2021 Regional Telecommunications Review

Victorian Government Submission

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VICTORIA State Government | Jobs, Precincts and Regions

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1. EXECUTIVE SUMMARY

The Victorian Government welcomes the opportunity to make this submission to the *2021 Regional Telecommunications Review*.

The *2021 Regional Telecommunications Review* comes at an opportune time to reflect on how telecommunications markets have developed since the last review, how community and business expectations are evolving, and what the technology landscape looks like going forward.

Since the last review, there have been both expected and very significant, unexpected developments relevant to regional telecommunications. Combined, they tell a story that is familiar and persistent. That is, notwithstanding the intervening investment in infrastructure and services, many regional and rural Victorians continue to need better digital infrastructure, services, and capabilities to support the ways in which they live, work, and engage.

As expected, the trend of increasing digitalisation continues unabated, and has been dramatically propelled forward since the last review. It is driven by the ingrained, universal and growing acceptance of the value of digital technologies and services across all aspects of daily life, experienced through and underscored by:

- continual technology evolution and migration of goods and services to digital platforms, meaning that the range of affordable and usable digital services is expanding to become basic necessities for citizens and businesses to function
- increased business, personal and professional reliance on connectivity, with consumers, families and households, as well as for small, medium and scaled businesses in all sectors
- the impacts of natural disasters including fires, floods and COVID-19, sharpening the need for resilient and instantly reliable connectivity during such times
- pressure on telecommunications network providers as they transition to more sustainable industry structure which generates acceptable rates of return on network investment.

Victoria's regional stakeholders continue to advocate strongly on their digital needs, the persistent disparities between well-served, digitally inclusive areas and the lagging, difficult to reach places that are being left behind even while the next phase of the national broadband network upgrades take place. Such "difficult to reach" places are not necessarily rural or remote areas but happen to include many peri-urban localities around the state which continue to have patchy connectivity when it comes to fibre-to-the-premise or reliable 4G/5G network coverage.

Ultimately, the regional telecommunications picture is a dynamic one, in terms of technology development and uses, but which reflects consistent challenges in terms of delivering the standard of services regional users need. Based on our most recent lived experience and geographic analysis in Victoria, we can confirm that the regional picture does not always neatly fit the pattern of "the further out and more remote, the less well connected".

Technology will continue to advance, society will increasingly rely on it, and the reasons that underpinned service disparities decades ago persist and are likely to continue driving a wedge between regional and metropolitan markets.

The Victorian Government has identified three key themes which it encourages the Committee to consider. These themes relate to the effectiveness of existing government policy and programs at both the Commonwealth and state government levels, the impact of recent natural disasters and the importance of regional digital inclusion.

Sustain and increase investment

Regional telecommunications markets require sustained investment and support by the Commonwealth Government in response to persistent challenges, continued technology development and growing stakeholder expectations. This is particularly the case given the continued expansion of the digital economy and the significant shifts in supply conditions for regional digital connectivity in recent years.

Key messages:

- The Commonwealth Government should commit to a significant increase in its direct subsidy programs to address connectivity gaps such as through its Regional Connectivity Program (RCP) or similar flexible, place-based program. Indicatively, up to $2 billion over five years would be proportionate to the scale of commitments made by jurisdictions like Victoria and reflect a substantial increase to what the Commonwealth Government has invested through direct subsidy programs over the last five years.
- The Commonwealth Government should establish a regional telecommunications policy and investment framework which takes into account the completion of the NBN, the need to address connectivity gaps to drive regional growth and inclusion and which recognises the importance of resilient critical communications.

- Recognising the Commonwealth Government's primary responsibility for telecommunications, the Victorian Government urges the Commonwealth to move quickly to partner with state programs and maximise benefits to regional users.
- The Commonwealth Government should invest over longer time frames, such as a five year forward-investment program, to provide more clarity and certainty to states, territories and regional stakeholders including the telecommunications industry to assist their planning and ability to organise co-investment.
- The Commonwealth Government should continue and expand programs such as its RCP that can encourage flexible place-based responses and innovation, including in relation to new technologies (such as low earth orbit satellite services), attracting new partners and exploring new delivery models (for example carrier-neutral infrastructure providers).

Emergency communications

The last 18 months in Victoria have emphasised the significant increase in community expectations and reliance on telecommunications services as well as the extent of network vulnerabilities which pose public safety concerns for future emergencies.

Key messages:

- The Commonwealth Government needs to develop a solution for emergency mobile roaming to improve access to communications services during emergencies like natural disasters and better support community safety.
- The Commonwealth Government needs to develop a national policy and program funding approach focussed on addressing the vulnerabilities of telecommunications to natural disasters, most significantly regarding the impact of power outages.
- The Commonwealth Government should commit to a major increase in direct subsidy funding available to improve emergency communications resilience through a program similar to its Strengthening Telecommunications Against Natural Disasters Program.

Focus on the digital divide

Regional telecommunications issues often focus on infrastructure gaps; however, the related digital inclusion considerations of affordability and ability are also important to support regional economic and social development and traditionally have not received adequate attention.

Key messages:

- With the completion of the National Broadband Network (NBN), the Commonwealth Government should turn its attention to other barriers to participation in the digital economy (noting 2.5 million Australians are not on the NBN).
- The Commonwealth Government should develop more targeted affordability measures that reflect how people use digital technologies, for example recognising the preference of low-income households for mobile over fixed-line internet services and device affordability.
- The Commonwealth Government should lead efforts to improve the quality of information and data available from telecommunications providers as well as support the technical capacity of local communities and local governments to enable on-going place-based analysis of coverage issues, along with a coordinated framework for considering affordability and ability gaps.

2. DIGITAL CONTEXT

Relevant to Issues Paper questions: 1, 2, 6, 8

Since the last review, whilst the basic context regarding regional telecommunications remains the same, most factors have experienced shifts in the level of importance of communications to living, working and remaining connected in times of emergency. Telecommunications:

- remain of critical importance to economic and social development in regional and rural communities and their participation in the digital economy
- are vital to public safety, needing failsafe connectivity in times of need
- lag more densely populated metropolitan areas, in terms of new infrastructure deployment and the quality and reliability of services
- require public and private sector investment to address the persistent gaps in many regional areas, especially with private operators focusing more on capital-heavy commitments to deploy networks (including 5G) in built-up and metropolitan areas
- gaps continue to be targeted by programs by both the Commonwealth and state governments.

What has changed since the last review however is the drastic consequences for businesses and communities of persistent gaps has been revealed by significant events including bushfires, floods and a pandemic.

These events have highlighted the critical reliance communities now place on digital connectivity, and how much more consequential gaps are for those who are digitally excluded. Future telecommunications policy and programs need to understand and respond to this shift in expectations and needs.

Importance of digital

Digital technologies are central to the way in which modern economies function. Being able to access and use affordable internet and digital technologies is now how we connect with others, how we work and learn, how businesses innovate, access customers and grow, and how we access and use services.

Given the increasingly ubiquitous nature of 'digital' in everyday life, there is little to differentiate the digital economy from the broader economy; in other words, the digital economy is the economy and will continue to play an important role in transforming society as we know it.

While important to all geographies and user groups, digital connectivity plays a particularly significant role in regional areas by breaking down barriers of cost and distance and enabling more equitable access to services and economic opportunities.

In Australia's present-day digital economy, technologies, data and digitalisation have transformed interactions between consumers, businesses and governments alike. Examples include:

- **Consumers**: Digital technologies have lowered prices of goods and services, increased choice and provided better data and information to inform decision-making. However, there is a risk that such benefits are felt more in CBDs and metropolitan areas than in Australia's regions
- **Businesses**: Organisations both in Australia and globally have faced disruptive change from digitalisation, and this has enabled them to expand into new products and markets. While innovators and fast adopters of new technologies may thrive, other businesses may struggle to adapt to the digital economy. Regional businesses that are less digitised than those in metropolitan areas are more exposed to the risk of such disruption.
- **Governments**: Digital technologies are prompting large-scale changes for local, state and federal governments alike in Australia, from the design of regulation to the delivery of infrastructure and services within the bounds of the digital economy. This is also seeing a trend towards the democratisation of services with increased levels of accountability, transparency etc. Without adequate digital adoption in regions, such democratisation of government services in regional areas runs the risk of lagging that in urban areas.

The importance of digital technologies to future economic prosperity in regional areas has been highlighted by the recent report by the Commonwealth Government's Australian Broadband Advisory Council into Australia's agtech

digital opportunity.[1] The report indicated that "widespread adoption of digital agriculture is critical to lifting the value of Australian agriculture from $60 billion to $100 billion by 2030, an objective set by the Australian Government." The path to achieving this outcome is outlined by the report and discussed on page 25 of this submission.

In addition to economic contribution, digital opportunities present a myriad of other benefits important to regional communities and Victoria overall including:

- Improved social inclusion broadly across Victoria, including improved access to digital services and connectivity for individuals in low socioeconomic communities
- Reducing the regional digital divide and increasing opportunities for regional businesses and communities to benefit from the economic and social opportunities of the digital economy
- Community resilience as when leveraged for public safety and emergency response, technology can save lives during events like natural disasters
- Population retention and attraction for Victoria with employees able to more flexibly choose their living location and work remotely using technology
- Greater social and economic adaptability, with a more mobile workforce not as reliant on large local 'anchor' employers
- More vibrant and sustainable outer-suburban, interface and regional communities and economies due to improved connectivity
- Improved mental and physical health through work life balance, including greater flexibility for primary carers balancing employment opportunities with family and other caring obligations.
- More sustainable city growth and infrastructure cost savings.

COVID-19 has highlighted the importance of the digital economy including in regions

The Committee's issues paper asked *how the use of digital services changed for regional consumers and businesses during the response to the COVID-19 pandemic and what insights for future service delivery this experience provides*.

Although Australia's digital economy is generally advancing, there remain significant and far-reaching opportunities for further development. This has been exacerbated by the recent COVID-19 global pandemic, which has advanced connected technologies as an absolute necessity, including for remote working, telehealth, e-commerce and the digitalisation of education and training.

COVID-19 has dramatically altered work and home life and accelerated reliance on digital connectivity and technologies, which forms important context to this submission. Examples of the impacts of COVID-19 in Australia include:

- Fixed upload demand has risen 42% since the COVID-19 pandemic crisis began as more people rely on high-quality digital connectivity to work remotely, and reflects businesses decentralising their workforces which is expected to continue longer-term
- Businesses are accelerating their adoption of digital tools and business models to survive, as well as to stay in touch with partners, suppliers and customers
- Telehealth and online education are becoming more mainstream as more users were forced to consume services online - more than 4.3 million health and medical services have now been delivered to a total of more than three million patients through telehealth
- There is greater understanding among business on the value of investment in digital infrastructure, tools and capabilities, especially the skills of their employees
- Businesses that had previously adopted technology, were already digitising key functions and had invested in effective systems and software have fared better than others
- There is also heightened understanding of the essential role that digitalisation plays in improving regional inclusion, thereby reducing what is commonly referred to as the "digital divide" between metropolitan and regional areas.

[1] Report prepared on behalf of the Australian Broadband Advisory Council (ABAC) by the Agri-tech Expert Working Group (AEWG). https://www.communications.gov.au/documents/agri-tech-expert-working-group-june-2021

The implications of these impacts longer-term are that people and places with low levels of digital inclusion and low-quality connectivity already and will continue to find themselves at an even greater disadvantage as more services and opportunities become accessible only to those meaningfully engaged online.

Natural disasters highlighting coverage and reliability issues

The 2019-20 fire season and recent severe storm and flooding events have demonstrated inherent vulnerabilities within telecommunications networks, mainly relating to power outages and some damage to facilities.

These failures have impacted the ability of communities to access emergency communications and information services such as:

- triple zero emergency communications
- personal critical communications to contact family and friends
- VicEmergency app to keep up to date with real time emergency event developments
- text-based emergency alerts to receive critical information as it developed.

The 2019-20 Victorian bushfires impacted 324 telecommunications facilities with 38 Victorian communities experiencing a full or partial loss of communications with 17 of these communities being further isolated from road access and triple zero.[2]

Meanwhile, the 2021 severe storms and flooding impacted 500 NBN exchanges/nodes affecting around 175,000 NBN services and around 230 Telstra, Optus and TPG Telecom mobile towers. 49 communities were assessed as being isolated from triple zero during these outages.

With severe weather events expected to continue and become more frequent, these vulnerabilities and their implications for public safety are of critical importance and an area of significant interest to Victoria. These emergency communications issues and their implications are discussed further in **Section 7**.

Changing expectations

The Committee's issues paper asked *what changes in demand need to be addressed when it comes to telecommunications services in regional, rural and remote Australia*.

The standard of service needed and expected outside the state's metropolitan areas has increased significantly, particularly in light of the COVID-19 pandemic. Today's regional users require high-quality, reliable, affordable and high-capacity services to support their increased reliance on digital connectivity.

The Victorian Government is currently undertaking extensive community engagement to help inform implementation of its Connecting Victoria program. Already this engagement has identified over 5,600 locations where local community members have indicated an issue with services not meeting their needs.[3]

Merely having a connection is no longer enough, with stakeholders across regional, rural and remote areas, as well as outer suburban interface councils, raising issues with quality and reliability of coverage particularly in relation to lower quality NBN services like fixed wireless and satellite and patchy, unreliable and/or weak access to 4G mobile networks.

Modern requirements for data access make it clear that 3G mobile networks are no longer adequate to meet community and business needs. This reality has important implications for government efforts to expand regional mobile coverage, which must shift from placing value on 3G coverage towards 4G and better.

Future mobile black spot funding programs and other investment into regional telecommunications markets must recognise these changing expectations and their implications for program design, gaps analysis and priority investments.

Regional opportunity

While the challenges of the pandemic have been obvious, it has also presented a significant economic development opportunity for regions. This opportunity centres around the increased appeal of regional lifestyles and the ability of digital technologies to enable 'work from anywhere'.

Significant internal migration has been widely reported across Australia and is most clearly reflected in increasing regional house prices. The long-term sustainable economic development opportunity offered by this trend is

[2] Based on reporting provided by carriers to the State Control Centre during the fire season and recent storms and flooding
[3] https://engage.vic.gov.au/connecting-victoria

potentially significant if this growth can be adequately planned for and accommodated. While it has been prompted by a global pandemic, digital connectivity (among other policy areas) has the potential to sustain it.

A shift of businesses and workers into regional areas, bringing higher regional income and greater industry diversification can underpin more resilient, sustainable and growing regions. Digital technologies can support more people to work, live and study locally in regional and rural areas, enhancing the appeal of these areas and contributing to more economically vibrant regions. This opportunity is another lens through which regional digital connectivity needs should be considered, recognising the broader government policy objectives such as regional development, resilient regions and easing CBD infrastructure pressure which better regional digital connectivity can enable.

Digital technologies also offer significant industry development opportunities across the regions, for example through emerging internet of things applications across sectors like agriculture and manufacturing.

Digitalisation is about more than just infrastructure

The *Australian Digital Inclusion Index* reports sets out a digital inclusion framework based on three core pillars of access, affordability and ability.

This is a useful framework, and the Victorian Government recommends this concept of digital inclusion as an important one for consideration by the Committee when framing its recommendations. While access, in the sense of telecommunications infrastructure, is readily understood and commonly identified in regional digital priorities, the other components of affordability and capability are also vital, but their gaps and issues are less well understood.

Being mindful of all components of digital inclusion is critical to support regional and rural outcomes of interest to ensure that not only are digital services available, but they can be readily adopted and effectively used to realise the benefits of the digital economy. This issue is discussed further in **Section 6**.

Changing telecommunications market structure

Recent and emerging telecommunications market developments present potentially new market dynamics with implications for regional consumers and businesses. These developments include:

- the separation and sale of telecommunications infrastructure network assets
- the emergence of carrier-neutral infrastructure providers
- an array of smaller telecommunications infrastructure providers, often with strong community engagement with bespoke, place-based offerings
- NBN Co's movement away from fixed wireless network configurations
- new commercial low-earth orbit satellite service providers
- future privatisation of NBN Co
- expected 3G switch off in coming years and deployment of 5G networks.

These are significant telecommunications market developments both currently emerging and on the horizon; each of which is likely to affect regional telecommunications services and users to some degree. Some of these developments will be opportunities for governments, industry and users to leverage to improve regional connectivity and digital inclusion. While others are less clear or more likely to present risks to be managed by regulators and the Commonwealth. In particular, opportunities presented by new technologies will often require government support to share risks to test their validity.

The Victorian Government encourages the Commonwealth to be clear about how it is engaging with and monitoring these issues and look to support innovations and technology developments to support more fit-for-purpose telecommunications across regional and rural areas that compliment national infrastructures and policies. Further discussion of these developments is provided at **Appendix B**.

Role of Government

The Commonwealth Government has primary responsibility for the telecommunications sector and the adequacy of services across Australia.

States and territories play complementary roles as users, advocates, and funding contributors of telecommunications infrastructure based on their responsibility for key service delivery areas, in particular education and health which are increasingly dependent on digital infrastructure, as well as broader policy objectives aimed at driving economic and social development.

The Commonwealth's role has been reflected in a range of activities including telecommunications sector legislation (that includes broadcasting), regulation and direct investment (through ownership of NBN and through competitive grant funding available to carriers) aimed at fostering competitive market outcomes, innovation and delivering a minimum standard of telephone and internet services.

Technology developments and the reality that businesses and households face varying digital infrastructure needs and priorities from location to location mean that broad, one size fits all approaches to digital infrastructure are becoming less effective at ensuring the appropriate availability of digital services from place to place. It is imperative that there is good quality information and data to identify persistent gaps and understand where services do not meet the needs of users.

The Victorian Government supports telecommunications infrastructure projects for various economic and social development objectives in a targeted, place-based approach to take advantage of new technology opportunities, partner with/supplement Commonwealth Government funding and/or address infrastructure gaps not solved by Commonwealth Government policy settings and investment. These initiatives have taken the form of mobile black spot programs, public WiFi networks, enhanced broadband networks, Internet of Things projects, skills development, digital hubs, and early-stage adoption programs (further information in **Appendix C**).

In recent years, some state governments, most notably Victoria and NSW, have committed unprecedented funding towards digital connectivity gaps. These commitments have recognised the need for continued and substantial investment in digital connectivity to support economic recovery, address the digital divide and to build resilience in telecommunications infrastructure during natural disasters.

The Victorian Government considers it critical that the primacy of Commonwealth Government telecommunications policy and program responsibility is maintained and funding support is expanded in the coming years. In particular, the time for the Commonwealth to partner with states and territories to invest alongside them and enable a transformational shift in the digital connectivity landscape is now.

3. THE PROBLEM

Relevant to Issues Paper questions: 1, 2

Digital Plans and stakeholder engagement

The Victorian Government supported the development of nine Regional Digital Plans; one for each Regional Partnership area of the state. These plans highlighted the digital infrastructure variability across the state and the shortfalls in where services are unlikely to meet all user needs. They provide a valuable basis for further consideration and prioritisation of regional digital infrastructure funding, however, also face limitations in the quality and currency of available data which can accurately show the real world quality and reliability of services that regional users face. Digital plans are discussed further in **Appendix E**.

In order to support the Victorian Government's implementation of the Connecting Victoria program (discussed further in **Section 4**), the state is undertaking an extensive community engagement process to better understand the lived experience challenges. This engagement is important to support a place-based prioritisation and delivery approach, but also necessary given the difficulty of identifying areas across the state with coverage issues given the limitations of available data. Already this engagement has received 5,600 contributions from community stakeholders regarding service issues in their locations.

A series of regional stakeholder roundtables have also been undertaken to support implementation of the Connecting Victoria program. Key themes emerging from these contributions include:

- Lack of connectivity in regions as a major factor inhibiting digital advancement in agriculture including IoT and other technologies.
- Poor broadband connectivity impacting students' ability to participate in remote learning. COVID based home schooling has further intensified this challenge.
- The need for connectivity during natural disasters and emergencies, especially bushfire is a significant concern. Difficult terrain in regions further intensifies the connectivity challenge, making it difficult to reach out to the local population and visitors only increases safety concerns.
- Unavailability of high-speed internet is impacting remote working, hindering regional business expansion and creation of jobs, and skill enhancement. Competitive internet connectivity is necessary to attract businesses to invest in regions, support growing tourism, and migration trend to regional areas
- Digital literacy is a challenge in low socio-economic and elderly demographics
- Increased need for better internet connectivity to support telemedicine
- Lack of mobile coverage and connectivity for tourists in regions as a key reason for poor visitation experience and, in some cases, even reduced yield and length of stay.

Some regional stakeholders have built off their Digital Plans and further investigated their connectivity needs. One local government area in particular found they were provisioned with a much higher proportion of lower quality satellite and fixed wireless NBN services. Their analysis found that more than 66 per cent of their NBN connections are fixed wireless and satellite. A survey of businesses in their area found that 90 per cent reported slow speeds and 61 per cent experienced dropouts of service.

The Agri-tech report of the Australian Broadband Advisory Council highlights this issue with the concept of "salt and pepper" connectivity:

> *The term 'salt (good connectivity) and pepper (poor connectivity)' … describes how one farm or section of a farm has good connectivity, but the neighbouring farm or another section of the farm does not. Both are within the same local area and most likely notionally served by the same NBN wireless tower or mobile tower.*[4]

Digital Inclusion Index

Digital access at a macro level is well described in the ADII. The most recent ADII shows a clear disparity of access between urban and regional communities, and other characteristics that impact the availability and uptake of telecommunications. The ADII shows that digital access is worsened by factors that negatively impact the

[4] Report prepared on behalf of the Australian Broadband Advisory Council (ABAC) by the Agri-tech Expert Working Group (AEWG). https://www.communications.gov.au/documents/agri-tech-expert-working-group-june-2021

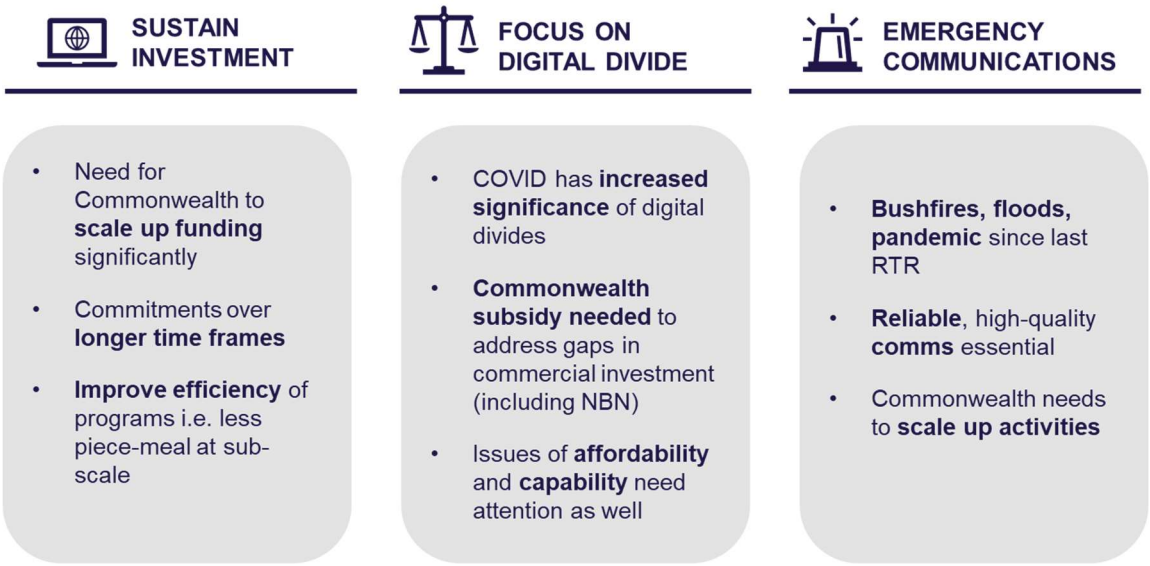
ability to afford and then effectively use digital services and applications – strongest amongst these low income, employment and education status that are generally worse in the regions.

Key take outs of 2020 ADII.

1. Digital inclusion is increasing in Australia, but the rate of increase is slowing. In Victoria it has been static over the past two years.
2. The gaps between digitally included and excluded Australians are substantial and widening for some groups.
3. Although internet infrastructure is available to almost all Australians, more than 2.5 million remain offline, reflecting the difficulty in reducing the number of Australians who are not connected.
4. NBN take-up continues to close the gap in Access for rural Australia, noting the NBN is now complete.
5. Geography plays a critical role. In 2020, digital inclusion is 7.6 points higher in capital cities (65.0) than in rural areas (57.4). In Victoria this gap has narrowed, but has stalled with the completion of the NBN
6. Affordability remains a key challenge and is likely to be exacerbated by the COVID-19 economic slowdown.

Key issues

The Victorian Government has identified three key issues regarding regional telecommunications for the Committee's consideration. They are summarised below and expanded on in the following sections.



The need for a strong collective focus on these issues by governments is premised on the digital context (outlined in chapter 2) that sees the growing importance of digital communications, combined with the following observations on constraints to infrastructure development apparent in regional markets.

<u>NBN rollout complete</u>

With the completion of the NBN there remain significant entrenched disparities between urban and regional communities' digital experiences. Further inroads into digital disadvantage are therefore likely to be more difficult and require more targeted efforts.

The most obvious of the remaining disparities is the vast difference in capabilities between NBN wireless and fixed line infrastructures, and other emerging technologies. This raises questions about how adequate NBN technologies and service bundles are for specific place-based needs, and how easy it is for businesses and households to upgrade and or fill remaining gaps.

Secondly, even with the availability of NBN infrastructure, as noted previously uptake is dependent on capabilities to use and ability to afford telecommunications services.

While there are alternative fit for purpose technology solutions to regional telecommunications gaps there are also risks to investing in innovation, given uncertainties how NBN infrastructures and services can be leveraged and how NBN wireless may be upgraded overtime.

Market responses are limited and constrained in regional markets

Where alternatives to NBN exist and provide fit for purpose solutions to regional telecommunications needs, government interventions to deal with these disparities need to take into account both the market dynamics of less populated markets as well as the unique place-based demand drivers and supply constraints for alternative infrastructures.

Governments therefore have a crucial market organising role in underserved markets. As for all network infrastructures, there are insurmountable barriers to telecommunications upgrades for the individual actor. For example, businesses within some communities with poor fixed and mobile services are unable to upgrade their services because of their distance from adequate backhaul capacity, and where the costs of upgrade fall outside the parameters for NBN remediation (see Alpine regions case study below).

In the Alpine regions case study, it is clear that infrastructure upgrades could deliver benefits to a number of user groups and could therefore be achieved through multi-stakeholder partnerships coordinated by, and where needed subsidised by government (see also Leveraging Infrastructure Builds in **Section 7**).

Access issues need to be considered with a focus on digital inclusion

With respect to access issues (acknowledging these are not the only barriers to digital inclusion, with **Section 6** discussing the other barriers of affordability and ability), the current approach on addressing infrastructure gaps in more densely populated areas is justifiable, given the larger number of households and businesses that benefit from these investments and the larger expected economic and social impact. However, the Commonwealth Government must also focus on places that lag on adequate connectivity to be able to participate in the digital economy.

NBN Co's investment program is targeting upgrades in areas that deliver a minimum commercial rate of return to the NBN. This is understandable given the operational parameters of NBN Co, however it demonstrates a significant limitation of relying on the NBN to address infrastructure access gaps. Investment under this framework will prioritise investment for commercial benefits but will fail to prioritise locations based on their digital inclusion needs.

In the absence of government subsidy, there will continue to be underserved areas in sparsely populated areas that lack clarity on when or how they will be able to access service improvements over time. These can be expensive to reach places with limited opportunities under current programs to receive upgrades in the coming years, notwithstanding the Commonwealth Government's Regional Connectivity Program (RCP) which targets satellite and fixed wireless areas for upgrades but is still limited in scope and scale.

Connectivity needs of Alpine areas – case study

Victoria has received advocacy across multiple Alpine areas regarding the connectivity challenges they face.

These challenges impact a number of significant local businesses, as well as community members and visitors. These areas report lower quality NBN services available like satellite, which faces capacity constraints and does not meet many user needs. Some areas are connected to legacy ADSL services which for some users offers better quality services able to meet the needs of users. Yet these services are required to be discontinued in future[5], leading to an infrastructure environment where newer infrastructure (NBN Satellite) is less desirable than legacy services.

The cost of improving infrastructure in these areas is high, and insurmountable for any one investor on standard investment parameters. However, these complex cases may be viable when multiple stakeholders (including fixed and mobile service providers), all of which would benefit from improved infrastructure, are able to coordinate their investment and spending.

Challenging places like those described above indicate the need for a concerted effort to identify and address these lagging locations where community and business needs are not being met now that the NBN rollout is complete. It is likely the case that some of these places, while cost prohibitive to upgrade for one investor alone, could be feasible when state, Commonwealth and local governments can work together in partnership with industry and local businesses. For example, coordinated investment across multiple parties in backhaul

[5] Telstra is obliged to discontinue these services consistent with its Structural Separation Undertaking given to the ACCC under the Telecommunications Act - https://www.accc.gov.au/regulated-infrastructure/communications/industry-reform/telstras-structural-separation-undertaking

infrastructure into these hard to reach places could then make subsequent investments in fixed-line and mobile networks upgrades more viable.

Assessing and prioritising these areas through the lens of digital inclusion outcomes will help ensure lagging locations are given fair consideration. Limited investment parameters focussing on economic/commercial drivers alone, or focussing on the cost of upgrades, will fail to address such places leaving local communities and businesses lagging with limited opportunities for service improvements over time.

4. KEY THEME 1 - SUSTAIN AND INCREASE INVESTMENT

Relevant to Issues Paper questions: 3, 9, 11, 12, 13

Key Points

- The Commonwealth Government should commit to a significant increase in its direct subsidy programs to address connectivity gaps such as through its Regional Connectivity Program (RCP) or similar flexible, place-based program. Indicatively, up to $2 billion over five years would be proportionate to the scale of commitments made by jurisdictions like Victoria and reflect a substantial increase on what the Commonwealth Government has invested through direct subsidy programs over the last five years.
- The Commonwealth Government should establish a regional telecommunications policy and investment framework which takes into account the completion of the NBN, the need to address connectivity gaps to drive regional growth and inclusion and which recognises the importance of resilient critical communications.
- Recognising the Commonwealth Government's primary responsibility for telecommunications, the Victorian Government urges the Commonwealth to move quickly to partner with state programs and maximise benefits to regional users.
- The Commonwealth Government should invest over longer time frames, such as a five year forward-investment program, to provide more clarity and certainty to states, territories and regional stakeholders including the telecommunications industry to assist their planning and ability to organise co-investment.
- The Commonwealth Government should continue and expand programs such as its RCP that can encourage flexible place-based responses and innovation, including in relation to new technologies (such as low earth orbit satellite services), attracting new partners and exploring new delivery models (for example carrier-neutral infrastructure providers).

Based on the scale, persistence and complexity of regional digital access issues there is a need for a more sustained and coordinated Commonwealth effort.

Telecommunications markets and technologies are rapidly evolving - certainty and consistency of funding support is required for states and communities to sustain the effort and build the capabilities required to develop place-based solutions that can sustain regional service improvements.

First and foremost, it is critical for the Commonwealth to provide leadership given its fiscal capacity and ownership of the regulatory controls. Exercising its leadership will ensure the coordination of policy and funding opportunities across jurisdictions. With the recent completion of the NBN, yet the persistence of connectivity gaps, there is a need for the Commonwealth Government to reframe its longer-term regional telecommunications policy and investment objectives including in relation to:

- funding commitments and certainty
- approach to partnering with state programs
- supporting innovation and new market developments
- addressing telecommunications network vulnerabilities during emergencies (refer **Section 5**).

Commonwealth funding programs

While the Commonwealth has made substantial and valuable commitments in the past decade across a broad range of program areas there is an urgent need for the Commonwealth to increase the scale of these programs and improve how they are implemented.

The practical impact of emerging deficiencies in some programs, such as the MBSP has been that potential co-investors have been less able to participate and there have been limited opportunities for communities and industry to partner to develop sustainable place-based solutions.

The Victorian Government recognises that the Commonwealth Government's investment in the NBN has significantly lifted the standard of broadband services available to many regional users and has established a fixed-line wholesale network infrastructure that is suited to gradual improvement over time. However, there are also limitations to the NBN network as noted in the previous section, largely relating to fixed wireless and satellite areas which need redress.

The Regional Connectivity Program was well supported in Victoria (notwithstanding issues outlined in the next section), demonstrating the benefits of a flexible, place-based approach. The Victorian Government utilised the Regional Partnership Digital Plans to identify target areas for state funding support that aligned with community and carrier strategies.

The first round of the RCP supported a diverse range of solutions including with a range or carriers and regional stakeholders, and a range of place-based solutions including:

- fibre to the premises in important regional service centres in rural areas (wireless upgrades),
- backhaul projects to improve extensive regional fixed network resiliency and to support new mobile coverage, and
- mobile upgrades where capacity and needs are challenged in locations with high seasonal populations.

Table 1 - Overview of current Commonwealth Government digital infrastructure programs

PROGRAM	COMMENT
Mobile Black Spot Program	➢ Six rounds funded to date ➢ One round left of funding ➢ Major impacts in early rounds but Recent guidelines have struggled to attract strong industry interest given the over-emphasis on new coverage rather than improved coverage ➢ Carrier coverage information not public and carrier coverage maps inconsistent with regional feedback of the lived experience ➢ Unclear funding future
Regional Connectivity Program	➢ Result of the last RTIRC report advocating for more flexible, place-based programs from the Commonwealth ➢ Excellent program, strongly oversubscribed with high quality applications ➢ Uncertainty about Round 1 project decision making and feedback to guide preparation for Round 2 ➢ Commonwealth allocated extra funding to Round 1 and new funding to Round 2 recognising this ➢ Round 2 funding limited for Victoria with funds earmarked for northern Australia ➢ More transparent time frames would support better forward planning by states and regional stakeholders
Peri Urban Mobile Program (PUMP)	➢ New program ➢ Welcome initiative that recognises peri-urban areas can share similar challenges to regional areas for adequate connectivity ➢ Peri-urban previously excluded from MBSP funding and Commonwealth programs ➢ $16m funding envelope inadequate to address the scale of the problem
Strengthening Telecomms Against Natural Disasters (STAND) program	➢ Response to 2019-20 bushfires and impact on telecommunications networks ➢ Demonstrating good outcomes – satellite backup emergency communications and increased battery backup ➢ $37.1m funding level inadequate to address scale of national vulnerabilities

NBN Capital Upgrade program	➢ Constrained by NBN requiring a commercial return, including fo funding allocated for state, territory and local government co-investment ➢ We consider it business as usual industry activity, just like Telstra/Optus expanding their networks ➢ Inadequate to address the digital divide in places that results from a lack of commercial incentives ➢ States have to do the heavy lifting to target places of persistent disadvantage.

The Victorian Government has a number of suggestions on how Commonwealth Government programs can be improved to better meet the needs of regional stakeholders.

Scale up funding and partner with states

The Commonwealth Government's obligation to ensure the adequacy of telecommunications services demands more funding.

Some states, most notably Victoria and NSW, have committed $550 million and $400 million respectively towards their own regional digital infrastructure improvements (referring to Connecting Victoria and NSW's Regional Digital Connectivity programs, respectively). These commitments recognise the much greater reliance people and businesses have on adequate services, as well as the persistent place-based gaps and limitations that still impact regional digital inclusion.

These state commitments are substantially larger than the Commonwealth Government's current funding commitment. While the NBN has announced a large-scale capital investment program, these programs may not be meeting the needs of the most disadvantaged regional areas given NBN requirements to deliver stipulated Return on Investment (and within its existing cost constraints) that mean it is unable to remediate the most difficult connectivity challenges without additional government subsidy.

Areas of greatest needs are in the NBN wireless and satellite footprints, including on-farm connectivity that can unlock productivity enhancing agtech applications. The Commonwealth Government should continue and expand its Regional Connectivity Program which partly targets these issues, noting how the efficiency and effectiveness of this program can be enhanced.

Indicatively, the Commonwealth Government could commit to a major (up to $2 billion) increase in its direct subsidy programs to address connectivity gaps through its Regional Connectivity Program (RCP) or similar flexible, place-based programs. This scale of funding would align proportionately with the Victorian Government's $550 million Connecting Victoria funding commitment and offer the potential for other states and territories to partner with the Commonwealth at a similar level. This level of commitment would also reflect a substantial increase over longer-time frames to the Commonwealth Government's direct subsidy commitments in recent years which have largely been through its Mobile Black Spot Program (MBSP - $380 million committed since 2015), RCP (around $270 million committed since 2020) and STAND program ($37.1 million).

In relation to emergency telecommunications issues, the STAND round 1 and 2 initiatives are welcomed but demonstrably inadequate to address the scale of the problem (discussed further in **Section 5**).

Improve consistency and certainty of funding and ensure adequate timeframes

To enable better planning, coordination and partnering, Commonwealth Government digital programs need to be delivered with greater certainty, coverage information and transparency in decision-making over longer time-frames.

Doing so would better support states and territories to align their own budget processes to available Commonwealth funding as well as allowing sufficient timing for states to plan and undertake stakeholder engagement to coordinate priorities and potential funding contributors across industry.

For example, round one of the Regional Connectivity Program was too short to allow adequate community engagement with solution providers (which was compounded in Victoria by COVID 19). This impacted both the state and communities' ability to consider a broad range of potential project options and ways to leverage investments to deliver benefits across multiple communities. Despite this, the quality of projects identified in the RCP were excellent, highlighting the value of this more flexible funding approach which can be better supported in future by longer time frames to plan and engage, noting that Victorian proposals benefited from recently completed Digital Plans.

The Victorian Government considers that a five-year funding horizon from the Commonwealth Government with longer round open timeframes of 6-12 months would enable better forward planning by states and better quality projects to be developed between states, industry and local stakeholders.

Flexibility

Place-based solutions - that respond to varying geographies, population densities, and community and business needs - require a flexible approach to funding solutions. On this basis, The Victorian Government would prefer to see a continuation and scaling up of the Commonwealth's RCP rather than its Mobile Black Spot Program (based on recent program guidelines). This preference and relative effectiveness of RCP over MBSP has also been demonstrated by the greater willingness of industry to partner on projects through the RCP.

The key benefit of the RCP is its ability to enable a mix of problems to be dealt with (e.g. fixed-line broadband improvements as well as mobile network upgrades) which also makes it more flexible in being able to attract a mix of funding sources. In Victoria, some round 1 RCP projects that were successful included a new fibre link in north-east Victoria that can improve service redundancy during outages, as well as enabling new and improved coverage at multiple locations across the transmission route.

Such multi-benefit projects may require more planning and coordination across stakeholders but can deliver significant benefits to multiple communities when done well. Programs that are flexible enough to support such outcomes will be extremely valuable particularly for places that are seen as cost-prohibitive for upgrades when viewed through only a single investor / infrastructure lens but become feasible when coordinated across a range of investors and infrastructure needs.

The RCP program was also valuable in its flexibility to support projects that improve mobile coverage, rather than an overemphasis on delivering new coverage alone. The frustration of many regional stakeholders is not just that they may lack coverage, but that what coverage they do have is weak and/or unreliable and can become compromised when there are increased demands placed on the network.

Clarity and consistency of objectives

Greater clarity and consistency of the Commonwealth Government program objectives would assist state and other stakeholder activities to better align their efforts, in particular by guiding industry investors where to best focus their attention. Some of the key areas where greater clarity would be beneficial include:

- Infrastructure competition objective – thin regional markets tend to be monopoly markets with a single infrastructure provider. These markets reflect a limitation of the broader regulatory objective of driving infrastructure competition and may therefore require alternative approaches to support coverage, investment and citizen choice outcomes. A greater degree of customer choice in regions is likely to result in a better provision of appropriate and targeted services to respond to a growing variety of needs in regional areas (e.g. agricultural customers have very specific communications needs and these are different to the needs of households or SMBs in small towns).
- Innovation – it is unclear to what degree the Commonwealth Government seeks to support and encourage new regional telecommunications infrastructure models and providers, particularly smaller, bespoke providers and solutions that can address particular areas of inadequate connectivity, such as NBN satellite and fixed wireless areas and on-farm connectivity.
- Investment risks – with a limited understanding of Commonwealth Government regional telecommunications investment priorities and market expectations, industry investors may be wary to invest and compete, such as against the NBN, if the risk of doing so and the Commonwealth Government's potential response is unclear.

Victorian Government policy and programs

The Victorian Government's approach to dealing with regional telecommunications issues is guided by a number of principles including:

- Not assuming Commonwealth Government responsibilities but work in partnership to leverage investments and maximise benefits to Victoria
- Focussing on place-based solutions – supporting regional communities to develop plans, strategies and effective engagements with the telecommunications industry
- Focussing on market-based solutions for sustainable outcomes, including piloting new approaches to meet local user needs but where the risks of innovation are high

- Supporting its own service delivery requirements, including around health, education, emergency services and transport
- Coordinating cross jurisdictional and Commonwealth engagement.

Connecting Victoria – a transformative investment across the state

The Victorian Government allocated $625.8 million over six years to the Victoria's Digital Future Now (VDFN) initiative to better connect Victoria's rural, regional and outer suburban communities to enhance remote working capabilities, create more local employment opportunities and increase the supply of professionals with digital skills across the economy (https://djpr.vic.gov.au/connecting-victoria/projects).

Two key components of the VDFN form the *Connecting Victoria* program which will deliver a range of broadband and mobile network improvements across Victoria. These components include:

- **Gigabit State Program (GSP) ($250 million)**

  GSP will deliver high speed business-grade broadband in more suburbs and regional towns across Victoria through different types of infrastructure, for example, upgrading a town from fixed wireless (FW) to fibre-to-the-premise (FTTP).

- **Mobile Connectivity Program (MCP) ($300 million)**

  The MCP will improve the quality and consistency of mobile coverage and remove mobile black spots from where Victorians live and work as well as accelerating the rollout of advanced services like 5G. The program will also focus on supporting essential coverage needed in disaster-prone areas.

The objective of the *Connecting Victoria* program is to drive regional economic and social development. Funding from the Connecting Victoria program will be targeted to priority connectivity gaps, informed by the state's nine Regional Digital Plans (refer **Appendix E**) as well as substantial stakeholder engagement to complement existing data sources and identify where the local lived experience does not meet community expectations. There is also an emphasis on ensuring businesses across the state are able to access business-grade services.

The Victorian Government is implementing this program as quickly as possible to support the State's economic recovery and address digital connectivity gaps. The state will engage with and seek to leverage Commonwealth Government funding programs where possible, and also calls on the Commonwealth to recognise and respond to this substantial state funding commitments and work together to support a transformational uplift in digital services and inclusion across regional and rural areas that still face connectivity issues.

5. KEY THEME 2 - IMPROVE EMERGENCY COMMUNICATIONS ACCESS

Relevant to Issues Paper questions: 2, 4, 5

Key Points

- The Commonwealth Government needs to develop a solution for emergency mobile roaming to improve access to communications services during emergencies like natural disasters and better support community safety.
- The Commonwealth Government needs to develop a national policy and program funding approach focussed on addressing the vulnerabilities of telecommunications to natural disasters, most significantly regarding the impact of power outages.
- The Commonwealth Government should commit to a major increase in direct subsidy funding available to improve emergency communications resilience through a program similar to its Strengthening Telecommunications Against Natural Disasters Program.

The Committee's issues paper asked how service reliability issues impact on regional communities and businesses and how outages, including in natural disasters, impact on communities and businesses. This section focuses on Victoria's experiences during natural disasters and the consequences for regional communities during those emergency situations.

The 2019-20 fire season demonstrated inherent limitations of communications networks across regional Victoria and vulnerabilities related to power outages and prolonged restricted road access which impacted the ability of communities to access emergency communications and information for extended periods.

For several communities these failures led to a loss of:

- Triple zero emergency communications.
- Personal critical communications to contact family and friends.
- VicEmergency app to keep up to date with developments.
- Text-based emergency alerts to get critical information as it developed.

Some of these communities also became physically isolated due to extended road closures, further increasing their vulnerability. Similar vulnerabilities were exposed in recent severe storm and flooding events in Victoria, again compromising power supply and leading to services outages.

- **Bushfires:** 324 telecommunications facilities were impacted in Victoria. 38 Victorian communities experienced a full or partial loss of communications with 17 of these communities being further isolated from road access and Triple Zero[6]
- **Severe storm / flooding event:** 500 NBN exchanges/nodes (affecting around 175,000 NBN services) and around 230 Telstra, Optus and TPG Telecom mobile towers were impacted. 49 communities were assessed as being isolated from Triple Zero[7]

Telecommunications services are provided by privately owned companies and regulated nationally by the Commonwealth Government, while the State is responsible for emergency management functions. Consequently, the policy and regulatory environment, and the relationship between carriers, the Commonwealth and the State, requires a cooperative and partnership approach established on the mutual best interests of assisting the community.

The Victorian Department of Jobs, Precincts and Regions has reviewed the issues that have emerged from these emergency events, which include:

- **Community insights** – better understanding of the ways in which local users rely on and expect resilient telecommunications services during emergencies.
- **Inherent vulnerabilities** – recent natural disasters have highlighted the coverage limitations of existing networks and the limited circumstances in which roaming for emergencies is enabled.

[6] Based on reporting provided by carriers to the State Control Centre during the fire season and recent storm/flooding
[7] Based on reporting provided by carriers to the State Control Centre during the fire season and recent storm/flooding

- **Network resilience** – the vast majority of telecommunications service vulnerabilities relate to power outages, and the related difficulties during natural disasters to access and restore these services, sometimes for extended periods.
- **Operational insights** – the scale of telecommunications outages during recent disasters has highlighted the lack of coordinated information available to understand where critical infrastructure is located across networks, and the consequence of critical assets being compromised.

The key take out from these insights is that much more needs to be done to address telecommunications network vulnerability and coverage issues in regional areas to support public safety during emergencies. Further information on these topics is provided at **Appendix D**.

Proposed actions

Emergency Roaming

Stakeholder advocacy regarding domestic mobile roaming (which is discussed more generally in **Section 7**) has emphasised the importance of this capability to support public safety during times of emergency.

The Victorian Government urges the Commonwealth Government to establish the technical, commercial and regulatory arrangements that would support multicarrier mobile access during emergencies. This could be termed 'emergency roaming', noting the State is neutral regarding the precise mechanism of achieving the required outcome and acknowledging there may be technical feasibility considerations requiring further exploration.

The rationale for considering implementing emergency mobile roaming has been emphasised by Victoria's recent experiences with natural disasters including bushfires and flooding. As outlined above, these events led to significant loss of services across impacted areas, disrupting community access to emergency information and communications for extended periods of time. The impact and stress of these emergencies on communities could have been partly mitigated if people could roam onto whatever mobile network was operational at a given time, rather than being reliant on just one network.

In circumstances where all mobile telecommunications networks serving an area were impacted, including the loss of triple zero services, emergency mobile roaming would not have assisted those communities.

However, in circumstances where one network was compromised but another was still operating, emergency roaming would enable people in those areas, regardless of which network they are a customer of, to maintain critical communications which includes the ability to access emergency alerts, emergency apps and coordinate with family and other community members during emergencies. This is how access to triple zero communications currently operates.

The Victorian Government notes that the Australian Competition and Consumer Commission (ACCC) has reviewed the issue of declaring domestic mobile roaming on several occasions. The case for mobile roaming has potential advantages and disadvantages which the ACCC has endeavoured to assess the relative merits of several times without supporting its implementation to date.

Despite this, the experiences of the last 18 months have provided unprecedented insights into the vulnerability of telecommunications networks and the significant reliance people place on them to access information and emergency services and communicate with family and friends during disasters.

On this basis the Victorian Government considers there is a strong rationale for the Commonwealth Government to implement mobile roaming during emergencies and determining the most suitable mechanism for achieving this. Previous ACCC reviews regarding mobile network roaming have been constrained by a restrictive scope of analysis unable to adequately consider and prioritise the public safety benefit mobile roaming during emergencies would provide.

Infrastructure hardening

The Victorian Government notes the Commonwealth Government's Strengthening Telecommunications Against Natural Disasters (STAND) program which was announced in the wake of the 2019-20 fire season and its impact on telecommunications services.

The STAND program has $37.1 million funding nationally to undertake infrastructure hardening activities and deliver backup satellite-based connectivity services in strategic community safety locations.

While the activities being undertaken through STAND are good, the level of funding allocated on a national basis is insufficient to address the scale of network vulnerabilities across Australia. The Victorian Government encourages the Commonwealth to build off this program and the successes to date to expand infrastructure hardening and resiliency improvement measures.

The Victorian Government considers that, at a minimum, all new base station deployments, particularly those supported by government funding, should have 12 hours of battery backup as standard. Other forms of resiliency measures should also be further explored as industry standards such as solar power backup, below-ground fuel tanks or satellite-based backup communications to serve local community centres.

The Victorian Government encourages the Commonwealth to build off its STAND program with a significant national investment towards these initiatives that can support continuity of services for a reasonable length of time until sites can be accessed and restored during emergencies. This activity could be funded through a direct subsidy commitment of the scale proposed in the previous section.

Another key issue relating to telecommunications resiliency during emergencies relates to the completion of the NBN network and the upcoming switching off of legacy networks. This transition will have implications for households with NBN services that do not have a battery backup solution available and therefore may increase the vulnerability of households during power outages.

Legacy telecommunications services based on the copper network were powered from the exchange, so that it was possible that a home phone would still operate even if the power to a house were cut off. It should also be noted that many businesses in regional settings have also held onto copper-based broadband services in preference to NBN wireless, meaning any switch off will potentially impact safety and business efficiency.

This issue requires strong community engagement to ensure households and businesses at the very least understand any changes to their communications resiliency during emergencies when legacy services are switched off, in combination with development of battery back-up options across different NBN connectivity options.

Public Safety Mobile Broadband

Public safety mobile broadband (PSMB) is another area of potential opportunity to improve regional telecommunications networks and better align government spending to improve emergency management communications and public safety. The Victorian Government joined other states and territories in December 2018 in endorsing (through the Council of Australian Government at the time) the Strategic Roadmap for the design, implementation and operation of a federated national public safety grade mobile broadband capability for first responder agencies.

The importance of establishing a PSMB capability in Australia has been ratified through Recommendation 6.4 outlined in the 2020 Royal Commission into National Disaster Arrangements, which calls for Australian, state and territory governments to expedite the implementation of PSMB.

Through consultation with the telecommunications market, a preferred service delivery model for PSMB has been identified and is currently being trialled over a 12 month period through a partnership arrangement between the NSW Telecommunications Authority (acting on behalf of all states and territories) and Nokia (who have also partnered with carriers TPG Telecom and Optus for the trial).

The key purpose of the trial is to validate that the preferred service delivery model for PSMB is capable of meeting the nationally agreed objectives and high level design requirements for PSMB. The trial includes a specific focus on the application and performance of 'emergency' mobile roaming of the PSMB service across commercial carriers and the provision of government owned dedicated spectrum for the purposes of PSMB. The implementation of multicarrier roaming and an allocation of dedicated spectrum have been highlighted, through a structured open market Request for Information process, as being key enablers for the implementation of a cost effective and high performing PSMB in Australia.

The implementation of PSMB in Australia will be the most significant advancement in public safety communications in decades, ensuring Victorians are kept safe in a rapidly changing environment by ensuring our emergency services have access to current technology platforms to improve operational efficiency and effectiveness. Further, PSMB will enable significant advancements in interoperable communications across emergency management agencies at both the state and national level. In this context, the US National Institute of Standards and Technology (NIST) produced a report in 2019 on public safety data interoperability.[2] This identified a key technical challenge:

> *The lack of a federated public safety identity, credentialing, and access management solution prevents data sharing technologies from providing inter-agency interoperability, even if technologies use standardized data.*

The national trial will investigate the suitability of a federated telecommunications capability and a successful trial would enable the nation to quickly shift to implementation planning and ultimate operations with greater certainty. Implementing the preferred PSMB model would likely address the significant technical challenges identified by NIST. That is, in the absence of a federated PSMB capability the ability of the nation's emergency services agencies to deploy emerging technologies to keep Victorian and all Australians safe is hampered.

So in the context of this review, an ability for 'emergency' multicarrier roaming across commercial networks is considered a critical enabler of PSMB, ensuring in particular that regional areas prone to natural disasters can be supported by emergency operations that have access to a resilient and reliable communication network. Leveraging commercial mobile networks as part of the supporting infrastructure for emergency services organisations is considered a more efficient, lower-cost and resilient architecture for PSMB network, improving the geographic coverage and resiliency of a PSMB service, ultimately benefiting the Victorian community.

The Committee should consider recommendations to the Commonwealth Government on the enablers for PSMB. Specifically, the need for an allocation of dedicated spectrum and consideration of regulatory arrangements that expand on the existing 'emergency' roaming arrangements that exist for 000 to also include PSMB and other community safety services such as Emergency Alert. Consideration would also need to be given to the planning of PSMB network coverage and the standards to which commercial mobile networks would need to meet this capability.

Furthermore, PSMB implementation considerations such as active or passive telecommunications' assets sharing, should be incorporated into Commonwealth mobile blackspot eradication or mobile coverage expansion programs. For example, wherever Commonwealth funds are made available (to expand carrier coverage), requiring commercial network providers to co-deploy PSMB capability alongside their networks would assist in the rapid deployment of PSMB.

6. KEY THEME 3 - FOCUS ON THE DIGITAL DIVIDE

Relevant to Issues Paper questions: 2, 7, 14, 15

Key Points

- With the completion of the NBN, the Commonwealth Government should turn its attention to other barriers to participation in the digital economy (noting 2.5 million Australians are not on the NBN).
- The Commonwealth Government should develop more targeted affordability measures that reflect how people use digital technologies, for example recognising the preference of low-income households for mobile over fixed-line internet services and device affordability.
- The Commonwealth Government should lead efforts to improve the quality of information and data available from telecommunications providers as well as support the technical capacity of local communities and local governments to enable on-going place-based analysis of coverage issues, along with a coordinated framework for considering affordability and ability gaps.

Digital inclusion is about access, affordability and ability

The Victorian Government uses the digital inclusion framework established in the *Australian Digital Inclusion Index* (ADII) reports which focus on three core pillars of access, affordability and ability as the necessary elements for digital inclusion.

Digital inclusion issues are often described in terms of the 'digital divide' – the gap between people with affordable access to digital technologies and those with very limited access or low digital literacy.

Access and affordability present barriers to digital inclusion, while an individual's digital engagement and confidence is also affected by digital literacy, including perceptions of relevance, motivation and concerns about safety.

To maximise the opportunities for regional and rural areas from the digital economy it is important these distinct but related aspects of digital inclusion are considered together.

Some cohorts face greater barriers to accessing and using technology

Disadvantaged cohorts include people in regional and rural areas who face more significant access issues. Other cohorts identified has as having lower levels of digital inclusion, including people aged over 65 and lower socio-economic groups, may also be disproportionately reflected in regional areas. Digital inclusion barriers can therefore be compounded for some places and cohorts in regional areas.

The 2020 ADII scored Melbourne's overall digital inclusion at 64.4 while rural Victoria's was 57.8. This overall divide was comprised of divides across all three digital inclusion dimensions of access (77.1 vs 73.0), affordability (62.5 vs 53.7) and ability (53.7 vs 46.8).

Digital access issues often get the most attention

A lot of attention regarding regional telecommunications is rightly focused on the quality of infrastructure access. The reasons for this are clear given that gaps in access are felt acutely by regional stakeholders. Issues of affordability and ability only become more relevant once access issues are addressed, underpinning the primacy often given to access issues.

Section 5 of this submission discussed various programs and activities at both the Commonwealth and Victorian state levels targeting access issues. These are important programs addressing access gaps and are an important priority of the Victorian Government.

However, the Victorian Government also considers it important that affordability and ability barriers are given appropriate attention at the national level. This is because of the ways in which all three elements can affect the realisation of benefits from investments in digital infrastructure which makes a broad conception of digital inclusion critical to supporting economic and social outcomes for people and communities.

Affordability issues have been revealed by the COVID-19 pandemic

The Victorian Government notes the Committee's Issues Paper discusses affordability barriers impacting regional and remote Indigenous communities and has invited input on this topic. This is an important issue for the Committee to explore, and which Victoria would encourage a broader consideration across all groups that may face affordability barriers.

Victoria's experience during the COVID-19 pandemic highlighted the hidden scale of this issue across the state. The Victorian Government encourages the Commonwealth Government to develop more targeted affordability measures that reflect how people actually use digital technologies, for example recognising the preference of low-income households for mobile over fixed-line internet services and the extent of technology/device needs for meaningful engagement in the digital economy

Further comments on this topic are provided in **Appendix A** against Question 7 of the Committee's Issues Paper.

Ability issues are multifaceted

Ability issues and their impact on regional stakeholder use, adoption and advocacy are multifaceted. They can relate to:

- the basic and more advanced skills needed to effectively use technologies (digital skills)
- the awareness and familiarity of technology needed to understand what options are available to consumers and business (digital literacy and awareness)
- the information needed for a business and community to understand their infrastructure limitations to be able to advocate for better connectivity solutions in their area (digital literacy and awareness).

Victorian stakeholders have advocated on all of these issues through a range of forums, including recent stakeholder engagement supporting the Connecting Victoria program.

Digital skills

The 2020 ADII measures digital ability across three components, assessing variables that include:

- Attitude, including notions of control, enthusiasm, learning and confidence
- Basic Skills, such as mobile phones, banking, shopping and information skills
- Activities, including accessing content, communications, transactions, commerce, media and information

A hypothetical person with 'perfect' digital skills would exhibit positive Attitudes, a high level of Basic Skills and undertake a wide range of Activities.

The 2020 ADII scored several key cohorts well below the Victorian average for digital ability. These include people in the fourth and fifth income quintiles, and people aged 65+.

There are a number of programs and activities that aim to lift digital skills, ranging from basic, individual digital literacy support, to more advanced technology skills supporting businesses and industries.

Digital literacy and skills training support can be accessed through a range of avenues. For example, the Victorian Government supported Learn Locals as well as public library digital learning initiatives.

The Victorian Government also runs programs that support digital skills and technology adoption for small businesses, including the Small Business Digital Adaptation Program, Upskill My Business, and various digital capability workshops.

Both the Commonwealth and Victorian Governments are also delivering programs to support people into digital careers, including the Victorian Government's Digital Jobs Program and the Commonwealth's Digital Skills Cadetships Trials. These programs will help build the digital skills pipeline able to assist business adoption and adaption to technology developments.

Digital skill needs vary significantly across industry and user groups which can also make it difficult to understand the specific gaps and areas requiring support from place to place. For example, the Victoria's On-Farm Internet of Things (IoT) Trials is a program that aims to address the technology knowledge and connectivity gaps specific to the agriculture sector (see case study below).

The activities described above are not exhaustive of all digital skills and literacy activities but do offer a snapshot of the various types of digital skills support that seek to address needs across the state, including regional areas. Digital literacy and skills continue to be an active area of policy and program interest across the Victorian Government and Victoria is engaged on this topic through the Australian Data and Digital Council.

Industry digital capability and awareness - Digital Agriculture Case Study

The Victorian Government's $12 million On-farm Internet of Things (IoT) trials program has been designed to support adoption of IoT technologies in Victoria's agricultural sector by addressing key barriers to on-farm uptake of these technologies, including through the provision of on-farm network connectivity, access to technologies and expert advisory support.

The trial is supporting more than 330 farmers across five regions (Wellington Shire, Buloke Shire, Loddon Shire, the City of Greater Shepparton and parts of the Moira Shire) and four farm types (dairy, horticulture, grains and sheep, including mixed farms) to become IoT enabled.

As part of the trial, long range wide area network (LoRaWAN) connectivity was delivered to farms across the trial regions to support the deployment of IoT devices. The trial also supported participants to access a range of IoT devices with different connectivity requirements, specifically, 3G/4G, Wi-Fi and other bespoke radio-based networks.

The program includes establishment of a local technology expert in each trial location who is available to provide advisory support to participating farms as they explore different IoT technology options relevant to their farming activities.

This program highlights the important interplay between different elements of digital inclusion to deliver the full benefits of digital technologies. IoT network connectivity alone is not enough, support to understand new technologies and sometimes financial support to re-risk early experimentation and adoption are also important to support take-up.

The Commonwealth Government has identified Health and Agtech issues for further investigation of digital barriers and has sought advice from the Australian Broadband Advisory Council. This approach could be broadened to take in other sectors and to focus specifically on the uptake and usage of digital, cloud-based services (cloud-connected and cloud native) by individuals, small and medium enterprises, larger businesses and government institutions in regional areas.

Digital literacy and awareness – supporting technology adoption

Another aspect of ability relates to digital literacy and awareness levels across regional communities and businesses regarding technology and infrastructure options.

The Victorian Government notes this is an area of particular interest to the Committee, with the Issues Paper seeking input on how regional consumers can be better supported to identify, choose and use the best connectivity for their circumstances. The Victorian Government understands several programs were implemented since the last RTR review in response to this issue. Despite this, there has been continued regional stakeholder advocacy seeking further support on this issue, suggesting the challenge at this point may be less about the absence of suitable programs and more about community awareness to engage with available support. Further comments are provided in response to Issues Paper question 14 at **Appendix A**.

Digital literacy and awareness – adequacy of public information

The Committee's Issues Paper also asks to what extent public information on connectivity options, including predictive coverage data and speeds, is sufficient to help regional customers make informed decisions.

The Victorian Government notes that the issue of public coverage maps and service quality data is a longstanding frustration that has been raised in the last RTR process as well as in other reviews such as by the ACCC in respect of its review into domestic mobile roaming.

The Victorian Government considers that better quality coverage and service performance data from industry is needed to support consumer and business decision making, community advocacy and funding prioritisation. Despite this issue arising consistently, there has been little progress to date.

The Victorian Government encourages the Committee to highlight this issue and the need for more informative coverage maps and consumer-level information to help users understand the true performance of networks from place to place. Further comments on this issue are provided in response to Issues Paper question 15 at **Appendix A**.

Digital literacy and awareness – digital planning

The ability of key regional stakeholders to be well informed about their existing digital infrastructure landscape, how this may fail to meet their business and community needs, and a view on what better connectivity option could meet their needs is another important aspect of digital literacy which the Victorian Government is working to address.

The Victorian Government has supported a project to help address this issue and better inform local communities, businesses, and governments about infrastructure gaps. This was done through the development of a set of Regional Digital Plans, one for each of Victoria's nine Regional Partnerships. Further background to the Digital Plans project and its outcomes is provided at **Appendix E** for the Committee's consideration.

The Victorian Government considers that high-quality, place-based information on infrastructure supply and demand is important to help industry, regional stakeholders and all levels of government to best plan for and prioritise funding to address gaps. Clear articulation of regional communities' digital needs and gaps provides a great incentive for industry response and basis to form partnerships to work towards solutions.

The Victorian Government would encourage Commonwealth Government led efforts to improve the quality of information and data available from telecommunications providers to support on-going place-based analysis of coverage issues, along with a coordinated framework for considering affordability and ability gaps. Such analysis requires a sustained commitment to update information and interpret the relevance of market and technology developments. There is a clear role for the Commonwealth to support the technical capacity of local communities

and local government to sustain this work, and not just expect business plans to materialise when funding programs are announced.

The recent report of the Agri-Tech Expert Working Group of the Australian Broadband Advisory Group has spelt out an ambitious plan the draws together the threads of access, affordability and capability with a strong focus on information and planning.[8] It concludes that:

> *The desired future state has three main elements:*
>
> - *fibre highways across the country with back haul off-ramps into every rural community*
> - *every rural town or area has a locally developed connectivity plan that connects their off-ramp to a range of place-based, locally supported infrastructure*
> - *government investment to achieve this takes place within a long-term, intergovernmental planning framework, and which is complementary to business investment. (p.7)*

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

7. OTHER ISSUES RELEVANT TO REGIONAL DIGITAL POLICY AND PROGRAMS

Relevant to Issues Paper questions: 9, 11

Key Points

Multi-carrier solutions / Carrier-neutral solutions

- The Victorian Government is supportive of ways in which the availability of multicarrier telecommunications solutions in regional areas can be improved, with an emphasis on where government subsidy is provided to improve coverage.
- The Victorian Government encourages the Commonwealth Government to continue to explore and support innovative models that can achieve multicarrier outcomes including through carrier-neutral solutions.

Domestic mobile roaming

- The Victorian Government would support domestic mobile roaming if the Commonwealth Government and industry were able to resolve the potential implications on infrastructure investment and competition, the main reason preventing its implementation in the past.

Leverage infrastructure builds

- Better coordination of infrastructure investments across regional and rural areas could reduce the cost of delivering telecommunications infrastructure and capacity upgrades, bringing high-capacity fibre deeper into more marginal markets.

Telecommunications service standards

- There is a need to review the adequacy of the USG noting that the Victorian Government has received consistent advocacy from regional stakeholders on the effectiveness of these existing service standards.

Multi-carrier solutions / Carrier neutral services

The Victorian Government is supportive of ways in which the availability of multicarrier telecommunications solutions in regional areas can be improved. Mobile network roaming could be one potential mechanism to enable this, but it is not the only one. There may be other mechanisms that can achieve the desired outcome with less contentious implications for private sector investment in regional markets, such as through carrier-neutral services.

Carrier-neutral mobile infrastructure providers offers a potential avenue to deliver better regional market outcomes where single or competitive carrier investment is lacking and may be able to better support the availability of multiple carriers in marginal regional areas with benefits for consumer choice and public safety.

The Victorian Government also considers it important to encourage multicarrier access arrangements in areas where government subsidy has been required to incentivise market investment. The requirement for government subsidy in some regional areas highlights where private sector investment alone has not been able to meet community needs. Government investment in such areas should be delivered with a preference for multicarrier outcomes to maximise value to local communities and businesses.

In the case of fixed-line services, the Victorian Government has entered into arrangements in regional areas with NBN Co to create carrier neutral business-grade solutions.[9] In this case, an investment by the Victorian Government means that Retail Service Providers will be able to offer approximately 10,000 Victorian businesses located within eleven identified outer metro and regional areas business-grade fibre connections at no upfront build cost. The project is carrier neutral in that the Retail Service Providers compete by offering services using a single network built by NBN Co.

The Commonwealth has started to recognise the benefits of wholesale in its award of funding to a regional focussed mobile operator, Field Solutions in Round 5A of the Mobile Black Spot Program.[10] There is potentially

[9] NBN Co press release "NBN Co and Victorian Government announce combined investment to lift the digital capability of Victoria" available at <https://www.nbnco.com.au/corporate-information/media-centre/media-statements/nbn-co-and-victorian-government-announce-combined-investment-to-lift-the-digital-capability-of-victoria> accessed 1 September 2021.

[10] The program is summarised at <https://www.communications.gov.au/what-we-do/phone/mobile-services-and-coverage/mobile-black-spot-program> accessed 1 September 2021.

significant scope to build off this to ensure that regional Victorians receive the range of services they should reasonably expect access to.

To deliver these multicarrier outcomes, there is a need to encourage and explore alternative business models that can deliver these outcomes, such as through businesses like Field Solutions Group and Zetify. The challenge facing the Commonwealth is the need to think laterally about solutions from smaller businesses with a regional and rural focus where previous programs and funding criteria have not prioritised such projects.

The Victorian Government encourages the Commonwealth Government to continue to explore and support innovative models that can achieve multicarrier outcomes in regional markets.

Domestic mobile roaming

The Victorian Government has heard advocacy from a range of regional Victorian stakeholders in support of implementing domestic mobile roaming in response to community frustration and concerns regarding the lack of coverage from multiple carriers across regional markets. The Victorian Government acknowledges the importance of this issue to regional stakeholders and their access to mobile telecommunications services, particularly during times of emergency which has been discussed in **Section 5**.

The adequacy of regional telecommunications in meeting diverse user needs and commercial investment incentives, shaped by Commonwealth Government regulatory and legislative settings, are a complex market. Victoria notes that the Australian Competition and Consumer Commission (ACCC) has reviewed the national competition issues of domestic mobile roaming on several occasions without supporting its implementation to date. This was ultimately due to the concern that regulating domestic mobile roaming was considered too great a risk to impeding private sector investment and competition to expand their networks in regional markets.

The Victorian Government understands that the ACCC is soon to release a report detailing carrier investment in mobile networks since the last ACCC review of domestic mobile roaming in 2017. This report should demonstrate whether there has been continued investment competition among carriers since the last review.

The Victorian Government supports the ACCC taking into consideration the continued regional stakeholder advocacy on this issue, along with the findings of its forthcoming report into regional mobile network investment to further consider the case for domestic mobile roaming. Consideration might be given to ring fencing subsidised regional and remote markets, or prescribing other conditions when it is activated, such as during natural disasters.

The Victorian Government would support domestic mobile roaming if the Commonwealth Government and industry were able to resolve the potential implications on infrastructure investment and competition.

Leveraging infrastructure builds

Regarding the Committee's Issues Paper question on *how Government can better support the rollout of telecommunications solutions in regional areas*, one potential approach could be to better coordinate regional infrastructure investments to identify where telecommunications infrastructure can be extended into underserved areas. There may be opportunities to significantly reduce the cost of high-capacity telecommunications fibre deployments when investments into electricity and transport networks are being made, as examples.

Doing so would require government leadership and coordination during the planning stages of large-scale regional infrastructure projects involving both the public and private sectors to consider the adequacy of telecommunications infrastructure in the areas that these projects are taking place. The opportunities to be exploited include leveraging both:

- the telecommunications networks deployed directly for these investments (such as communications networks required for electricity and rail management) and where co-investment by carriers could increase the capacity of fibre deployed, and
- the opportunities to leverage civil works (such as open trenches and new conduits, tower and pole infrastructure) to reduce the cost of deploying fibre.

Given the right commercial framework and market engagement (and potentially subsidy) there is the opportunity to significantly reduce the cost of fibre deployments in underserved and costly regional markets, that could benefit multiple users (such as transport, electricity, NBN and mobile carriers). There are immediate examples of these opportunities apparent in the rapid growth of the renewable energy supply network that requires upgraded distribution infrastructure (including communications for network management), and in cross jurisdictional rail upgrades.

A related issue that could be addressed by the Commonwealth is the existing regulatory constraints on commercialisation of electricity communications links (much of it in the high voltage distribution network). The Victorian Government has in the past successfully leveraged rail upgrades and its railway easements to deploy fibre optic capacity into regional markets for broad commercial use with the effect of dramatically changing telecommunications access in those markets. Such an approach is supported by the findings of the Agri-Tech

Expert Working Group of the Australian Broadband Advisory Group that has recently called for measures to build "…fibre highways across the country with back haul off-ramps into every rural Community."[11]

Telecommunications Service Standards

There are outstanding questions about the efficiency and consistency of approaches to the setting and relevance of minimum telecommunications standards that require the Commonwealth Government's ongoing attention.

The Statutory Infrastructure Provider regime legislated in 2020 underpins the Universal Service Guarantee (USG), meaning NBN Co in the main has the statutory obligation to provide broadband services that are able to achieve peak download and upload speeds of at least 25/5 megabits per second. NBN Co must also provide at least 90 per cent of premises on its fixed-line network with peak broadband speeds of 50/10 Megabits per second.

The 2020 legislation was a significant shift as it expanded the minimum standards by creating a guaranteed access to broadband as well as voice services, while also ensuring current fixed telephone and payphone services are to be maintained in rural and remote areas that were required under the Telecommunications Universal Service Obligations.

There is an ongoing need to review the adequacy of the USG noting that the Victorian Government has received consistent advocacy from regional stakeholders on the effectiveness of these existing service standards, raising the following range of issues:

- The basic parameters of the USG allow for a lot of sub-par connectivity. Improving regional network performance is critical to give meaning to the statutory obligation.
- Mobile connectivity is practically the most meaningful base-service for many low-income subscribers, but these are not subject to the same level of quality-of-service requirements as fixed line services (noting that 2.5 million Australians are not connected to the NBN). Telecommunications service standards need to align with community expectations and lived experience.
- The availability of mobile network services during emergency events, highlighting the ongoing need to remove blackspots and enable multi carrier access.
- USG NBN services are subject to catastrophic disruption in natural disasters (particularly if there are prolonged power outages).
- The ongoing maintenance of better than NBN services over old fixed-line infrastructure will not be supported (copper line services). If these services cannot be maintained in the longer term there will be significant pressure to upgrade the USG, particularly for business users where wireless services are problematic.

[11] Agri-Tech Working Group of the Australian Broadband Advisory Council, 2021 (p.7).

APPENDIX A – RESPONSES TO ISSUES PAPER QUESTIONS

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

   Refer to **Section 2 – Digital Context: Changing community expectations** and **Section 3 – The problem**. Essentially, the Victorian Government considers that lower quality NBN services including Satellite and Fixed Wireless as well as 3G mobile networks are largely unable to meet business and community needs in regional areas, and current and emerging technologies are better suited to modern and future requirements.

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

   Discussed throughout the submission, and in particular refer to:

   - **Section 2 – Digital Context: Changing community expectations**
   - **Section 3 – The problem**
   - **Section 5 – Emergency communications**
   - **Section 6 – Focus on the digital divide**

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

   Refer to **Section 4 – Sustain Investment** for a discussion on how existing Commonwealth programs can be improved.

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

   Refer to **Section 5 – Emergency Communications** and **Appendix D** regarding the impact of recent natural disasters on telecommunications.

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

   Refer to **Section 5 – Emergency Communications** and **Appendix D** regarding the impact of recent natural disasters on telecommunications.

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?**

   Refer to **Section 2 – Digital Context: COVID-19 has accelerated economy-wide digitalisation**.

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

   This is an important issue for the Committee to explore, and which the Victorian Government would encourage a broader consideration of across all groups that may face affordability barriers.

   The COVID-19 pandemic revealed a stark gap in the availability of necessary digital devices and data capacity for many households to shift to an online environment. The Victorian Department of Education and Training loaned or provided more than 71,000 devices and 28,000 internet access services to support online, home-based learning for students who lived in households where there were no or insufficient devices and no or limited access to data due to issues of affordability.

   This disparity in household device and data affordability was relatively obscured before the pandemic but became acute and obvious as it continued.

   This experience highlighted the potential for significant affordability barriers to be impacting access to and use of digital technologies which is unlikely to be limited to households with school-aged children.

   While there is evidence of the greater financial strain technology affordability has on low-socio economic households, there is limited understanding of how affordability issues manifest for these groups in terms of how they adopt and use digital technologies and their ability to meaningfully participate in the digital economy. Some programs across government and industry help support affordable access, including:

   - Commonwealth Government Telephone Allowance
   - In-built cross-subsidies in the NBN network to establish uniform wholesale pricing across markets
   - Free public WiFi networks, including through state, local government and local library and digital hub initiatives, which can support additional data allowances for people on restricted caps

- Industry measures such as Optus' Donate Your Data in partnership with The Smith Family and The Salvos.

Victoria has advocated for the Commonwealth Government Telephone Allowance Scheme to be reviewed and expanded to better reflect the cost of accessing internet services for low-income households, through the Australian Data and Digital Council.

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

   Refer to **Section 2 – Digital Context: Regional economic development opportunity**, as well as **Section 7 - Leveraging infrastructure builds** .

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

   Refer to:

   - **Section 4 – Sustain Investment**
   - **Section 7 - Multi-carrier solutions / Carrier neutral services**
   - **Appendix B regarding emerging market developments**

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

    Refer to **Appendix B** regarding emerging market developments.

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

    Refer to:

    - **Section 4 – Sustain Investment**
    - **Section 7 - Leveraging infrastructure builds**

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

    Refer to **Section 4 – Sustain Investment** regarding more significant funding, over longer time-frames with more time built into program rounds to support market formation and coordination.

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

    Refer to **Section 4 – Sustain Investment**

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

    The Victorian Government recognises the importance of this issue and notes that Victorian regional stakeholders have advocated for better support and information to help make such technology adoption choices. This has included specific advocacy for an independent advisory service that can assist regional users to explore their connectivity options. This has been highlighted by the Agri-Tech Expert Working Group of the Australian Broadband Advisory Group and is being addressed through the Agriculture Victoria IoT pilot program (refer page 29).

    The Victorian Government is aware of several initiatives managed by the Commonwealth Government that are aimed at supporting better understanding of technology options. This includes the *Digital Solutions – Australian Small Business Advisory Services* program and the *Regional Tech Hub*, an initiative of the Department of Infrastructure, Transport, Regional Development and Communications (DITRDC) and delivered by the National Farmers Federation working in collaboration with ACCAN. The *Regional Tech Hub* initiative resulted from the 2018 RTR and recommendations.

    Anecdotally, there may be limited awareness of these initiatives among regional stakeholders given continued advocacy on this issue and the desire for assistance like that provided by these programs. The Victorian Government would encourage the Committee to examine with the DITRDC the utilisation of these programs since their inception and how they could be better promoted and accessed among regional users.

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

In developing the Victorian Regional Digital Plans, as well as through implementation of successive rounds of mobile black spot funding, it has become apparent that there is a disconnect between what public coverage maps say regarding network coverage and the lived experience of local users. This particularly relates to coverage quality, where seemingly well-served areas based on public coverage maps are actually reported by local users as patchy or unreliable.

Sometimes the lived experiences of users reflect issues with user equipment and challenging places to deliver services (such as old handsets or penetrating dense buildings and topographically challenging terrain). However, sometimes these lived experiences demonstrate a shortcoming of public coverage maps and the modelling used to estimate coverage.

Better coverage data is needed to accurately reflect the lived experience of users across regional, rural and outer suburban areas to help prioritise funding, better inform advocacy and reflect the true extent of service issues. In its 2017 review of mobile roaming, the ACCC advocated for industry to provide better transparency about network coverage and quality as one of several identified areas for improvement that could deliver better outcomes for regional consumers. It is unclear whether this issue has been addressed by industry.

In order to support the implementation of the Connecting Victoria program, the state is undertaking an extensive community engagement process to better understand these lived experience challenges. This engagement is important to support a place-based prioritisation and delivery approach, but also necessary given the difficulty of identifying which areas across the state would address coverage issues given the limitations of available data. Already this engagement has received 5,600 contributions from community on the location of their service issues.

This should also importantly include network performance in popular tourist areas during peak season. The state has consistently received advocacy on network capacity constraints that are experienced by local residents, businesses and visitors during seasonal visitor influxes in many popular areas.

Such information could help users understand whether their connectivity issues are likely a reflection of their own equipment issues or really the result of inadequate coverage in the area. It would also help consumers make more informed choices about which carrier provides the best service to meet their needs.

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

Discussed throughout this submission.

APPENDIX B – FURTHER DISCUSSION OF CHANGING INDUSTRY DYNAMICS

Recent and emerging telecommunications market developments present potentially new market dynamics with implications for regional consumers and businesses. Some, but not all, of these developments include:

- The separation and sale of telecommunications infrastructure assets

  Telstra recently sold a minority stake in its InfraCo Towers business with Optus progressing its own plans to sell a majority stake in its mobile tower infrastructure. There are reasons to consider that these changes may be either neutral, positive, or negative for future regional telecommunications market investment, including preparedness of tower infrastructure companies to partner with governments to expand and improve coverage, and maintain access arrangements to enable service continuity for the expected period. This development may also amplify the emergence of carrier-neutral infrastructure providers, discussed below.

- The emergence of carrier-neutral infrastructure providers and technologies

  Described further below, these developments have the potential to achieve similar outcomes to mobile roaming capabilities in thin regional markets which would generally be characterised by investment by only one carrier or none.

  These 'wholesale' tower providers may be able to make previously non-commercial markets more attractive by being able to rent the infrastructure to all three carriers. This model may also become a preferred approach for government subsidised mobile network coverage, which historically has only funded new coverage by one carrier in each supported location.

- An array of smaller telecommunications infrastructure providers with bespoke offerings

  The Victorian Government's recent experience with Round 1 of the Regional Connectivity Program highlighted a number of smaller telecommunications services providers ready and eager to deliver smaller, bespoke networks to address specific regional user needs, such as on-farm coverage to enable IoT. Such providers could offer better approaches to address longstanding and seemingly intractable service gaps.

  The challenge for government is to be able to support these developments and innovative approaches, while recognising these providers generally do not have the same history of performance and financial strength as larger providers that have predominantly secured government funding for telecommunications network improvements.

  An additional issue is how government can assist community and or industry-based self-help, where extremely small-scale but nonetheless meaningful improvements can be organised and implemented by community organisations representing small towns and dispersed rural populations.

- NBN Co preference away from fixed wireless network configurations

  On the basis of not having a clear wireless upgrade path as in the mobile LTE networks, the Victorian Government assumes that NBN Co has a preference to move away from any future investments into its fixed wireless network given this network is loss making and requires cross-subsidy from its fixed line network areas. This is reflected in NBN Co's preference through its Regional Co-Investment Fund to convert satellite and fixed wireless areas directly to fixed-line services by investing in fibre optic cable to reduce operational costs, requiring other government co-investment to ensure NBN Co achieves a minimum commercial rate of return from its investment.

  This means that a potential upgrade path for regional locations currently on alternative wireless solutions (such as cheaper satellite and LTE upgrades) (to fixed wireless) is unlikely to occur, and these areas need to be commercially viable before NBN Co will upgrade them to fixed-line infrastructure. This reality suggests that satellite areas not on NBN Co's future upgrade path are unlikely to meet the commercial investment parameters needed to warrant their transition to fixed-line services.

- New commercial low earth orbit satellite service providers

  The biggest connectivity challenges for the NBN in terms of meeting household and business needs, relates to their satellite and fixed wireless services. Programs and investments are being made to upgrade some of these locations to fixed-line services like fibre-to-the-premises, including through the Connecting Victoria program, the Commonwealth Government's Regional Connectivity Program and NBN Co's Regional Co-Investment Fund.

Despite these programs, many places will not be upgraded and will continue to face the limitations of these lower-quality services. However, the emergency of low earth orbit (LEO) satellite services, as an example, provides a potential avenue for many regional users to access better quality services. The latency and speed of these services appears much better than traditional satellite services, and potentially can be integrated with other infrastructure to lower backhaul costs, however prices at the moment are significantly higher than services over the NBN and they are not available in all locations yet.

A better outcome for regional users may be NBN supporting access to these services, rather than continuing with their own satellite services. However, it is unclear how new – and potentially more efficient and capable – technologies will emerge without a clear government direction in regional areas (particularly in subsidised markets).

- Future privatisation of NBN Co

While not expected to occur for several years, the eventual privatisation of NBN Co will have significant implications for regional telecommunications users noting the cross subsidies that are required within the NBN network. This is particularly the case when considering the future impact of new technologies like LEO satellite services and high-capacity mobile networks like 5G. These developments may place increasing pressure on marginal NBN Co services like satellite and fixed wireless in particular, and with changing commercial incentives, this may adversely impact users of those services. How NBN Co is able to respond to these developments, and what it may do to fixed wireless services for example in high-cost, low-return markets, will have important impacts on regional users.

The Victorian Government notes the requirement for the Productivity Commission to undertake a review of the NBN before a privatisation process can begin, including a specific focus on regional telecommunications markets, which needs to be broad enough to consider issues like these.

- Expected 3G switch off in coming years and deployment of 5G networks

Telstra has announced plans to switch off its 3G network by 2024. Telstra has indicated that by then its 4G network will provide coverage wherever its 3G network is currently available. Despite this, regional stakeholders have expressed concern about the implications of this development of service availability in their area.

Meanwhile the major mobile network operators are picking up the pace of their 5G mobile network deployments. These deployments will, as with past rollouts, target the more dense, commercial markets first and expand outwards. The important question for regional users is how far they will penetrate regionally and by what time frames, as well as what the capability of a regional 5G network will be compared to a metropolitan 5G service noting the different frequencies and network configurations that can be used from place-to-place.

There are clear opportunities from this development for regional users, with the potential for some users that have struggled with home internet quality to get access to a new high-capacity 5G service. However, it is too early to tell the extent of competition between carriers that will emerge in thin markets and the need for government action to support this.

APPENDIX C – PREVIOUS VICTORIAN GOVERNMENT DIGITAL CONNECTIVITY INITIATIVES

Prior to the 2020-21 Victorian State Budget commitment to Connecting Victoria, the state had also invested over $130 million since 2015 to address a range of localised digital connectivity issues supporting: regional economic development, social inclusion and living standards.

These activities have piloted a range of digital connectivity, digital inclusion and research activities to lift Victoria's digital landscape working in partnership with the Commonwealth Government but also to deliver outcomes beyond what has been possible through national policy and program settings.

The funding has delivered significant improvements across regional Victoria, including:

- Mobile black spots

  The Victorian Government has invested $56 million into mobile black spot programs, combined with Commonwealth and industry co-funding, securing 243 new mobile base stations providing 8,000 square kilometres of new coverage including new or better coverage for 28,000 regional premises.

- Public WiFi

  The state has piloted free public WiFi networks that span the Melbourne CBD and the CBDs of the regional cities of Ballarat, Bendigo, Geelong and Shepparton, with further work in development to deliver public WiFi networks in Ararat and the Latrobe Valley.

- Regional rail connectivity improvements

  Through the Regional Rail Connectivity Program (RRCP) and in partnership with industry the state has funded the establishment of 35 new mobile towers and signal repeater technology on 88 VLocity trains.

- Business-grade broadband enhancements

  The Victorian Government's Enhanced Broadband program has piloted the delivery of new high-capacity business-grade broadband services better than those available from the NBN to support the connectivity needs of businesses in Horsham and Morwell.

- IoT networks for agriculture

  The state's On-Farm Internet of Things Trial has been trialling the delivery of IoT networks and supporting the adoption of IoT technologies across farms in Tatura (Horticulture), Serpentine (sheep), Maffra (dairy) and Birchip (grains).

- Digital economy initiatives

  The state has supported digital technology skills and capability initiatives such as the Digital Innovation Festival (https://dif.vic.gov.au/) and the SummerTech LIVE program to drive innovation and increase the competitiveness of regional industries. The state developed the Regional Digital Fund for small-scale digital projects with local government and other regional stakeholders. The Fund has supported the development of a broad range of projects including digital hubs, digital skills and training, telehealth and local government digital planning.

APPENDIX D – FURTHER INSIGHTS ON EMERGENCY COMMUNICATIONS

Community insights

- communities now have much greater reliance on telecommunications services during emergencies which has heightened the significance of network vulnerabilities, including during fires, the pandemic and floods
- community expectations for reliable and resilient communications have increased significantly, with a succession of significant events amplifying community concerns
- quality of services is an important consideration in the emergency management context, which has been highlighted by the rapid shift to online activities during pandemic and the preference of many to access emergency information online through mobile devices

Inherent vulnerabilities insights

- There are three mobile network carriers all of which have their own coverage gaps and operate separate networks with their own customers. During emergencies the ability to maximise network coverage available to all people, such as through mobile network roaming, would significantly improve access to emergency information and community safety.
- Mobile network roaming is enabled for triple zero calls in Australia. However, this does not extend to other forms of emergency communications like SMS emergency alert warnings, accessing the VicEmergency app or websites. This reduced the effectiveness of emergency services organisations to communicate with the public. There is an inherent disincentive in the communications sector to better sharing of service capabilities, such as network roaming, as a key source of competitive advantage for carriers is the quality and reach of their respective networks.

Network resilience insights

- Service outages predominantly resulted from the large-scale loss of mains power to communications infrastructure and prolonged restricted road access, highlighting the reliance on the same infrastructure leading to common points of failure across networks. The availability of alternative emergency communications, such as satellite phones with backup power, in communities at risk of losing services or road access can provide an important form of communications resiliency in future emergencies.
- There was limited understanding of critical communications infrastructure before and throughout the fire season, including what types of backup power infrastructure was in place across networks and how long services would last after a loss of mains power. Better understanding of this information in future can support resource allocation and prioritisation to the most vulnerable areas.

Operational and information coordination insights

- Carriers do not provide reliable and comparable coverage information and consequence information which impacts emergency management planning and responses. There is a need to move towards better sharing of geospatial coverage information to support emergency preparedness and response.
- There is an inconsistent approach to reporting across telecommunications carriers on their service outages during emergencies. Better alignment would provide more clarity for emergency management organisations to understand the impact to communities from infrastructure outages.

APPENDIX E – BACKGROUND TO VICTORIAN REGIONAL DIGITAL PLANS

The Digital Plans are owned by each of Victoria's nine Regional Partnerships, forming the evidence base to underpin their advocacy and prioritisation of telecommunications needs to different levels of government and to business and community leaders.

These plans established for the first time a well-grounded, common evidence base on digital infrastructure through an analysis of telecommunications supply and demand conditions across regional Victoria. The place-based approach, based on Regional Partnership areas, was a departure from previous approaches to regional telecommunications development that was generally implemented at a national scale with a single set of rules.

The Regional Digital Plans developed detailed place-based evidence to enable regional actors to better articulate and address their unique or specific local issues and needs, while identification of the scale and scope of common issues across the state informs government at all levels and industry about what the best strategies might be. This level of information had not been available before and was a barrier to efficient policy and investment decisions. A copy of the Regional Digital Plans are available through the respective Regional Partnership websites which can be accessed at https://www.rdv.vic.gov.au/resources/digital-plans.

The Regional Digital Plans project delivered a range of benefits, including:

- establishing a common evidence base and analytical framework to discuss regional connectivity issues
- promoting a more nuanced understanding of place-based connectivity issues and needs, highlighting the limitations of one-size-fits-all approaches
- developing a network of engaged regional stakeholders with greater understanding of their local digital connectivity challenges
- establishing a governance forum through which local priorities could be identified and fed into funding programs such as the Mobile Black Spot Program
- raising the standard of community discussion and advocacy on connectivity issues
- providing a starting point for identifying local priorities.

There were also challenges, limitations and learnings revealed in undertaking the project. These included:

- available data does not necessarily reflect the real lived experience of local users, for instance public coverage maps of mobile networks tend to show all population centres well served despite many local residents complaining of poor quality coverage
- the currency of data, realising that technology developments and continued investment rendered the point-in-time analysis of Digital Plans quickly out of date
- recognition that regional digital planning is a process requiring ongoing engagement, with the technology landscape and local priorities and expectations shifting over time, and to be focussed on long term regional outcomes rather than funding opportunities
- local engagement and prioritisation is influenced by engagement of strong local advocates
- Digital Plans on their own are insufficient to prioritise funding, stakeholder input on their local priorities is a critical overlay
- Digital Plans empower local communities to address connectivity issues with the telecommunications industry with more authority
- issues of affordability and ability were difficult to incorporate into the Digital Plans due to their complexity and lack of primary data sources to inform gaps
- detailed digital planning takes significant time and resources and could be better sustained through more accessible and current data and information through an online data visualisation platform which would enable interested stakeholders to undertake their own analysis.

Since their development, Digital Plans have been used by Regional Partnerships, local stakeholders and the Victorian Government to support:

- the identification of local investment priorities to attract program funding
- engagement with carriers on coverage gaps and local priorities
- advocacy to the State and Commonwealth Governments on local priorities and persistent gaps.

A mechanism to make the information needed for effective digital planning more readily available to local governments and other stakeholders to assess connectivity issues and priorities would be useful and could support more informed priorities and funding allocation in future. This would be particularly valuable as more obvious and pressing connectivity gaps are progressively addressed while difficult, costly and less apparent places continue to face connectivity issues.