be targeted towards increasing network capacity.

3. Standards: Absence of Legally Binding Minimum Network Performance Standards

While the Commonwealth Government regulates the telecommunications' industry, there is no minimum performance standard for broadband services in Australia for mobile or fixed line services. Mobile carriers argue that elements beyond their control, (eg. terrain, weather, foliage, etc.) make it unrealistic to mandate this; however, the recommendation should be explored. Consumers indicate a preference that the Commonwealth establish and enforce minimum standards for broadband and mobile services to ensure taxpayers receive value-for-money from taxpayer-funded telecommunications' infrastructure and to permit them to make informed choices about carriers.

A reasonable minimum performance standard for fixed broadband is 100 Mbps download and 40 Mbps upload. The USA Federal Communications Commission (FCC) recently declared that 100/20 Mbps is now its minimum specification for 'broadband'[3]. A similar

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[2] https://researchrepository.rmit.edu.au/esploro/outputs/journalArticle/Regional-mobile-telecommunications-performance/9922222261001341
[3] https://www.theverge.com/2024/3/14/24101313/fcc-new-broadband-definition-100mbps-20mbps

performance standard which includes a defined environment for mobile performance tests (eg. tests conducted 2 kilometres from the tower, with clear line of sight, etc. at different times of the day) could be implemented for non-fixed line services such as mobile phone towers.

The WA Government also understands the limitations inherent in coverage maps generated by computer-modelled prediction algorithms and software. Notwithstanding this, the mobile coverage maps available to the public do not accurately reflect actual coverage experienced by customers, nor are these maps the best representations of the coverage maps available to the carriers. There is often a significant disconnect between what is claimed and what is experienced, with the carrier maps often overestimating actual coverage.

Moreover, coverage maps provide no metrics for network capacity issues, which regularly affect service quality even in areas where the signal is strong, and coverage is available.

The prediction algorithms used by carriers can provide significantly more useful information than the applications currently available to consumers online. More accurate maps, using the detailed data available to carriers, could assist consumers with better and more accurate information.

Online coverage maps are consistently incorrect and can be 12 months or more out of date. Carriers should also be required to update their coverage maps at least monthly to give confidence to consumers that the maps they are using are current. This can create significant issues in regional areas and does not provide confidence to consumers that the maps accurately reflect current conditions.

Recommendation:
3.1 Mandate performance standards for broadband services, including mobile services.
3.2 Mandate standards for service provider coverage maps and develop a digital platform similar to the USA FCC (Location Summary - Fixed | FCC National Broadband Map).

4.   Disruption: LEO Satellite Internet/Direct Mobile Phone to Satellite Services

The recent availability of LEO based satellite services appears to have had a material effect on the take-up of broadband services in RRR areas as well as in peri-urban regions where NBN performance has been unsatisfactory. Starlink LEO services now claims more than 200,000 customers in Australia. The popularity of Starlink appears to be due to its reputation for higher reliability, higher speeds and higher responsiveness due to lower latency, when compared to the NBN SkyMuster satellite offerings.

Reports in RRR from customers using Starlink have been generally positive, with few complaints regarding reliability or speed. While the higher cost does not appear to be an impediment for most current customers, it does present a barrier to disadvantaged populations. Subsidies or other supports may be needed for more equitable access while

costs remain high; however, Starlink has recently (August 2024) announced a new consumer platform with a lower monthly subscription cost, but higher hardware cost, and a monthly data limit. New government funding programs could be focused in this area aimed at achieving affordability and digital inclusion outcomes.

At least 2 more LEO satellite services are expected to become available in the Australian market within 12 months.

While it is beyond the scope of this submission to exhaustively explore all connectivity options for RRR, it is worth noting that Lynk Mobile has entered discussions with Telstra and Starlink has announced a partnership with Optus to provide some level of RRR connectivity direct to handsets from LEO satellites, though it is expected that these services will initially offer only an emergency service level of capability.
Other providers, such as AST-Space Mobile and Airbus are currently trialling direct to mobile services from LEO satellites and High-Altitude Platform Services stratospheric gliders with AT&T in the USA and DOCOMO in Japan, respectively. This sector is expected to evolve rapidly, with more announcements in the next year, potentially offering a cost-effective solution to the large areas of WA where it is unlikely to ever be economically viable to deliver terrestrial mobile phone services.

LEO and direct to mobile services are impacting the telecommunications industry and will do so more in the future. Such impacts will need to be assessed in the context of future Australian and State Government co-funding regional infrastructure programs with a greater focus on affordability and digital inclusion outcomes.

The potential that LEO satellites could provide an almost universal solution to the dilemma of voice coverage for emergencies where there is currently no mobile footprint is an attractive proposition for governments. At no further cost to taxpayers for mobile blackspot subsidies to mobile carriers, LEO direct to handset services could potentially offer an attractive solution in the next version of a Universal Service Guarantee and Universal Service Obligation agreement.

Notwithstanding the availability of attractive offerings from multiple competitive LEO operators, the Australian Government should carefully consider the national sovereignty risks.

Recommendation:
4.1 Undertake an impact analysis of the telecommunications industry of LEOs and direct to device services.
4.2 Explore the potential benefits and implications of LEOs as part of a Universal Service Guarantee and Universal Service Obligation agreement.

5. Inclusion: First Nations digital inclusion

Commonwealth, State and private co-investment have markedly improved connectivity in WA's RRR schools, businesses and communities. Nonetheless, a significant gap remains in digital inclusion outcomes between Perth and WA's vast regional and remote areas, particularly in First Nations communities. According to the Australian Digital Inclusion Index, First Nations people living in remote communities are among Australia's most

digitally excluded citizens. There is no commercial incentive for network operators to invest in remote Aboriginal communities due to residents' inability to pay. The scale of investment required is beyond the capacity of the not-for-profit sector or regional local governments, so meeting the connectivity challenges in disadvantaged communities is wholly reliant on government support.

The WA Government has committed to eliminating the gap in life outcomes between Aboriginal and non-Aboriginal Australians under the National Agreement on Closing the Gap Outcome 17, which requires that 'Aboriginal and Torres Strait Islander people have access to information and services enabling participation in informed decision-making regarding their own lives'. The associated Target 17 requires that 'By 2026, Aboriginal and Torres Strait Islander people have equal levels of digital inclusion'.

Recommendation:
5.1   Government funding programs to target place based First Nations digital connectivity initiatives that enable communities to access, afford and effectively use digital technologies.

The WA Government response to the Committee's questions for the 2024 Commonwealth Regional Telecommunications Independent Review

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?***

The WA Government supports Commonwealth initiatives such as the Regional Tech Hubs, which have provided invaluable free (and independent) advice to private citizens and businesses in regional areas to improve digital literacy and promote uptake of broadband services.

Advice that is independent from individual commercial organisations is essential to ensure objective and unbiased education and guidance, and to ensure that consumers are aware of and have access to the choices available to them.

The WA Government supports Commonwealth funding to promote and raise the visibility of such consumer-facing organisations. A percentage of the existing levies on the telecommunications industry could be further allocated to ensure that all tiers of Australian society have access to free and unbiased information that increases digital literacy in the regions.

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?***

Beyond what is noted above, on-country and in-language support for First Nations communities is required. This could be achieved by strengthening existing community infrastructure such as Aboriginal Knowledge Centres, Community Resource Centres and libraries or through the establishment of Digital Hubs in selected communities.
Using an "Assisted Digital" approach, trusted mentors and trainers will be able to identify and address community concerns, providing the skills and knowledge to more confidently and safely operate in digital spaces.

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?***

The first step in addressing this issue should be an independent audit of the performance of the regional mobile network, as the Commonwealth government announced in 2023. The outcome of the $22 million allocated for the investigation and subsequent report should be made widely available and the audit should be repeated on a regular schedule.

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?**

Incentives for indigenous residents of remote communities to undertake technical training as telecommunications technicians, if successful, could deliver many benefits to RRR areas. Residents in these communities are close to the infrastructure, and if equipped with sufficient skills, qualifications, and tools to investigate and repair network faults, there could be significant benefits to both telecommunications providers and RRR residents.

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?**

The 2nd generation NBN Fixed Wireless network (now being deployed) uses technology known as 'Voice over New Radio' (VoNR) that is similar to a 5G mobile network, for voice communications. This technology could likely provide superior fixed services to 4G (VoLTE) technology--provided low band (eg. 700MHz to 900MHz) spectrum is employed.

Long-term fixed line customers have expressed scepticism whether any replacement wireless technology could provide sufficient confidence to allow removal of the existing traditional underground copper lines or dedicated High-Capacity Radio Concentrator (HCRC) wireless services which have been delivering terrestrial voice services since the mid to late 1980s throughout RRR Australia.

A common concern noted and yet to be satisfactorily addressed, is that voice communications via a wireless service such as NBN's Fixed Wireless network depends upon reliable *internet* connectivity. Without internet connectivity, even if the local wireless connectivity between the tower infrastructure and the customer premise is operating, there may still be disruptions to voice services because of internet connectivity problems deeper in the network which are not an issue for a public switched telephone network (PSTN) call.

Further, NBN Fixed Wireless services require the availability of either grid power to the NBN network devices at the consumer site or some form of reliable local indoor power such as a backup battery or generator if grid power has failed – not required for traditional copper fixed line services, or HCRC services where power is supplied from the local exchange or an independent outdoor solar/PV system external to and independent of the premise.

Fixed line service adherents are adamant that for them to have confidence in a voice service replacement of existing services, any replacement voice channel must be independent of the vulnerabilities of the internet, as the current copper fixed line and HCRC services are.

The number of customers in RRR Australia who remain on the HCRC network is estimated to be approximately 6,400. This number has halved in the last decade as alternative connectivity solutions have become available.

Nevertheless, thousands of customers in remote WA and the other Australian states continue to depend on this technology as their only option for voice connectivity. (Note that NBN has stated that while satellite internet may be available to almost all remote locations in Australia, SkyMuster satellite was not designed for USO-grade voice calls due to its inability to switch calls or to deliver International Telecommunications Union compliant latency).

The day may come even before the expiration of the current USO contract, that fixed copper lines may need to be retired from the telecommunications network, simply because the cost of maintaining them costs too much.

Given that the equipment is well beyond its end-of-life expectations and no longer manufactured, maintaining the HCRC wireless network beyond its current life will be even more difficult as spare parts to perform repairs are no longer available.

Identifying replacement service(s) for the existing USO voice arrangement that provide the same level of independent and reliable connectivity for voice communications remains an ongoing challenge. While the Commonwealth recently conducted Alternative Voice Service trials of new approaches to this issue, there have been no decisions for a way forward. Telstra has proposed that LEO satellites may be a viable replacement; however, many issues remain unresolved (see below, answer to Question 20).

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?***

Public telephones provide a communication access path of last resort for those unable to afford mobile phones or private internet – and in some remote areas where there is no mobile phone service available. Though Telstra reports call traffic on payphones continues to fall year on year, these devices remain an important means of connectivity access for social contact and safety in regional areas, not only for the economically disadvantaged, but also for emergency communications in remote areas where mobile phone service is non-existent or has been compromised due to natural disasters or other general power failures or where mobile phone towers are prohibited due to restrictions on radio transmissions.

Due to their widespread distribution, these locations with their connections to the core communications network could be enabled with universal Wi-Fi connectivity to enhance the delivery of USO obligations in regional and remote areas but are unlikely to satisfy the requirements of the core USO obligation of making a fixed line voice service available to any individual residence wishing to have one.

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?***

The determination of a minimum specification to qualify as 'broadband' speed should be an ongoing process for government (Commonwealth) informed by consumer needs and global competitiveness. This process should encompass regular assessments – at intervals such as biennially – to ensure that the defined threshold (including speeds) for 'broadband' remain relevant. Considering the increasing number of devices connecting to the internet in Australian homes and the escalating bandwidth requirements of content-rich applications, the currently accepted standard of 25/5 Mbps is insufficient to meet these evolving requirements.

The WA Government suggests that the standard recently adopted by the US Government of 100/20 Mbps[1], or even a more ambitious specification of 100/40 Mbps, recognising the need for more upload capacity, would be a more realistic specification for current demands. This specification is now recognised as a minimum requirement for applicants seeking grants from Federal programs in the USA to deliver broadband services in regional areas, a similar metric should be adopted by Australian programs.

Addressing latency and reliability is best approached through ensuring good network design and the provision of adequate network capacity. If governments mandated minimum standards for speed, capacity, maintenance practices, backup battery capacity per site, frequency of load testing of batteries and generators, this would largely obviate the need to set specifications for latency and reliability.

Due to the critical importance of the services hosted in private exchanges and mobile phone tower facilities, and the dependence of emergency services on those facilities for communications, minimum mandated standards should be considered.

Affordability is driven largely by the wholesale cost of acquiring capacity by the Retail Service Provider (RSP) from the infrastructure owner, the level of competition at a particular geographic area, profit margins and the levels of service available. NBN's published wholesale costs, recently agreed by the regulator, will make delivering profitable (and affordable) services in some RRR areas unlikely. Without government subsidies for monthly costs, the cost of delivering robust services and the ongoing cost of maintaining these services in RRR areas by RSPs will often render the retail cost for residents unaffordable.

While capital costs to deliver many of these services can be funded by government grants, there are no established or acceptable paradigms for subsidising operational costs (opex) for any period of time. Without a solution to this issue, many remote areas will not receive affordable services that can be maintained unless they are included under some form of legislated support, similar to the USO.

The Commonwealth government should consult with the States on how to address this issue, with a resolution provided for future funding rounds.

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?***

With the introduction of direct to device services in the very near future, mobile services will be available anywhere any time – however, affordability will always be an issue for certain sectors of our society, particularly First Nations peoples. Some degree of Government support will likely always be required.

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?*

The government should prioritise upgrading the majority of RRR sites to optical fibre FttP services where possible. A recent report by the ACCC has confirmed that FttP sites experienced fewer outages, had better response times, faster speed than other fixed line technologies such as FTTN, HFC, FttB and FttC.[2]

New, competitive optical fibre networks that could operate in RRR areas (eg. Vocus Horizon, WA Supernet, AARNet, etc.) should be encouraged and receive support and as necessary, eg. subsidies from government, to encourage optical fibre connectivity into RRR communities and direct spurs from these fibres to government offices, schools, businesses, and residences.

Commonwealth legislated minimum performance and minimum resilience requirements for regional communications infrastructure should be considered.

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?*

Optical fibre networks offer the most robust solution to fixed broadband but are not always practical or cost-effective to provide to every end user in RRR areas.

There is significant optical fibre deployed throughout RRR WA and prices have declined steadily over the past decade. However, the absence of competition on most routes in the RRR areas north of Perth permits the prices to remain relatively high compared to routes elsewhere, despite continuing price regulation by the ACCC.[3]

New, competitive optical fibre networks should be encouraged and if necessary, supported by government to increase competitive options for regional wholesalers, drive prices down for consumers and foster improved customer service through competition.

Several ambitious new optical fibre projects have been announced and are in various stages of development. These include a new national optical fibre network HyperOne[4], expansion of Australia's Research and Educational network AARNet, and Vocus' Project Horizon in Western Australia. Telstra has recently unveiled plans to modernise its intercity optical fibre network[5], a system that has been a cornerstone of Australian telecommunications for over thirty years. This will potentially benefit NBN fibre services and other customers.

Besides the retail availability of NBN optical fibre services, a multitude of Wireless Internet Service Providers (WISPS) have entered the market in regional areas. A combination of State and Commonwealth grant programs have provided subsidies to assist these and other organisations with expanding their coverage footprints beyond regional towns to last mile services to consumers into more remote areas of RRR.

The availability of new LEO satellite services offering carrier-grade backhaul for mobile phone tower sites (e.g., One Web) could also have a material impact on the affordability of establishing new tower sites for carriers that do not own their own fibre backhaul networks and for whom leasing of fibre backhaul from competitors has until now been unaffordable.

Three rounds of the Western Australian government's Digital Farms Grants Program will deliver high speed fixed wireless services across approximately 50% (100,000 sq km) of the Grainbelt region by the end of the year.

LEO satellites are now offering services which compete with fixed wireless and fibre-based services and direct to device services can potentially overcome infrastructure barriers.

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?

The WA government has supported many new Wireless Internet Service Providers (WISPs) providers through three rounds of its Digital Farm initiative along with co-contributions to the three rounds of the Commonwealth Regional Connectivity Programs. These grants have enabled high speed wireless capabilities that are providing broadband services that equal or exceed the speeds, reliability and overall performance of NBN services in metropolitan area.

The WA Government has trialled Starlink services for several years and if there is clear visibility of the minimum field of view required for the satellites, performance has been reliable, fast and without significant issues.

12. What can be done to maximise access to multiple connectivity options in case of outages?

Route diversity of optical fibre networks is the single most important infrastructure protection that can enable multiple connectivity options in the case of outages. Use of radio microwave links in some instances can mitigate optical fibre link cuts or failures. Backup power and power systems redundancy are significantly important. Regular testing of backup power systems such as batteries and generators is a critical component of reliable power. For government personnel and emergency services personnel, the use of e-SIM cards from multiple mobile carriers can provide a base level of voice communication redundancy. While the use of emergency roaming in the event of natural disasters can provide options, this approach is only viable where there is excess capacity available in all networks.

13. What can be done to increase capacity and improve the reliability of telecommunications services in regional, rural and remote Australia?

Network capacity issues and network congestion are amongst the most complained about telecommunications issues in regional Western Australia. This is especially true of the regional mobile phone networks.

As NBN has upgraded capacity to its fixed line and fixed wireless networks, complaints about capacity and network congestion in those networks are decreasing.

There are viable means of delivering significant improvements to network capacity and performance in mobile networks without providing access to additional spectrum.

It is important to recognise that while carriers with mobile spectrum rights enjoy equivalent access in both regional and metropolitan areas, the quality of service in regional areas often falls short. Despite similar access, these areas tend to experience higher levels of congestion, lower performance and reduced reliability in comparison to their urban counterparts.

Carriers have several options to reduce congestion on mobile networks. Additional sectors can be added to towers which permit a reuse of the same spectrum in different directions. This is commonly done in metropolitan areas or large regional towns by splitting the transmission into three 120-degree sectors, each of which will have access to all the spectrum available, effectively trebling the spectrum capacity of that tower. Another is increasing the backhaul to that tower to ensure that there is sufficient capacity between the tower and the core internet to meet the bandwidth requirements. The majority of RRR mobile towers are connected to optical fibre links, which can be upgraded by using higher performing equipment in the exchanges to deliver multiples of capacity for relatively small amounts of investment and without making any changes to the existing optical fibre.

Active Sharing models can further reduce energy requirements and deliver other benefits such as reduced energy consumption and enable competitive choice.

14. How can the energy and telecommunications sectors work more effectively, especially with respect to redundancy?

Increased cooperation between the energy and telecommunication sectors has the potential to significantly improve telecoms functionality in times of emergency.

The Commonwealth Government can capitalise on interjurisdictional interest by leading a working group to create a neutral virtual communications centre which permits the sharing of network status data between mobile carriers and power providers across all mobile towers and backhaul infrastructure and all energy networks.

This cooperation could lead to a virtual network command centre which permits a transparent view of the status of network assets across all carriers and power providers. Information from this network could be used to inform consumers, the media, businesses, and governments of where infrastructure has failed and to plan for recovery and restoration more effectively. Sharing and redundancy of connectivity would permit outages from one carrier to be shared with other networks that are still operating.

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?

Natural disaster resilience for telecommunications infrastructure is largely a matter of ensuring the availability of local power supply either from the grid or from stand alone or back up power systems on site at each facility.

Despite cyclonic winds and bushfires, damage to telecommunications infrastructure itself is rarely the cause of outages during natural disasters.

Historically, during extended outages, many Wireless Internet Service Providers (WISPs) have continued to operate without interruption and provide invaluable connectivity to the community when the mobile phone networks have failed due to insufficient power backups.

Some WISPs have set up free Wi-Fi hotspots in the centres of small communities to permit residents to access Wi-Fi calling and use the internet to contact families and loved ones.

Coordination between mobile carriers and local governments to share resources for generator refuelling and when necessary, generator restarts – could significantly improve mobile phone tower reliability following extended grid power outages from natural disasters.

Consideration of the installation of radio repeater equipment with independent power on existing mobile and shire-owned towers should be investigated to provide an independent channel of communication for emergency services for HF, VHF and UHF Land Mobile Radios.

16. What lessons can be learned from private sector investment in regional telecommunications in closing the digital divide in regional and remote areas?

Private sector investment in regional telecommunications will occur only when there is sufficient market interest to generate income from services that will warrant investment. Government subsidy programs (and legislated protections such as USO and USG) have been effective at addressing 'market failure' in many areas, however, as the landscape continues to evolve so quickly, the infrastructure requirements to maintain digital equity between metropolitan and RRR become more costly.

The emergence of foreign-owned LEO satellite services has been a welcome addition to RRR areas where other commercial and government provided services are inadequate and these services further serve to reduce the metro/RRR digital divide—but only for those able to afford the cost of these services, which remain more costly than equivalent grade services available to metropolitan and suburban customers.

While there remains a gap in this affordability for RRR residents, the digital divide will remain.

To-date, no government programs have proposed or seriously considered subsidising connections to LEO services to level this digital divide and affordability gap, although such programs are currently under consideration.

Private subsidies of terrestrial (Australian-owned) broadband networks have been successful in providing wireless broadband services in all Australian states and territories. However, the cost to taxpayers has been significant, and these costs have been questioned considering the now-available LEO services, which have become available as an alternative throughout RRR without taxpayer subsidies.

Suggestions have been made to the Australian government to consider replacing existing USO/USG services provided by terrestrial networks with LEO services. Though this approach may be technically viable, the Australian Government must consider the implications of allocating a legislated guaranteed service to a foreign-owned service provider over which they have no sovereign control.

17. What has been your experience as a consumer of Australian Government programs aimed at improving regional communications? What improvements would you suggest?

The provision of LEO and potential direct-to-device services will require a re-assessment of these programs. The WA Government together with the other jurisdictions is providing input into current reviews of the programs.

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?

The WA Government is developing a State Digital Connectivity Plan that will provide a framework to guide and influence strategic, long-term investment so that all WA citizens and businesses have appropriate access to the infrastructure and equipment they need to fully participate and compete in an increasingly digital world. This will include a particular focus on the needs of RRR 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?

A new model of Australian Government programs, which is currently been discussed, could be developed utilising the Federal Funding Agreement Framework, similar to other essential infrastructure, focused on Jurisdictional priorities in bridging the digital divide.

As mentioned above, the WA Government is currently developing a State Digital Connectivity Plan incorporating an investment prioritisation framework which can be used as the basis for future co-funding programs.

20. What other matters should the Committee consider in its review and why are they important?

LEO satellite constellations have received significant attention since the launch of the first Starlink satellites three years ago. The Department of Primary Industries and Regional

Development trialled Starlink services for two years in both fixed and mobile applications and found the services to be relatively consistent, reliable, and capable of delivering high speed services when fixed or mobile and in locations where no terrestrial services were available. Few outages were experienced when the Starlink dish had unobstructed access to the necessary section of sky for satellite connectivity.

Recent feedback from Australian users suggests that as the Starlink network expands with more active customers, fluctuations in download and upload speeds have been observed. To maintain service quality, Starlink is thoughtfully coordinating new customer activations with satellite launch schedules. It's important to note that Starlink's residential services do not come with guaranteed Service Level Agreements or fixed response times for service inquiries. Support for residential customers is handled via email, directly from Starlink's technical support team based in California, USA.

Starlink has recently signed agreements with several Australian service providers who intend to market and support Starlink from Australia. These wholesale providers will presumably have some form of priority access to Starlink support in California that permits Service Level Agreements with Australian customers and be capable of making commitments to minimum service levels for response times.

Beyond Starlink, the OneWeb LEO satellite constellation is also now offering services in Australia, primarily targeting business and government customers with higher guarantees of performance and service, along with higher retail prices. One Web is also employing Australian-based service providers as wholesale intermediaries to market, install and provide service and support to Australian customers.

By the close of 2024, Amazon Kuiper LEO satellites will also offer services in competition to existing LEO satellite operators. Amazon is further suggesting to the Australian government that its services can replace the existing terrestrial infrastructure now used to deliver basic Universal Service Obligation voice services as well as offering nearly universal broadband services in regional areas.

Amazon has provided a statement to Infrastructure Australia in the context of Universal Service Guarantee update considerations that details what is known as of April 2024.[6]

This submission suggests that Amazon will be broadly targeting all customer segments. Amazon claims that its Project Kuiper will operate as an internet service provider, serving individual households, as well as schools, hospitals, businesses, government agencies, and other organisations with three discreet hardware platforms.

Furthermore, Amazon claims its Project Kuiper is equipped to support voice products, leveraging its low-latency capabilities to deliver call quality on par with current terrestrial networks. It also meets the network demands of other carriers by providing backhaul services that can help extend and in-fill their own fixed and mobile terrestrial networks to new service coverage areas.

[1] The FCC Quadrupled the Definition of Minimum Broadband Speeds. Here's Why It Matters - CNET
[2] Fibre to the premises delivers most reliable broadband connection | ACCC
[3] Final report - DTCS and fixed line services | ACCC
[4] HyperOne - Connecting the future of Australia
[5] Intercity Dark Fibre Network - Telstra InfraCo
[6] bdus2024-amazon-kuiper.pdf (infrastructure.gov.au)