2021 Regional Telecommunications Review
Secretariat
Department of Infrastructure, Transport, Regional
Development and Communications
GPO Box 594
Canberra ACT 2601

Date   30 September 2021
Reference   Regional Telecommunications Review 2021

By Email: secretariat@rtirc.gov.au

Internet Australia welcomes the opportunity to engage with the Regional Telecommunications Review each year in which the review occurs. While significant improvement in non-urban communications capability has undoubtedly been made over the past decades, the increasing demand for higher capacity and more reliable services due to the ever-increasing integration of digital technologies in our daily lives has meant that regional, rural, and remote residents and travellers are still disadvantaged compared to urban counterparts.

Digital applications pervade modern society and are continuously increasing their demand for traffic. Streaming media, digital entertainment at increasing video resolution, cellular apps on increasingly powerful devices, real-time navigation, and real-time cloud-based business technologies are designed by their providers with assumptions around the types of communications links that will be used by the consumer or business. These assumptions are calibrated to the provider's expectations of links available to the majority of their users, which inevitably means urban city environments. Designers of web-based apps make assumptions about the speeds of modern fixed line and cellular networks when choosing the size of images and animations within their apps. Modern web-based systems and cloud-based systems assume connection speeds of at least tens of megabits per second, mostly unlimited data caps, and round-trip latencies of less than 30 milliseconds, whereas a decade ago such applications might have assumed only DSL-relevant characteristics of at least a few hundred kilobit-per-second capacity, and much the same latency.

These developments cause non-urban traffic demands to evolve as fast or faster than improvements can be made in infrastructure and services – increasing traffic demand that is mostly not in the power of the user to control. If new infrastructure and services are merely designed to satisfy requirements at a particular time, such as identified by past RTIRC enquiries, then by the time the infrastructure is funded, installed and commissioned it is almost inevitably inadequate for the evolved requirements at the later time. Non-urban users, struggling with technologies and networks

internet.org.au
@internetAUS

PO Box 1705
North Sydney, NSW 2060
Australia

General enquiries: info@internet.org.au

providing less capable services or built to satisfy requirements that might have been adequate a decade ago, will still struggle to be able to access modern Internet-based systems.

Internet Australia has a long history of interest and providing advice to government on this and related matters for decades, including advocating for Internet services to be covered by the Universal Services regime, submissions in recent years in relation to the Regional Broadband Scheme, and on performance standards for the NBN and Retail Service Providers which should apply in non-urban areas just as much as they apply to urban areas.

Our considered responses to this inquiry's questions have been shaped by several members who are directly impacted by the challenges of living, working, and communicating in regional, remote, and rural areas, and who have provided anecdotes and case-studies from direct lived experience. We would be happy to expand on these responses more fully, as well as any other aspects of our submission, to the Inquiry members directly. We particularly acknowledge the contributions to this paper of Fionn Bowd, Jann Karp, and Cheryl Langdon-Orr, and their contacts sharing their experiences and insights.

About Internet Australia

Internet Australia is the not-for-profit organisation representing all users of the Internet. Our mission – "Helping Shape Our Internet Future" – is to promote Internet developments for the benefit of the whole community, including business, educational, government and private Internet users. Our leaders and members are experts who hold significant roles in Internet-related organisations and enable us to provide education and high-level policy and technical information to Internet user groups, governments and regulatory authorities. We are the Australian chapter of the global Internet Society, where we contribute to the development of international Internet policy, governance, regulation and technical development for the global benefit.

Sincerely
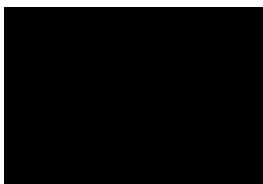
Dr Paul Brooks
Chair – Internet Australia

Submission by Internet Australia

Consultation Paper – Regional Telecommunications Review 2021 (2021 RTIRC Review)

Introduction

Communications in regional, rural and Australia has always lagged behind the communications technologies available in metropolitan areas. In response to the growing digital divide that was evident in 2005 the Government mandated that an inquiry be held every three years into 'the adequacy of telecommunications services in regional, rural, and remote parts of Australia'. The concerns that were expressed about communications outside of metropolitan areas in the first Regional Telecommunications Independent Review Committee (RTIRC) report are very similar in emphasis to those which are being raised in this latest inquiry: connection and fault repair times for fixed line services and access to affordable broadband services.

Despite the efforts of governments in responding to a succession of RTIRC reports over the past 15 years, there continues to exist a patchwork of broadband connectivity in regional Australia which constrains the activities of businesses both small and large, and the abilities of residents to effectively access systems and services that urban dwellers take for granted – for instance (and highly significant in these past two years) many non-urban students are still unable to effectively participate in home schooling.

Reliable and dependable data communications networks are essential for people and businesses throughout the country. Consumers and businesses must be able to be confident that services will be installed, connected and made available in a predictable timeframe, have predictable and adequate and (importantly) warrantable capability with recourse for rectification if a service does not meet required standards. Once operating, customers must have the confidence that a failed service will be rectified swiftly, or otherwise customers will be forced to waste funds on backup services and secondary capabilities that should not be required. These requirements are even more urgent in non-urban areas where there may not be any viable backup or alternative service, and the travel times to access alternatives are more often prohibitive.

This patchwork of service types and qualities frequently compels users in regional and rural areas to be predominantly forced to use satellite-based services, which are frequently congested, and cannot reliably support video conferencing for work or education. The recurring problem of NBN satellite congestion must be addressed. Satellite services on NBN are also constrained with data volume cap limitations – NBN wholesale satellite plans, unique to the NBN satellite network, are limited to a low data allocation during peak times, preventing affected communities from communicating effectively during the times that most people need.

With regard to businesses, this has the effect of limiting, or even eliminating, the capacity for those businesses to effectively engage in the digital economy. Particularly when combined with patchy and unreliable mobile phone coverage, this can leave regional businesses with unreliable or limited communications access – all too frequently businesses in regional areas have to put up with loss of connectivity for hours, often days and even weeks at a time.

Our response to the questions asked in this RTIRC inquiry will be in five parts:

- What services are in place now, and what is needed to fix or improve the services (questions 1-5 of the Discussion Paper)

- More particularly, what issues are raised and need to be addressed in light of COVID 19 (Question 6 of the Discussion Paper)

- What policies and/or practices should Government do to address the issues (Questions 7, 8, 11, 12, 13 of the Discussion Paper)

- What new technologies could address the communications issues (Questions 9, 10 of the Discussion Paper)

- What information should be readily available on communications services (Questions 14, 15 of the Discussion Paper)

1   Existing Regional, Rural and Remote Communications (Questions 1, 2,3, 4, 5)

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

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

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

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

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

1.1   Fixed-line broadband services

The Government's decision to change the roll-out of the National Broadband Network based upon deployment of Fibre-to-the-Node instead of Fibre-to-the-Home (with battery back-up) has disproportionately impacted regional and rural Australia. Speeds available with this technology are significantly less than the speeds available in metro areas, as the speed of VDSL2 signals is highly dependent on the length of the legacy copper telephone wires, and country areas naturally have longer cable paths on average than urban areas. Earlier this year in its 2021 *Measuring Broadband Australia* report, the ACCC reported:

> *Fibre to the node services continue to account for the bulk of the impact from underperforming services across both the NBN50 and NBN200 speed tiers.*[1]

Further, the lack of battery back-up in the modern NBN network has left regional and rural Australia with less reliable access to communications than they had previously when all fixed addresses had a copper phone line. The old style copper-based phone service incorporated its own power supply, whereas phone services delivered over the NBN or most other broadband networks do not. This means regional Australians are frequently **less safe in an emergency** than they were before the NBN was rolled out. Particularly in cases of emergency, if properties still had maintained copper line access, many residents would still be able to make fixed line calls as long as their 'lead in' cable to the house was undamaged and the street copper line was underground, as it frequently is buried in regional and rural areas.

Fixed telecommunications networks are now completely reliant on the availability of reliable electrical power, both for the user terminal as well as the network equipment in the street or the exchange. This is a challenge in regional and rural communities where the grid power supply is considerably more fragile and prone to outages than urban areas.

---

[1] ACCC, *Measuring Broadband Australia: Report 14, August 2021, p. 22*

A power failure is precisely the time when it is most likely that a resident may need to communicate, perhaps to look up whether the area affected is local or widespread, but when the communications equipment relies on grid power, that option is not viable.

When the power fails in a regional/rural/remote community, such communities rely even more than urban dwellers on communications to call for assistance. Travel times are longer, and in emergencies it may not be feasible to drive to get assistance. For example, rural households and hotels typically have larger freezers and refrigerators than urban dwellings to hold food supplies for longer periods due to the distance to travel for supplies. For example, in a power failure, the householder may need to call a neighbour to borrow a generator.

By creating this dependency and making modern communications infrastructure so integrally reliant on local electrical grid reliability (including the home or store local terminals) and unable to operate if the power is off, telecommunications network infrastructure providers in regional and rural areas have *decreased* the reliability of communications.

Internet Australia submits that telecommunications infrastructure providers (such as the NBN) be required to provide a backup battery capability with every home user terminal, irrespective of the NBN technology provided to the premises.

1.2   (Lack of) Prevalence of alternative services

It is common for people located in metropolitan areas - including government and regulators - to consider cellular mobile coverage to be ubiquitous, and say that if a broadband network is not performing well, the end-user can simply switch to a mobile service. Or if the fixed-line telephone is not operating, a user can simply switch and use a mobile handset instead. Urban students and businesspeople are familiar with 'hot-spotting' or 'tethering' their laptops and other devices with their mobile handset to use the cellular network for an Internet connection.

This is not a reasonable view for regional and rural communities where the reliability of a mobile signal (if one exists at all) is often linked to the reliability of a fixed-line broadband service, as they both rely in the same underlying optical fibre or microwave radio backhaul cables, and on the same electrical grid – if one network is down, the other is likely to be down as well. In many rural/regional areas there is insufficient or no cellular mobile coverage for this to be a reasonable alternative, yet this is the 'one size fits all' alternative service that national providers offer across the country - in regional areas as well as urban areas where such an approach might be thought reasonable. In many regional and remote communities a satellite-based solution would be a more effective alternative or interim service, however providers don't offer such an alternative. The net result is that regional customers with an unreliable fixed-line service often have no access to any viable alternative or interim service, while waiting for the main service to be restored – unlike customers in urban areas, regional customers often have no viable safety-net to fall back on.

Unlike urban areas, in regional and rural Australia, there is frequently no viable alternative communications network when the fixed-line network or mobile network is 'down'. This requires

greater attention and higher importance by providers and Governments be placed on reliability, redundancy and self-contained backup power solutions for communications networks to 'ride through' power problems, backhaul cable problems and other events that might cause network outages.

1.3 Time to Repair and urban/non-urban parity

In regional and remote areas it is commonplace for home phone and internet services to be down regularly. This occurs not just during disasters, but often simply due to weather conditions in areas with marginal coverage, or during storms cutting off satellite communications. Where a service develops a fault, regional Australia also suffers from disproportionately long repair and replacement times. In rural areas it is not uncommon for NBN technicians to take up to four working days to be able to assist, whereas in urban areas NBN's Service Levels for fault rectification is '5pm Next Business Day'[2].

An equally important issue for regional and rural Australia is the broadband speeds available. As people are increasingly choosing to live and work outside of urban areas, available fixed line broadband speed provided by the Statutory Infrastructure Providers (SIPs – usually the NBN) and the speeds they provide are increasingly important.

As Internet Australia has argued in its response to the Department's Consultation Paper on Statutory Infrastructure Providers (SIPs), the proposed 'broadband speed standards' for SIPs are wholly inadequate and should be completely re-drafted. This applies to urban areas as well as non-urban areas, but the importance of availability of dependable and consistent network performance and throughput is even higher in regional, rural, and remote areas. Under the proposed SIP performance standard (which would apply in regional and rural areas), a 100Mbps or more nominal peak service would not need to reach more than 50 Mbps at any time and would only need to reach 50 Mbps at one time in a day, and at any other time the service would be acceptable if it passed some data no matter how little, as long as the service didn't stop completely.

Networks in regional and rural areas are likely to be disproportionately impacted by network slowdowns at the infrastructure provider, due to less redundancy and higher cost in backhaul links creating an incentive to operate backhaul links at or close to congestion to regional areas from the main city datacentres that form the hubs of modern service-provider networks. Laughable broadband performance standards such as the proposed SIP performance standard leaves open the likely consequence of services in regional and rural areas failing to achieve the speeds and performance that a reasonable person would expect and would be expected in urban areas, but without any recourse to open a fault complaint as it would fall within the levels deemed acceptable by the standard.

---

[2] NBN SFAA – WBA – Service Levels Schedule, Section 8, pp14-15

1.4   Recommendations for fixed-line services:

- In regional/rural/remote areas, user terminals (such as the NBN satellite receiver and NBN fixed-wireless receiver) should be supplied with battery-backup for at least 4 – 8 hours to remove the dependence on grid power for communications.
- The battery-backup module should be supplied with a USB socket, so that in an extended power failure the resident could keep a mobile phone handset charged to maintain cellular communications in those areas where they exist.
- For areas with little or no mobile coverage, RSPs should provide access to a satellite service as a temporary communications solution while the fixed line or fixed wireless service is being repaired.
- SIPs must ensure that at least 90% of eligible services in an area meet the peak speed standard and there should be no allowance for slow-down in peak times.

1.5   Satellite Communications

NBN Co launched the Skymuster satellite service in 2015 as part of its obligation to provide services where fixed line or fixed wireless aren't available. Costs are between $35 to $70 per month, similar to urban-area Internet services, however the NBN satellite services have unique restrictions that are not present in other technology systems used in urban areas. Almost immediately upon opening of the service, it became congested due to inadequate forecasting of demand. NBN Skymuster services have the concept of 'off-peak' and 'peak' data cost times. Off peak usage is cheaper, but far less convenient as it is defined as between midnight and early morning. There are also data caps on basic offerings, clearly limiting satellite usage for education and business uses. Urban dwellers, not restricted to the satellite-based services, are not subject to these restrictions.

1.6   Recommendations for Satellite services

- The recurring problem of congestion within the satellite network must be addressed by reducing the number of premises forced to use satellite, through extending the fixed-line network into satellite-served areas

- Skymuster plans are complex and confusing, and must be simplified

- Skymuster should update capacity to meet demands for increasing use for education and business purposes

1.7   Cellular Mobile Communications

Geographic and economic constraints have prevented mobile coverage from effectively or reliably 'filling in' for the gaps in broadband connectivity or providing an alternate service. As well as the well-known gaps in the reliability of mobile phone coverage for telephone calls, this means that sufficient data for internet use including video calling is not reliably available, particularly in regional and rural Australia.

Businesses large and small across the nation are increasingly adopting a low-cash economy and using electronic terminals to accept payments. This has accelerated in the past year due to COVID-19 advice recommending or even mandating electronic payments instead of cash through 'tap and go' card payment terminals, even for very small transactions, to avoid physical handling of cash. These cash terminals generally rely on a cellular mobile signal to communicate with the banking institution, with the result that businesses in regional and rural areas are increasingly finding themselves unable to receive payments when the cellular mobile network is down or signal is too weak for the payment terminal to function.

There are many industries where electronic card payment is virtually mandatory, such as the road transport industry. At fuel stations/roadhouses in small regional and rural towns, much of the income is from commercial trucking, who mostly must use a corporate-issued payment debit or credit card to pay for fuel – with the high cost of full tanks of diesel fuel for a road-train semi-trailer rig, cash is not viable.

Without a reliable cellular mobile signal for the card payment terminals, these and other similar regional businesses cannot function. In practice, this means that businesses are unable to reliably integrate payment gateways to their online stores/accounting/booking/ reservation systems. Consequently, the latest innovations in digital marketing and tourism are not able to be utilized.

The payment-terminal example identified above is one of many examples where reliable fixed-line communications, and reliable mobile communications, are not interchangeable. Payment terminals working over a cellular signal cannot be simply redirected to work over a fixed-line broadband connection when the mobile network is offline. In modern society, both must be available, and reliable, for many business and personal activities that urban dwellers take for granted.

In urban areas there are usually multiple towers and base-stations within range, so an outage of a single tower doesn't usually have much impact; – a handset or terminal will simply re-direct to another tower. In regional and rural communities however, that fail-over function is not available. Consequently, the reliability of each rural and regional cellular mobile tower is significantly more important than towers in urban areas.

This is compounded by the lack of mobile roaming arrangements between networks – a terminal with one carrier's SIM cannot use another carrier's signal when the first carrier's network is not available.

In regional, rural and remote areas, mandated roaming between cellular networks when the subscriber's main carrier is offline would have significant benefits to communities and travellers including:

- 1)   Improved reliability of service, when a second network can be used if the first network is offline or weak signal – which translates to improved safety when a call or message is needed in an emergency;

- 2) Improved competition, as it will no longer be so critical for a subscriber to have to consider which singular network has the best coverage in every location the subscriber may wish to visit; and

- 3) Reduced burden on the consumer by avoiding the need to evaluate complex coverage maps, which cannot take into account local conditions that may block a signal such as indoors coverage

The Regional Mobile Black Spots program has been invaluable in providing significant enhancements to mobile phone infrastructure in regional Australia. However, and almost inevitably, the initial rounds of this program will have been frequently employed to fund the establishment of phone towers in places which were marginal from a commercial perspective. Successive rounds of the program are likely to have been used for towers in areas which were of diminishing commercial attractiveness. The challenge now will be to address the communications needs of the most marginal markets for these services – the utility provided by further rounds of the Regional Mobile Black Spot program is diminishing.

It is not obvious to us that further extensions of the Regional Black Spots program and the Regional Connectivity Program are the best way to go about improving cellular mobile signals. This is because, over time, we are now trying to address mobile blackspots in those areas which are most marginal from a commercial perspective. For these areas, competitive processes for grant selection are likely to guarantee that such areas never qualify for blackspot funding. For these areas, the key policy challenge is to determine how best to meet these needs. More targeted, non-competitive grant programs seem to have some merit in addressing the communications needs of these areas. In addition, it seems more likely that new technology solutions could yield better outcomes in the most marginal areas, and these should be explored further by the committee.

1.8   Recommendations for Cellular Mobile services

- Mandated roaming between cellular networks when the subscriber's main carrier is offline would have significant benefits to communities and travellers.:

- The committee should consider the development of a new, non-competitive grants program to augment the good work that has already been achieved by successive rounds of the competitive mobile blackspots program and the Regional Connectivity Program.

1.9   Impact of Emergencies

A recurring challenge confronting people who live in remote, densely forested parts of the country is loss of mobile phone coverage during bushfires. This arises because of congestion of service, combined with loss of infrastructure through the destruction of the telephone towers and equipment or, more frequently, the power supply infrastructure supporting those towers.

In emergency situations such as recent bushfires, lack of ability to keep a mobile phone charged, and the importance of charging ports in community shelters, was highlighted as a significant factor in affected people being able to keep in touch with rapidly changing instructions and situational awareness. This simple supply of USB socket in an in-home small battery backup unit suggested earlier in this paper could significantly alleviate this challenge in such communities.

In response to this danger, providers of mobile phone services normally depend on the provision of back-up diesel generators to provide emergency power to remote mobile phone towers. The major limitation on this solution is that the back-up fuel supplies are limited, and once exhausted leave the towers without electricity. Roads blocked by fire fronts and fallen trees make this difficult to remedy.

Tower operators also used mobile telephone broadcasting systems known as COWS (Cells on Wheels). The experience of the south coast of NSW in last January's massive bushfires suggests that neither of these options provides any sort of comprehensive solution to provision of mobile phone services in fire devastated areas. In many instances, power supply infrastructure was so badly damaged as to require weeks or even months for repair. At the same time, dangerous road conditions often precluded supply of back up diesel even where the towers themselves were undamaged.

This means that at a time when regional Australians have never felt more vulnerable to extreme weather events, the structure of the NBN as FTTN instead of FTTP (with battery backup for power outages) and the forced cutover to the NBN, has left regional Australians at risk of dangerous isolation during natural disaster through loss of power causing a resulting loss of communications.

For example, in June 2021, 56,000 properties were left without power due to extreme storms in the Dandenong Ranges in Victoria. The Dandenong Ranges are part of metropolitan Melbourne and are only 35km from the Melbourne CBD, however the area is also classed as 'rural' under the Federal electorate categories. The Dandenong Ranges are also a very high bushfire risk zone, with fatal bushfires occurring in 1997, 1962, and earlier.

During the recent severe storm in this area, many properties in that area had no communication with the outside world during and following the storms, with even the 'SOS' mobile access unavailable for days due to extensive damage to the mobile network. Many residents were physically trapped on their properties due to downed trees and were not reached for six days by emergency services. Fixed communications network lines were down until crews were able to install mobile generators into every street NBN node and restore power at the local exchanges, which occurred three to seven days following the storm. However, without a home portable generator, households could not access their fixed line or internet, as the home user terminal requires a generator to work if there is no power to the socket. Thousands of properties remained without power until 3 weeks following the storms. Emergency crews fear further fatalities if lessons are not taken from this recent Dandenong's storm.

In theory residents and businesses would still have access to the mobile phone service, however the nature of natural disasters is that frequently mobile phone services (which are not available or reliable in all regional areas in any event), are also disrupted by the natural disaster. Mobile phone towers or the power that they require can also be disrupted by fire, flood and extreme storms. Even when the danger has passed, access to the towers for repair may be unsafe, leaving towers out of commission for days.

A further issue which the committee needs to consider is the possibility of providing central emergency and post emergency communications centres for rural and regional communities. An example of a partial solution arises from the recent bushfires in the King Valley region in North-Eastern Victoria. As a resident of the area noted to us:

> "As part of emergency infrastructure to townships during the fires, things like generators and water are made available at a central location. For example, the recent fires in the King Valley, Cheshunt Community Hall were successful in receiving a grant to buy a generator for the local hall. It would be great if the internet was also considered an essential piece of infrastructure that could be fixed to small village halls. This would provide emergency options for residents to communicate with family, work and study and also local businesses to still continue to operate."

To Internet Australia, this suggestion seems obvious. But it is so obvious that governments do not appear to be doing it in any concerted fashion. It is high time that they did.

Regional and rural residents have often experienced extended mobile unavailability during a disaster, which is precisely the time when they need to call a family member to provide a status update, to coordinate an evacuation route, to find out conditions ahead, or use a mobile broadband data capability to look up information. Lack of access to up-to-the-minute information, and lack of communications in general once a person has left a building, has resulted in loss of life and property that could have been prevented if emergency backup temporary cellular network capability could have been rapidly deployed. Lack of such communications after a disaster can continue to make such an area unattractive to continue to live in, or for new people to feel safe to move into the area, affecting the economic future of the area long after the disaster has passed.

In these circumstances, it seems appropriate to consider the use of other technologies to provide temporary access to mobile phone services. Examples that could repay further consideration by the committee would be the provision of emergency phone access via airborne systems which could employ long loiter times over areas where the fire front has passed by. Options could include drones, manned aircraft, unmanned tethered balloons and manned balloons such as airships. Internet Australia acknowledges that each of these options has advantages and disadvantages, however the critical point to be made here is that each of these technologies has the potential to provide temporary mobile phone and broadband services in disaster devasted areas at times when existing technologies are likely to provide little or no coverage for days or even weeks at a time.

The mere existence of such solutions, even if not deployed, would provide comfort and reduce anxiety to residents that viable backup options would be available, making the entire community more attractive for existing and new residents alike to continue to live there.

1.10   Recommendations related to Disasters and Emrgencies

- Designated Community Shelters should be supplied with charging ports for mobile devices
- Central communication locations such as village halls should be provided with robust Internet connectivity, including wide-area open WiFi
- Consider provision of emergency phone access via rapidly deployable airborne systems until main infrastructure is repaired
-

2   Impact of COVID 19 (Question 6)

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

A significant impact arising from Covid-19 related lockdowns, particularly in regional NSW and Victoria has been to highlight the inequality of service available to school students in many regional areas. This has meant, for example, that school students do not reliably have sufficient bandwidth to attend 'zoom' classes when scheduled, or to participate in other activities that require video or other high bandwidth activities when required to learn from home.

Government needs to recognise that the impact of Covid-19 on the lives of all Australians has been a major game changer with respect to how we go about most aspects of our daily lives. The significant surge in demand for broadband connectivity and the use of mobile data in regional and remote areas of Australia is a direct outcome of the increase in the use of home schooling, the increased reliance on online purchasing, and working from home. These changes in the way we go about learning, working, and consuming are leading to substantial changes in behaviour and a growing tendency for affluent, knowledge workers to permanently move to regional areas. The combination of these factors is placing increasing demands upon regional communications infrastructure and will continue to do so into the future.

In addition, businesses in regional and rural areas (as for urban areas) have had to improve their digital connectivity and digital literacy and establish 'digital shopfront' websites and ecommerce platforms to conduct their business through, due to mandated COVID-19 shutdowns and prohibitions on in-person transactions.

Future services and networks in regional and rural areas are likely to see greatly increased demand for availability and data volumes through ongoing decentralisation of knowledge-workers over the next decade. Network operators, particularly the NBN, will need to ensure they plan early to have the increased capacity available to carry this increased traffic without congestion. It will not be sufficient to plan capacity based on what demand appears to require now – that approach will ensure nothing more than by the time it is built, it will be already inadequate. Networks and

providers servicing regional and rural areas must be prepared to forward-plan and over-provision capacity to have any chance of servicing the future growing demand.

Recommendation arising from COVID-19:

- In planning and upgrading communications technologies in rural and regional Australia, the increasing demand for highspeed, reliable connectivity for a range business and education purposes should be taken into account, recognising that an increased proportion of the population will take advantage of structural changes in flexibility of working conditions to work-from-home, and work-from-peri-urban and regional locations

3 What can Governments Do? (Questions 7, 8, 11, 12, 13)

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

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

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

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

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

We have provided several recommendations for actions Governments can take in the sections above.

We particularly wish to highlight the following topics:

3.1 Co-Planning reliability of telecommunications and electrical grid

As has been highlighted several times above, telecommunications infrastructure and electrical power infrastructure are increasingly co-dependent. Government policies and actions to improve reliability and availability of electrical power, and improve reliability of the electrical grid, would also remove a significant barrier to the construction of telecommunications infrastructure that relies on electrical power, and the reliability of the communications infrastructure. Fix the power grids to fix communications reliability.

3.2 Comprehensively monitor and evaluate outcomes of grants. Carefully examine the sub-contractor arrangements prior to the grants being given to major telecommunication groups.

Government grants are well received in rural areas but there appears to be no follow up on the outcomes provided by these grants. Evaluation of outcomes after expenditure would seem crucial,

to ensure the result has achieved the result for which the money was provided, or rectification should be ordered.

One member provided an anecdote regarding a mobile phone tower funded under the Broadband Blackspot initiative, where the siting of the tower appeared to have been done remotely by an overseas contractor, based on tools no more sophisticated than Google Maps. As a consequence, the tower was constructed in a location where the signal was significantly blocked from the perspective of a nearby town, providing little practical benefit – a useless deployment.

If the grant body had properly evaluated who is going to actually do the work on the ground (following the trail of sub-contracting relationships) and checked if they have the appropriate skills and tools, such wastage could have been prevented. Had the grant-making body properly evaluated the outcome and applied basic suitability criteria to the result, the constructors could have been ordered to remove and relocate the tower to somewhere useful before being paid the grant, ensuring the intended community achieved some benefit from the expenditure.

3.3   Review and act on recommendations and evidence from regional disaster inquiries

Telecommunications-related agencies should listen carefully during inquiries following natural disasters, and take note of evidence relating to the effects of loss of communications. Substantial relevant evidence in recent inquiries relate to rural work-place injury reports about the roles both positive and negative that telecommunications (or loss of communications) played in recovery efforts. As an example, following an incident, command post personnel who were critically reliant on communications technologies to coordinate responses and recovery should be interviewed about their experiences specifically as it relates to communications technologies and difficulties that were experienced, and remedial action planned to eliminate the difficulties in future emergencies.

3.4   Reconsider structure of regional/rural/remote subsidies and grants

We consider it is still important to provide direct support in the form of subsidies for infrastructure where such infrastructure is deemed commercially uneconomic to be deployed without assistance. However, as discussed earlier in this paper, simply repeating past programs such as the Broadband Blackspot Program should be carefully considered to evaluate whether such a program is still likely to provide significant incremental value, or whether an alternative model bolstering a different aspect of telecommunications system might achieve more significant impact.

4   Innovation and New Technologies (Questions 9 & 10)

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

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

4.1 Rapid-deployment airborne temporary cellular networks

Rapid restoration of cellular coverage **during** a disaster situation (not just several days afterwards, but while the disaster is still unfolding, and in the hours immediately afterwards), where the conventional cellular network has been rendered unusable (e.g. towers unavailable during bushfires or an extended power failure, backhaul cables severed by flood or earthquake) is a particular concern of residents in regional and rural areas.

While the mobile carriers have a small number of movable 'cells on wheels' (or COWs) trucks providing portable mobile base-stations, they typically have a reduced coverage area and limited capacity to service the needs of the increased numbers of emergency services personnel in the area as well as displaced residents.

As discussed earlier, wider range self-contained blanket coverage temporary cellular capability could be provided quickly during a disaster, through use of an innovative airborne platform such as balloons (the Google Loon project trialled in Australia being a prime case study), loitering drones, etc. Such capability requires the creation of the capability before such a disaster, suggesting that fostering and funding research and development of such a capability would play a significant role in developing a capability that may also be exported and replicated in other jurisdictions.

Recommendation
- Government should investigate whether an agency (federal or state-based) could be tasked and funded with developing such a capability, accessible by all mobile network operators, which could be deployed during a bushfire or flood event to provide continuity of cellular network coverage.

4.2 LEO Satellite

Over the next few years, several Low Earth Orbit (LEO) satellite constellation systems currently under construction (for which the 'StarLink' system is the closest to providing commercial services) will come online and have the potential to revolutionise regional and rural communications in Australia as well as across the globe.

As at the current date, the StarLink system can provide 97%+ availability, providing speeds of 100-300 Mbps and latencies in the range of 20 – 40 milliseconds, comparable or better than many urban fixed-line or cellular networks.

It is possible that access to new technologies such as fixed address LEO satellite broadband will provide a valuable alternative to – and displace - NBN Skymuster satellite, NBN fixed-wireless, and even NBN FTTN connections. In the context of FTTN as it has the potential to provide higher speeds and be more reliable than FTTN, as the householder can use a generator to power the receiver and will not need to rely on the

Figure 1 - StarLink LEO constellation as at 30/9/2021, as visualised by https://satellite.info

backbone cable infrastructure being powered. Such a solution would then not be reliant on local grid power keeping nodes or even cellular towers active.
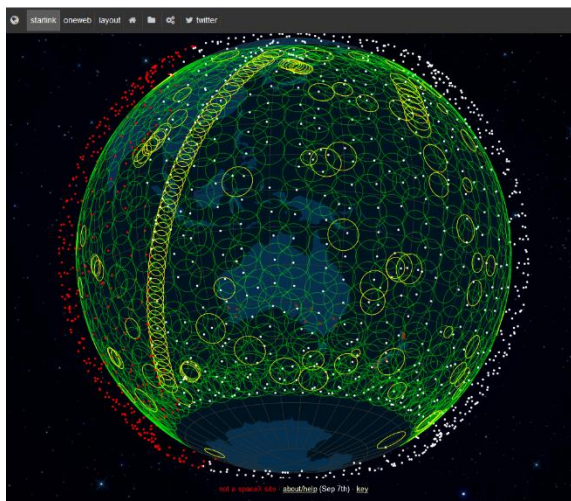
However, currently the up-front cost of Low Earth Orbit satellite services – between $600-$700 for Starlink antennas and receivers as of the current date, with a monthly recurring charge of AU$139 (relatively high compared to average NBN-based retail prices) - will be prohibitive and a significant barrier to many families. Further, it is unknown whether the equipment can handle the extreme heat conditions common in Australia, as reports indicate the equipment was designed for milder USA conditions where dealing with cold conditions is often more important than extreme heat. These two concerns may discourage uptake.

Already, technically knowledgeable businesses in regional and rural areas are considering using a LEO satellite link as a backup broadband option instead of a 4G or 5G cellular backup, and the high costs are more easily absorbed by a business enterprise.

If the price issue can be addressed, or a significant proportion of regional and rural population switch to StarLink or another LEO constellation network over the next few years away from Skymuster despite the higher pricing, then the Skymuster satellite performance may also improve through reduced congestion and reduced demand for the NBN satellite platform.

Recommendation

- We suggest to the RTIRC Review Committee that the entire set of new LEO constellations will be active at the time of the next RTIRC Review in 2024, with a significant installed base of customers with direct experience of the benefits and shortfalls of these solutions. We suggest the 2024 RTIRC Review should make evaluation of the impact of these systems a significant part of its questions and inquiries.

5   Information Provision (Questions 14,15,16)

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

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

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

We consider that these questions may best be answered by affected regional customers, and anticipate that significant material on these topics will have been gathered during the extensive community consultations conducted as part of this RTIRC Review.

An observation from our members is that independent data on relative reliability of different technology options is difficult or unable to be found, yet regional customers value reliability and dependability over simply chasing the fastest speeds – there is plenty of material comparing different technologies with respect to speeds, but little independent measurement of reliability.

Consumers don't have access to data on relative reliability or frequency of outages of different communications options and technologies, and could benefit from an independent measurement study and report into these matters

Recommendation
- Data needs to be collected and published (if not already) on outage frequency and duration - categorised and separated into metro/regional/rural – for various different communications networks or technologies. This will inform future actions to improve reliability in regional areas, and ensure remediation measures are targeted towards mitigating the most prevalent failure modes.

Thank you for your attention. We would be happy to expand on these responses more fully, as well as any other aspects of our submission, to the Inquiry members directly.

End of Submission