Better delivery of universal services Discussion paper

NBN Co submission

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Contents

1. **nbn** supports universal service policy reform

- **nbn** welcomes the Australian Government's focus on reforming universal service policy and regulation to improve outcomes for all Australians, and recognises the important role **nbn** needs to play.

- Since universal service policy was first introduced, there have been significant industry changes. The national provider is no longer a vertically-integrated operator of a voice network. Australia is now served by **nbn** – a wholesale-only broadband network with voice being one of many applications operating over it – as well as a range of other fixed, mobile, and satellite networks. Industry changes will continue into the future, with the decline of copper and other legacy networks, the end-of-life for **nbn**'s Sky Muster satellites in the early 2030's, and the ongoing deployment of new and innovative technologies.

- It is therefore critical to consider how Australians, particularly those in regional, rural, remote and isolated areas, should best be served using modern technologies, and what universal service policy should require going forward.

- Future universal service policy should have a single service obligation ensuring access to baseline broadband and voice for all Australian premises. The Statutory Infrastructure Provider (**SIP**) regime goes a long way towards achieving this objective. It requires **nbn** to deliver broadband across Australia and to support voice on fixed-line and fixed wireless networks. The regime could be updated in future to accommodate Low Earth Orbit (**LEO**) satellite-based services, provided that appropriate technical, commercial, operational and security arrangements can be put in place.

- Universal service reforms would need to be supported by updated consumer protections:

  o The existing protections were put in place when landline voice services were the focus, to address concerns that there were insufficient incentives for a vertically-integrated operator to connect and repair services promptly, putting continuity of connectivity at risk.

  o The same concerns do not arise under the **nbn** model. As a wholesale-only operator, **nbn** has strong incentives to continue to improve service levels through its Wholesale Broadband Agreement (**WBA**), underpinned by the Benchmark Service Standards process in the Special Access Undertaking (**SAU**). On top of this, most Australians have access to, and take-up services on, at least two different networks (i.e. there is redundancy of access technologies).

  o For many consumers, redundancy of access technologies coupled with existing WBA connect and assure timeframes ensures continuity of connectivity. For customers with heightened needs or in very remote areas, targeted consumer protections could be introduced to ensure their needs continue to be met.

- Together, these reforms would allow for the rationalisation of existing funding arrangements and replacement with a new mechanism that supports the sustainable operation of non-commercial networks, delivers targeted protections to ensure vulnerable Australians have access to a redundant/second service, and provides flexibility to fund alternative delivery models where required, including community connectivity for First Nations communities.

- In relation to funding, **nbn** notes that:

  o If the Universal Service Obligation (**USO**) and copper continuity are wound back, there are likely to be more customers on **nbn**'s fixed wireless and satellite networks. Funding may be required to meet increased demand and maintain service quality over time, and to meet potential costs of future delivery of satellite services.

  o Further, being an "infrastructure provider of last resort" requires a local workforce and dedicated customer support, and is often delivered at a commercial loss, necessitating appropriate funding.

- Overall, **nbn** believes these universal service and associated reforms will deliver better outcomes for consumers, at lower cost to government and industry, and with modern technical solutions that will ensure universal service policy remains fit for purpose into the future.

2. Introduction

The Government's consultation is timely, not only because of the emergence and growth of newer technologies which provide an opportunity to improve service delivery, but also because copper, other legacy technologies,[1] and **nbn**'s Sky Muster satellites will reach end-of-life in the coming years.[2] In this context, it is critical to consider how regional and remote Australians are using their telecommunications services, how they should best be served using modern technologies, and what universal service policy and regulation should require going forward, recognising that legacy networks and regulation cannot remain in place indefinitely.

Given that voice is now just another form of data, there should be a single service obligation to ensure a baseline level of modern and reliable broadband and voice is available to all Australian premises, framed in technology-neutral language as far as possible. The SIP regime already contains the framework for achieving this objective. It requires SIPs to connect premises and supply broadband services on reasonable request that deliver at least 25/5 Megabits per second (**Mbps**), and also requires fixed-line and fixed wireless networks to support the provision of voice services.[3]

Outside the fixed-line and fixed wireless footprints, LEO satellite networks are expected to deliver the capability to support metro-like baseline broadband and voice services. Many Australian providers (including **nbn**) are currently assessing the suitability of LEO satellite networks to complement their existing service offerings. While the ability of this technology to meet consumer and policy expectations still needs to be validated, LEO satellite technology represents an exciting development in relation to the provision of broadband and voice services, particularly in regional and remote areas.

Against this background, a modern universal service framework should operate to ensure baseline broadband and voice connectivity is available to all Australian premises. This framework should largely reflect the existing SIP

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[1] Including high-capacity radio concentrator (**HCRC**) and 3G wireless local loop (**NGWLL**).

[2] The asset life of **nbn**'s Sky Muster geostationary (**GEO**) satellites comes to an end in the early 2030's and replacement costs are high.

[3] Currently, the SIP legislation does not require satellite technology to support voice services (see section 360Q(1B) of the *Telecommunications Act 1997*).

regime, with some potential updates in relation to the satellite footprint, and subject to ensuring the network provider/s responsible for providing baseline connectivity are appropriately funded (noting that being a provider of last resort is often delivered at a commercial loss). Under this approach:

- For approximately 97-98% of the population covered by **nbn**'s fixed-line and fixed wireless networks, the baseline network would be **nbn** (or other non-**nbn** SIPs).

- For the remaining 2-3% of the population, a LEO satellite network could be used to provide baseline broadband and voice services in regional and remote Australia via a LEO-based SIP, provided government, industry and consumers are satisfied that appropriate technical, commercial, operational and security arrangements are in place to reliably deliver those services to Australian end-users.

A modern universal service framework needs to be supported by an equally modern consumer protection regime. When the existing protections were introduced, most Australian premises were served only by the Public Switched Telephone Network (**PSTN**), and there were concerns that a vertically-integrated provider would not have sufficient incentives to connect and repair services promptly. However, these protections are no longer fit for purpose. Consumers now have access to a range of technology options including the **nbn** network and other fixed, mobile, GEO and LEO satellite networks. **nbn**, as a wholesale-only provider and the default SIP, has strong incentives to continue to improve service assurance and customer experience. In addition, the take-up of redundant services on mobile/other networks is high, and reliance on fixed voice services has greatly reduced. For these reasons, legacy consumer protections linked to the provision of a Standard Telephone Service (**STS**) are no longer providing broad consumer protection and could be wound back. Instead, for most consumers, redundancy of access technologies coupled with existing WBA assurance mechanisms (and equivalent terms for non-**nbn** SIPs) will meet their connectivity needs. For customers with heightened needs (e.g. due to medical issues, network coverage or digital ability), a new, targeted scheme could be established to ensure connectivity is maintained and downtime minimised. Issues around electrical power resilience and service reliability would also need to be considered and resolved.

Finally, this consultation provides the opportunity to reset the framework by which community-based communications services are provided and funded. Payphones have long provided this service, particularly in the most remote First Nations communities around Australia. In more recent years, community connection has increasingly been provided by community Wi-Fi solutions (including those provided by **nbn**). As these services are generally non-commercial and are designed to deliver a social policy objective, this consultation provides the opportunity to ensure these critical services are placed on a sustainable, long-term footing.

Taken together, these reforms will allow for the phased retirement of legacy technology, policy and regulation, and replacement with a forward-looking technology-neutral platform to ensure baseline connectivity is available to all Australian premises, supported by updated consumer protections. This will improve the delivery of connectivity for regional and remote Australians by using modern technology to provide better broadband and voice services than those supplied over legacy copper and other networks. **nbn** is investing in its networks to take fibre deeper into communities, to extend coverage and increase speeds on **nbn** Fixed Wireless, and to free up capacity and increase performance on **nbn** Satellite. We are also assessing the viability of using a LEO satellite network to deliver services in our satellite footprint in future.

In turn, this will allow the streamlining and rationalisation of existing funding arrangements to optimise funding structures and ensure they deliver for end-users. This will require a detailed consideration of the most appropriate way to fund the network provider/s responsible for delivering baseline broadband and voice connectivity, including the non-commercial and social policy aspects of a revised universal service policy, as well as the specific needs of First Nations communities. Potential costs relating to future delivery of satellite services could also be funded through a reworked funding arrangement.

This submission focuses on the following topics:

- Section 3 discusses the existing universal service framework and how it has changed over time;

- Section 4 discusses how the use of telecommunications services has changed since the USO was introduced;

- Section 5 discusses the growth and evolution of telecommunications networks;

- Section 6 discusses the ongoing importance of availability and reliability of telecommunications services; and

- Section 7 discusses what a reformed universal service framework, and supporting consumer protections, may look like.

3. Existing universal service framework and changes over time

Universal access to baseline telecommunications services has been a long-standing policy objective in Australia. The USO, and related regulatory requirements including the Customer Service Guarantee (**CSG**) and Priority Assist (**PA**), are designed to give effect to this objective by ensuring consumers can access an STS (i.e. a landline voice service) wherever they live or work.[4]

These obligations apply chiefly to Telstra, who is the primary universal service provider. They were enacted at a time when the underlying national telecommunications infrastructure – the PSTN – was built to deliver landline voice services and operated by Telstra as a vertically-integrated provider.[5] The CSG and PA, which prescribe maximum timeframes for connection, repair and appointment-keeping of a STS, were put in place due to concerns about inadequate incentives to connect and repair services promptly, particularly in regional and remote areas, putting continuity of connectivity at risk.

The creation of the **nbn** network heralded a fundamental shift in how Australia's national telecommunications network was to be deployed. In contrast to the PSTN and ADSL, the **nbn** network is first and foremost a data network, with voice being one of many applications operating over it. The investment of over $50 billion in the **nbn** has enabled the delivery of high-speed broadband services right across Australia, the vast majority of which can support voice services that match or exceed the performance of traditional PSTN-based voice services. In addition, **nbn** is a wholesale-only operator and must provide services on a non-discriminatory basis with strict regulation by the Australian Competition and Consumer Commission (**ACCC**).

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[4] The USO also ensures access to payphones, but this submission focuses on the USO STS.

[5] The network then evolved to deliver broadband through Asymmetric Digital Subscriber Line (**ADSL**) technology.

The SIP regime, introduced in July 2020, recognises the importance of broadband infrastructure and services, and seeks to ensure their availability to all Australian premises. In effect, it provides a wholesale broadband guarantee to complement the existing voice service guarantee. It works by identifying a SIP for every premises across the country, and requiring SIPs to connect premises to a fixed-line, fixed wireless or satellite network, and to supply wholesale broadband services that enable speeds of at least 25/5 Mbps. In addition, SIPs who operate fixed-line and fixed wireless networks are required to support voice services, which recognises the shift towards broadband networks being used to provide voice, as opposed to legacy voice networks being used to provide broadband.[6]

nbn is the default SIP for Australia, which means **nbn** is required to connect premises on reasonable request by a Retail Service Provider (**RSP**) on behalf of an end-user, and to supply wholesale broadband services, except in limited geographic areas where there is another SIP (generally in new developments where a non-**nbn** carrier has contracted to install network infrastructure). **nbn**'s role as the default SIP is a significant responsibility reflecting the considerable investment made by the Australian public in building the **nbn** network.

In **nbn** fixed-line areas, Telstra complies with its universal service obligations by delivering voice services over the **nbn** network. Outside **nbn**'s fixed-line footprint, Telstra uses its own legacy networks to provide USO voice services, including its copper network (subject to a Copper Continuity Obligation (**CCO**) until 2032), as well as radio, mobile and satellite technologies. Recent changes to **nbn**'s WBA now allow RSPs to use **nbn**'s fixed wireless network as an input to downstream CSG services, meaning Telstra may incorporate **nbn** fixed wireless services into the range of technologies underpinning the delivery of USO voice services to premises.

4. Consumers have changed how they use telecommunications services

As mentioned above, the USO and associated regulatory requirements were introduced when Australians relied primarily on fixed-line voice services at work and at home. If we fast forward to 2024, the way voice services are delivered has changed dramatically. In addition to being provided over a data network, mobile voice has supplanted fixed voice as the default choice for large parts of the population. On top of this, other forms of communication reliant on broadband connectivity (e.g. messaging apps) are continuing to grow, consistent with ongoing increases in data demand and usage.

4.1 Reliance on fixed voice services has declined

Over the past 10 years, numerous reports have indicated an increasing move away from fixed telephony. For example:

* As far back as 2011, the number of Australians aged 14 years and over living in households without a fixed-line telephone service had reached 17% (or 2.7 million).[7]

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[6] While satellite networks can be used for voice calls, SIPs operating satellite networks are currently exempt from the obligation to support voice services, primarily due to latency issues associated with GEO satellites (see the Explanatory Memorandum to the *Telecommunications Legislation Amendment (Competition and Consumer) Act 2019*, page 157). 'Latency' refers to a delay in transmission, which is due to the distance that data needs to travel to and from the satellite.

[7] ACMA, 2010-11 Communications Report, page 17.

- In 2017, the Productivity Commission noted evidence that consumers' reliance on an STS as a preference to make or receive voice calls had continued to decline.

- In 2020, the Australian Communications and Media Authority (**ACMA**) reported that only 39% of people had a fixed telephone service at home. At that time, there were 6.17 million fixed-line voice services in operation (**SIOs**), either as part of a bundle (frequently with a broadband service) or as a standalone product.[8]

- In the same report, the ACMA indicated that *"while households with fixed-line voice services may have a service in operation, it may be unconnected to a handset, or never used."* [9] Of those households surveyed, 15% had a home phone which was not in use.[10]

- A 2022 ACMA survey found that just 1.6% of Australian households had only a landline phone, meaning the vast majority of households with a fixed voice service have another telecommunications service available to them as well.[11]

For at least some consumers, continued retention of a fixed voice service is likely to be due to legacy practice or for reasons controlled by their RSP. For example:

- There has been a long-held consumer practice to buy a bundled service plan that includes a fixed voice home phone service, most commonly with an internet or mobile service in the same package.[12]

- Larger providers such as Telstra have included a voice service as a default component of both legacy and some **nbn** plans, irrespective of whether the consumer wants or intends to use the voice service.[13]

4.2 Reliance on mobiles and other forms of communication has increased

Most Australians are now choosing to make voice calls on other networks, or to communicate by alternative means, often retaining a fixed voice service as a back-up:

- Mobile networks cover over 99% of the Australian population[14] and offer a genuine alternative for making or receiving voice calls at home or work. Mobile calls, texts, and messaging or calling apps are now the main

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[8] ACMA, *Communications and media in Australia Supply and use of services, 2019–20, April 2021*, page 15.

[9] ACMA, *Communications and media in Australia Supply and use of services, 2019–20, April 2021*, page 15.

[10] ACMA, *Telco consumer experience - Australian adults and households: Phone and internet services, October 2020*, page 52.

[11] ACMA, How Australians make voice calls at home.

[12] ACMA, *Communications Report 2009-10 series, Report 2 – Take-up and use of voice services by Australian consumers*, page 26.

[13] For example: https://www.telstra.com.au/help/critical-information-summaries/personal/home-internet/telstra-upfront-internet-plans/upfront-internet-plans

[14] https://www.infrastructure.gov.au/media-technology-communications/phone/mobile-services-coverage. **nbn** notes that, while over 99% of Australia's population has mobile network coverage, much of Australia's land mass does not: Understanding coverage maps - AMTA | The Voice of the Australian Mobile Telecommunications Industry

ways consumers communicate for personal use.[15] In recent years, approximately 78% of calls to Triple Zero have originated from a mobile.[16]

- Between 2016 and 2021, the total call time on fixed line phones dropped by over 50% to approximately 8.7 billion voice call minutes. In contrast, mobile phone calls make up an increasing majority of total voice call minutes each year, with mobile originating calls recently reaching up to 73 billion minutes.[17] Mobile phone SIOs increased from 11.1 million in 2001[18] to over 28 million SIOs in 2021-22.[19]

- An ACMA survey from 2022 found that nearly 63% of adult Australians rely solely on their mobile service to make voice calls at home. This has more than doubled since 2015, when the figure was 29%.[20]

- In the ACMA's 2023 survey, just 18% of Australians made a fixed phone call at home in the previous six months (to June 2023). In contrast, 97% made a mobile call and 84% used a calling or messaging app. Older Australians were the predominant users of fixed-line phone services, but even their usage fell from 39% in 2022 to 31% in 2023 for Australians aged 65-74, and from to 63% in 2022 to 58% in 2023 for Australians aged 75+. The vast majority of Australians in these age brackets also use other means of communicating, for example, a mobile phone.[21]

This data clearly demonstrates that the structural and technological changes which have occurred across the telecommunications industry over the past decade have seen corresponding changes in consumer behaviour. As the ACMA put it in their most recent "How we communicate" report:

> "Australians are more digitally connected than ever. Mobile phone calls have long been the most widely used way to communicate, but in 2023, mobile text messages came close. Messaging is also growing in popularity via apps such as Facebook Messenger and WhatsApp – we are now more likely to use an app for texting than calling, with nearly 4 in 5 of us doing it (more than in 2022)."[22]

The ongoing shifts in consumer behaviour are reflected in **nbn**'s network usage and demand patterns. Usage continues to grow, with the number of active premises rising to over 8.58 million customers. In addition to a larger volume of customers, the demand for data is growing and customers are ordering and receiving higher speeds over the **nbn** network, with end-user download speeds continuing to rise.[23] Recent research from Accenture indicates that average download speeds across Australia increased from 9 Mbps to 53 Mbps between

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[15] ACMA, Communications and media in Australia: How we communicate, services used.

[16] Department of Home Affairs, Advanced Mobile Location (triplezero.gov.au)

[17] Christopher Hughes, Australia: mobile and fixed line telephone usage 2021 | Statista

[18] ACMA, *Communications Report 2009-10 series, Report 2 – Take-up and use of voice services by Australian consumers*, page 3.

[19] ACCC, *Communications Market Report 2021-22*, page 12.

[20] ACMA, How Australians make voice calls at home.

[21] ACMA, Communications and media in Australia: How we communicate.

[22] ACMA, Communications and media in Australia: How we communicate, December 2023.

[23] NBN Co Half-Year Report 2024, page 9.

2012 and 2022, coinciding with the rollout of the **nbn** which has been the largest contributor to increasing download speeds.[24] In Australia, the vast majority of data traffic is carried on the **nbn**, and when mobile devices are used at work or at home, they are often connected to Wi-Fi and the **nbn**, rather than to a mobile network.

5.   Telecommunications networks are continuing to grow and evolve

In the coming years, **nbn** expects telecommunications network operators to continue to invest in new and emerging technologies to increase the coverage, capacity and capability of their networks and, as a result, to deliver enhanced offerings to their customers. At the same time, as the Department has noted in their consultation paper, questions have been raised about the ability of Telstra's legacy networks, including its copper network, to continue to provide the type and quality of services that consumers have come to expect.

This section of **nbn**'s submission briefly discusses the ongoing investments being made in **nbn**'s networks, as well as investments made by other network operators, all of which are relevant to determining what a modern universal service framework should look like.

In discussing the investments being made in new and emerging technologies, it is important to recognise that different technology types offer different features and benefits, and that future-focussed technologies will not necessarily replicate the operational attributes of legacy networks currently used to serve regional and remote Australia (e.g. the ability of a copper service to operate during a power outage). While that is so, it is clear that newer technologies will improve the way services are delivered to regional and remote Australians, by using modern and reliable networks in place of legacy networks reaching the end of their useful life.

5.1 Ongoing investment in nbn's networks

In December 2020, the Minister for Communications declared that **nbn** should be treated as built and fully operational. Since then, **nbn** has continued to invest in the evolution of its networks, to ensure it can keep ahead of data demand to help enable social equity, productivity and economic growth across the nation:

- **Investments in fixed-line networks: nbn** is taking fibre deeper into communities by enabling 3.5 million premises on Fibre to the Node (**FTTN**) and 1.5 million premises on Fibre to the Curb (**FTTC**) to upgrade to Fibre to the Premises (**FTTP**) on demand. By the end of 2025, 10 million premises (or up to 90% of premises in the fixed-line network) will be able to access the **nbn** Home Ultrafast wholesale speed tier, which is capable of delivering peak wholesale download speeds of 500 Mbps to close to 1 Gbps.[25]

- **Investments in fixed wireless and satellite:** Faster broadband for thousands of premises across regional Australia is being enabled by a $750 million investment to upgrade the **nbn** Fixed Wireless and Satellite

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[24] **nbn** media release, 'Accenture economic modelling reveals GDP benefits of faster, stronger NBN', 5 February 2024: https://www.nbnco.com.au/corporate-information/media-centre/media-statements/accenture-economic-modelling-reveals-gdp-benefits-of-faster-stronger-nbn.

[25] NBN Co Annual Report 2023, pages 7-8; NBN Co Half-Year Report 2024, pages 9, 11 and 12.

footprint. This includes a $480 million grant from the Government and an incremental $270 million contribution from **nbn**:

- o   **nbn** will use 4G technology and software enhancements, and introduce 5G mmWave technology, to help extend coverage, minimise congestion, and offer access to higher-speed tiers on **nbn** Fixed Wireless. This will allow approximately 120,000 former satellite-only customers to access the fixed wireless network, and will free up capacity and increase performance on the remaining satellite network.[26]

- o   The upgrades are intended to allow **nbn** to deliver typical wholesale busy period download speeds of at least 50 Mbps across the fixed wireless network, as well as introduce new **nbn** Fixed Wireless high-speed tiers with wholesale peak download speed ranges from 200-250 Mbps and up to 400 Mbps.[27]

- o   In the satellite footprint, **nbn** unveiled Sky Muster Plus Premium in 2023. These plans are designed for homes and small businesses, and include uncapped data usage for all internet activities and a choice of speeds.[28]

Investing in the coverage, capacity and capability of the **nbn** networks will continue to improve customer experience, with the Annual Service Improvement Plan (**ASIP**) setting out key initiatives which have the purpose of enhancing RSP and/or end-user experience.[29] In addition, as the default SIP and a wholesale-only provider, **nbn** has strong incentives to maintain and improve service levels through the WBA, including to connect customers and repair faults quickly and efficiently. For example, over the six months to 31 December 2023, **nbn** met agreed installation times 98% of the time, consistent with FY23 and up from 97% during HY22. Faults were resolved within agreed timeframes 92% of the time in the six months to 31 December 2023, in line with FY23 and up from 88% in HY22.[30]

5.2 Emergence and growth of LEO satellite networks

As noted above, SIP providers using satellite technologies are currently exempt from the obligation to support voice services. However, the emergence and growth of LEO satellite networks, facilitated by significant decreases in launch costs, is redefining the expectations of satellite technology capability.

LEO satellites have been shown to deliver higher broadband speeds and lower latency connectivity than GEO satellites. Due to their lower latency, they are marketed as being able to support metro-like voice services as well. For example, Starlink, Amazon and OneWeb have launched or are planning to launch LEO satellite constellations and provide services in Australia. Starlink stated in May 2023 that it already had around 120,000 Australian

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[26] NBN Co Annual Report 2023, page 8.

[27] NBN Co Half-Year Report 2024, page 12; **nbn** media release, 'Upgrades to **nbn** Fixed Wireless network deliver improvements for thousands as **nbn** proposes further enhancements to speeds', 1 November 2023.

[28] https://www.nbnco.com.au/learn/network-technology/sky-muster-explained/sky-muster-plus-explained.

[29] **nbn** FY24 Annual Service Improvement Plan.

[30] NBN Co Half-Year Report 2023, page 12, and NBN Co Half-Year Report 2024, page 17.

customers.[31] Its download speeds on standard plans range between 100-200 Mbps, with a latency of 25-50 milliseconds.[32] **nbn** expects these capabilities to improve over time, and supports the Department's initiative in conducting further trials of LEO-based services, including to understand their ability to support voice, and their reliability and operation during adverse weather conditions, in extreme climates, and during mains power outages.

The potential for LEO satellite networks to be used to deliver universal services to regional and remote Australians – and to provide a better experience than legacy technologies currently being used to serve these customers – is significant. That said, further work is needed to understand the performance and economics of LEO satellite networks, to determine whether and how they may be used to deliver baseline broadband and voice connectivity as part of a revised universal service framework. For example, further work is required to understand issues regarding the frequency and duration of outages, the impact of rain events, cost and affordability issues (for initial installation, equipment, and ongoing service charges), and customer support (for set-up, activation, and assurance purposes).

In addition, **nbn** acknowledges that LEO satellites will introduce new policy considerations that Australia has not had to contemplate previously. For example, the enormous capital cost of deploying a LEO satellite network is only likely to be economically feasible for a limited number of multinational corporations running a global business case. For this reason, the ultimate ownership of this type of infrastructure is unlikely to rest with the Australian people, and this will naturally lead to questions of data sovereignty, national security, and resilience, as well as further questions about cost and customer support (flagged above). While there are a range of options to solve for these issues, working through them will take time and careful consideration across industry sectors and government.

nbn is currently assessing the viability of using a LEO satellite network to deliver services to end-users in its own satellite footprint. In June 2023, **nbn** announced that it had released a closed request for information to LEO satellite providers to further understand their offerings. In making this announcement, **nbn** stated that:

> *The request for information is the first step in NBN Co looking ahead to how best to meet the evolving broadband needs of homes and businesses in the **nbn**® satellite footprint.*

> *The Company said the introduction of low earth orbit satellite technology over the last few years has been an exciting development. It is seeking to understand directly from the LEO operators what might be possible considering the scale of the **nbn** satellite footprint and user base and whether a number of unique **nbn** obligations can be met in order to supply services, including price certainty, network and data sovereignty and options for local support.*[33]

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[31] Lucas Baird, 'Musk's Starlink grows 20pc since Feb, charges past NBN satellite users', Sydney Morning Herald, 5 May 2023.

[32] https://www.finder.com.au/broadband-plans/starlink.

[33] **nbn** media release, 'NBN Co exploring connectivity solutions with low earth orbit satellite providers', 14 June 2023: https://www.nbnco.com.au/corporate-information/media-centre/media-statements/nbn-co-exploring-connectivity-solutions-with-low-earth-orbit-satellite-providers

nbn went on to say that: *"It is important that we properly evaluate the potential of emerging technologies, including low earth orbit satellites, to improve our network and fulfil our mission to lift the digital capability of Australia"* and that **nbn** believes *"low earth orbit satellite technology could be a part of our network in the future, so we are engaging with those that may be able to offer this as a service in order to find out whether it is feasible."*[34]

In addition to supporting fixed connections and services, LEO satellites may also support satellite direct-to-mobile (**D2M**) services in the future. While satellite phones already exist, they currently require dedicated handsets or other equipment (e.g. satellite sleeves). By contrast, satellite D2M services would allow communication directly with an end-user's mobile device, removing the need for a specialised satellite device and providing potential benefits to consumers in parts of Australia where there is no mobile coverage, albeit with the current limitation of requiring a direct line-of-sight to the sky.

5.3 Ongoing investment in mobile networks

Mobile network operators (**MNOs**) have continued to invest in their networks to improve coverage and capability. For example, the ACCC's Mobile Infrastructure Report from December 2021 found that *"Australia's three mobile network operators, Telstra, Singtel Optus and TPG Telecom made significant investments in mobile infrastructure between January 2018 and January 2021",* but noted that *"the focus has moved to 5G deployment predominantly in the major cities"*. Similarly, the ACCC's Mobile Infrastructure Report from November 2023 found that:[35]

- Telstra continues to have the most mobile sites, with significant dominance in regional and remote areas, but all three MNOs had added mobile sites since 2022. As at 31 January 2023, Telstra had 11,302 sites in operation, Optus had 8,821, and TPG had 5,769. Telstra had the greatest increase in mobile sites, up by 300 sites since 2022, followed by Optus with 189 more sites, and TPG with 41 more sites.

- The transition away from 3G networks continued, largely taking place in major cities. The number of 3G sites is expected to decrease significantly in the next 12 to 18 months, noting all three MNOs have announced plans to shut down their 3G networks.

- At the same time, the 5G rollout is gathering pace. While most 5G sites have been rolled out in major cities, all three MNOs now have a 5G presence in each of the Australian Bureau of Statistics Remoteness Areas (except TPG in Very Remote Australia).[36]

Mobile network investment has been supported by the Australian Government through initiatives such as the Mobile Black Spots Program. As **nbn** understands it, over 99.5% of the population is now covered by at least one mobile network, and over 98% of the population is covered by at least two mobile networks. **nbn** expects mobile

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[34] **nbn** media release, 'NBN Co exploring connectivity solutions with low earth orbit satellite providers', 14 June 2023: https://www.nbnco.com.au/corporate-information/media-centre/media-statements/nbn-co-exploring-connectivity-solutions-with-low-earth-orbit-satellite-providers

[35] ACCC, *Mobile Infrastructure Report 2023*, November 2023, pages 1 and 2.

[36] Remoteness Structure | Australian Bureau of Statistics (abs.gov.au).

network investment to continue in the coming years, with a focus on boosting 5G services even further (although we note that, due to Australia's large geographical area and population distribution, much of Australia's land mass will continue without mobile coverage).

6. Availability and reliability remain key concerns for Australians

While the telecommunications landscape has changed significantly in the past decade, in relation to both technological advancements and consumer behaviour, key issues regarding availability and reliability of telecommunications services remain just as important for consumers now as they were 10 years ago.

In its 2021 report, the Regional Telecommunications Independent Review Committee (**RTIRC**) made the following observations and findings about reliability, resilience and redundancy:[37]

- Access to reliable telecommunications services has never been more important for regional, rural and remote Australians. In times of disaster, they rely on mobile, landline and broadband networks for real-time information, access to emergency services, contact with loved ones, and resources to support post-disaster recovery.

- There is continued concern around ongoing service delivery under the USO. Telstra is the primary USO provider and the Telecommunications Universal Service Obligation Performance Agreement (**TUSOPA**) contains a CCO. But copper landlines in regional, rural and remote areas are deteriorating and their reliability has been impacted. There is strong and pressing need for USO reform to address the substantial ongoing stress on ageing infrastructure.

- While a 'technology agnostic' approach to USO service delivery is likely to be appropriate, the reformed arrangements must ensure alternative technologies exceed existing reliability standards. This should require the inclusion of backup power and strict minimum availability and voice quality standards.

- There is also a need to improve the resilience of telecommunications infrastructure in areas where there are frequent power outages, particularly those at risk of natural disasters. Mobile base stations, telephone exchanges and other infrastructure are vulnerable to power interruptions, and often insufficiently provisioned with auxiliary back-up power.

nbn expects similar issues may be raised as part of the current consultation and RTIRC process, with topics such as the importance of maintaining connectivity, the suitability of new technologies for Australian conditions, the need for consistent power, and the requirement for appropriate affordability measures, likely to be top-of-mind for people in regional and remote Australia.

nbn acknowledges – and agrees – that these are important issues to consider and address in developing a new universal service framework. **nbn**'s view is that the significant technology changes which have already taken place

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[37] Regional Telecommunications Review, *2021 Regional Telecommunications Review: A step change in demand*, pages 6 and 7.

– and which will accelerate in the coming years – are delivering material benefits to Australians through improved connectivity options and, as a result, will improve reliability, resilience and redundancy as well.

nbn understands that some consumers in regional and remote Australia may be concerned about a shift away from the legacy copper network, particularly given that it is a terrestrial network (as opposed to, say, LEO satellite networks) and that traditional landline telephones typically continue to work during a power outage (unless the outage also affects the exchange, and provided the end-user's handset does not require mains power itself).

However, these benefits are being eroded by the ageing nature of the copper network, which itself drives more frequent drop-outs and performance faults. Copper (and supporting network equipment) is reaching the end of its useful life and is being replaced by newer, more future-focussed technologies which bring their own advantages (which copper may not have), noting that each technology type will have benefits and downsides relative to others. For example, because they are not terrestrial networks, LEO satellite networks will not be susceptible to damage from natural disasters in the same way as terrestrial networks.

In addition, while newer technologies may require mains power to operate in the home, the widespread take-up of mobile devices, coupled with availability of battery back-up / Uninterruptible Power Supply (**UPS**) devices, can help end-users ensure continuity of connectivity during a power outage. The need for and provision of battery back-up / UPS devices should be considered as part of this USO reform process, including understanding existing take-up of UPS devices and the circumstances in which assistance to procure these devices may need to be provided to certain customer cohorts.

Importantly, the Department's consultation paper expressly states that evidence is required about the ability of alternative networks to deliver baseline voice and broadband service to the required level, and that trials will be conducted to help gather this evidence (on top of those already conducted during 2021-22 through the Alternative Voice Services Trials (**AVST**), in which **nbn** participated).

In particular, the discussion paper summarises the AVST results as follows:

The trial services typically involved applications of existing technologies like fixed wireless, 4G and satellite, but often provided new functionality, such as the ability to make and receive calls using the customer's mobile handset in the home, even if mobile network coverage was poor or absent. These trials generally demonstrated that good quality voice services could be delivered over alternative technologies, particularly fixed wireless. However, they also identified a range of issues that still needed to be worked through, including issues with outages and customer support. A key limitation was that LEOSats were not able to be widely tested as they were not commercially available in Australia at the start of the trials.

In relation to future trials, the discussion paper goes on to say that:

The Government considers it is important to establish a clear and transparent body of evidence on whether alternative and emerging networks are capable of delivering the required levels of service. Accordingly, the Government intends to undertake trials to test the suitability of emerging technologies. This will gather quantitative data on a range of matters which may impact the availability, accessibility, quality and reliability of alternative platforms, including how technologies are impacted by geographical location, weather, climate, topography, equipment types and power requirements.

In relation to its own networks, **nbn** notes that:

- It has been making significant investments in back-up capability for its fixed wireless towers, aimed at keeping the towers online during power outages. For example, in July 2023, **nbn** announced it had completed a $4.4 million Hybrid Power Cube Project, funded under the Black Summer Bushfire Recovery Grants Program, to make fixed wireless tower infrastructure more resilient. Hybrid Power Cubes combine solar panels, batteries, and compact diesel generators, to help maintain power and internet connectivity during times of natural or other disasters.[38]

- More generally, **nbn** is always working to improve the **nbn** network's resiliency and the way it prepares for, responds to, and recovers from emergency events. **nbn** has continued to invest in Temporary Network Infrastructure to help restore the **nbn** network quickly and safely when impacted. This equipment keeps the power running in the event of an outage or site isolation, or can be rapidly deployed to support communities during the relief and recovery phases of an emergency – either to restore the **nbn** network or provide temporary internet connectivity. In the event of a disaster, **nbn** will prioritise restoring services to impacted communities, including special consideration of essential services, community infrastructure and business services in any restoration planning.[39]

- In the past few years, as part of the Federal Government's Strengthening Telecommunications Against Natural Disasters (**STAND**) program, **nbn** has installed more than 1000 **nbn** Disaster Satellite Services across Australia in jurisdictionally nominated emergency management sites and evacuation centres.[40]

As part of the Department's consultation process, consideration should be given to the capabilities of the network provider responsible for baseline connectivity, and the potential for further Government-funded investments in temporary network infrastructure to support the objective of continuity of this baseline connectivity.

7. Fundamental technology shifts require a fundamental review of supporting policy

As can be seen from the sections above, since the USO was enacted, there has been a fundamental shift in the way telecommunications networks operate, and in the way they are used:

- Telecommunications networks are now high-speed data networks which are used to deliver voice (and many other) services. The vast majority of Australian consumers are now covered by and have access to at least two different telecommunications networks, including **nbn** and other SIP networks, mobile networks, and

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[38] **nbn** media release, 'Fixed Wireless tower network power resiliency project now complete', 14 July 2023: Fixed Wireless tower network power resiliency project now complete | nbn (nbnco.com.au).

[39] **nbn**, 'How to prepare: **nbn** and emergency events', 7 September 2023: https://www.nbnco.com.au/corporate-information/about-nbn-co/newsroom/articles/community/how-to-prepare-nbn-and-emergency-events#:~:text=To%20help%20keep%20customers%20connected,the%20field%20following%20a%20bushfire.

[40] **nbn**, 'How to prepare: **nbn** and emergency events', 7 September 2023: https://www.nbnco.com.au/corporate-information/about-nbn-co/newsroom/articles/community/how-to-prepare-nbn-and-emergency-events#:~:text=To%20help%20keep%20customers%20connected,the%20field%20following%20a%20bushfire.

LEO satellite networks. They are less reliant on fixed voice services, are more likely to make voice calls using a mobile device, and are also communicating via other means, including calling and messaging apps.

- By contrast, the number of services delivered over Telstra's legacy networks is declining, and its copper infrastructure continues to age. Telstra is required to maintain its copper network outside **nbn**'s fixed-line footprint in accordance with the CCO until 2032 and, where copper is not available, Telstra uses a range of other legacy networks to provide USO voice services. But these networks will reach the end of their useful life in the coming years, necessitating a shift in how regional and remote Australians are served, and in the policy and regulatory regime underpinning universal service.

Against this backdrop, the case for reforming the USO is clear. Newer and emerging technologies can deliver enhanced connectivity to Australians, particularly those in regional and remote parts of the country currently served by ageing legacy networks. Further, as voice is now just another form of data, there can be a single service obligation which guarantees baseline broadband and voice over modern and reliable networks, and removes overlapping and duplicative regulatory obligations tied to the ongoing operation of legacy networks and outdated service level requirements.

nbn's suggested approach for a new universal service framework is discussed in more detail below. **nbn** notes that, in its view, a revised universal service framework should focus on ensuring access to baseline connectivity, rather than addressing issues of affordability which are more appropriately dealt with via other mechanisms. However, we do consider that, in revising the associated consumer protections, income level is relevant to considering which customers may need targeted support to ensure they have ready access to a second/redundant service.

7.1 A new universal service framework

At a high level, **nbn** considers that the following principles should underpin a new universal service framework:

- The framework should operate to ensure that baseline broadband and voice connectivity is available to all Australian premises.

- This should largely reflect the existing SIP regime, which already goes a long way towards guaranteeing baseline broadband and voice connectivity over modern and reliable networks. It does this by ensuring all Australian premises have access to fixed broadband, and by requiring SIPs to support voice services on fixed-line and fixed wireless networks (but not currently satellite networks due to latency issues with GEO satellites).[41]

- Under this approach:
  - For the ~97-98% of the population covered by **nbn**'s fixed-line and fixed wireless networks, the baseline network would be **nbn** (or non-**nbn** SIPs).

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[41] As mentioned above, 'latency' refers to a delay in transmission which is due to the distance data needs to travel to the satellite and back. GEO satellites are typically located around 36,000 km from Earth, compared to LEO satellites which are located around 500-2000 km away.

- o For the remaining 2-3% of the population, LEO satellite networks are expected to deliver a metro-like baseline service, with many Australian providers (including **nbn**) currently assessing the suitability of LEO satellite networks to complement or form part of their service offerings. Provided that acceptable technical, commercial, operational and security arrangements are able to be developed and put in place, a LEO satellite network could be used to provide baseline broadband and voice to the 2-3% of the population outside fixed-line and fixed wireless footprints.[42]

- o It is unlikely there will be an Australian-owned LEO satellite network, which means the nature and application of a revised regulatory framework in the remaining 2-3% footprint may need to change if it is decided that a LEO satellite network will be used to provide baseline broadband and voice in this footprint, e.g. some amendments may need to be made to the SIP regime so that it can apply appropriately to a SIP using a third party LEO satellite network or their own.

- The network provider/s responsible for baseline connectivity will need to be appropriately funded, noting that being an infrastructure provider of last resort requires a local workforce and dedicated customer support, and is often delivered at a commercial loss.

- The requirement to provide baseline connectivity should be technology-neutral as far as possible, to maximise flexibility and avoid entrenching any particular technology-type.

This approach will provide a forward-looking platform for ensuring baseline connectivity is available to all Australian premises, including improved delivery of this connectivity for regional and rural Australians, and allow for the phased retirement of legacy policy and regulation, including the USO and CCO.

7.2 Updated consumer safeguards

A modern universal service framework of this kind will need to be supported by an equally modern consumer protection regime – one that recognises the availability and use of multiple technology options (fixed-line, fixed wireless, GEO and LEO satellites, and mobile networks), and appropriately targets consumer protections to those end-users who need it.

The consumer safeguards which support the USO (i.e. CSG and PA) were established when a PSTN-based STS was seen as the baseline ubiquitous carriage service to which all Australians should have access, and to ensure that Telstra as a vertically-integrated provider would connect and repair these services in a timely way.

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[42] End-users in this footprint may have access to one or more other networks, including 4G, although services may have limited data capacity. For example, Telstra's 4G fixed wireless service offers typical speeds of 12-23 Mbps download, and 1-5 Mbps upload between 7-11pm: https://www.telstra.com.au/internet/nbn/4gfw-speeds-explained

The changes in telecommunications technology and consumer usage patterns mean that these existing consumer protections are no longer fit for purpose. In particular, **nbn** notes that:

- Reliance on fixed voice services continues to decline, most RSPs ask their customers to waive their CSG rights,[43] and Telstra can offer interim and alternative services in place of specific performance standards.

- Australia's national network provider is no longer a vertically-integrated operator of a PSTN network. Instead, **nbn** is a wholesale-only operator of a broadband network, with voice being one of many applications operating over it. **nbn** has strong incentives to continue to improve service assurance and customer experience, which it does in a range of ways including undertaking the initiatives detailed in its ASIP, and through service level commitments in the WBA (which are subject to the Benchmark Service Standards process in the SAU). On the latter point, **nbn** notes that while there is some alignment between wholesale service levels under the WBA and legacy retail protections under CSG and PA, and some support under the WBA for retail connection and repair timeframes on the **nbn** fixed-line network (e.g. through Accelerated Connections), **nbn**'s systems, processes and workforce arrangements have not otherwise been designed to meet the CSG Standard or PA requirements.

- In addition, most Australians are now covered by at least two different telecommunications networks through which they may access broadband and voice services (i.e. there is a redundancy of access technologies and therefore network competition). In **nbn**'s fixed-line and fixed wireless footprints (and those within non-**nbn** SIP service areas), most consumers are covered by at least two terrestrial networks (i.e. the **nbn** / SIP network and one or more mobile networks). Beyond these footprints, consumers have access to **nbn** Sky Muster satellites, mobile services (where coverage is available), and LEO satellite services.

With all this in mind, if the universal service framework is reformed as suggested above, legacy consumer protections linked to the provision of an STS would need to be wound back. While delivering high quality services is important, using outdated regulatory regimes will not provide better services for consumers and it will impose higher costs on industry, which ultimately results in higher prices for consumers.

For most consumers, redundancy of access technologies and services, coupled with existing WBA assurance mechanisms (and equivalent terms offered by non-**nbn** SIPs), are likely to be sufficient to meet their connectivity needs. For customers with a heightened need, new and much more targeted consumer protections could be introduced to ensure their connectivity is maintained through access to a redundant service.[44]

More specifically, this approach could be underpinned by the following principles:

- **SIPs are required to connect, supply and repair in defined timeframes**: SIPs are required to publish their connection and supply terms and conditions, including maximum timeframes for connection, supply and

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[43] Discussed in detail in **nbn**'s submission to the Department's Thematic Review of the CSG, dated March 2023, available at: https://www.infrastructure.gov.au/sites/default/files/documents/csg-thematic-review--nbn-co-submission.pdf.

[44] As the Department's discussion paper explains, the existing CSG instrument was recently rolled over for 3 years, with the expectation that fundamental change to USO policy would necessitate further review of consumer protections and the CSG. **nbn** suggests universal service policy and supporting consumer protections should really be considered together.

repair. As discussed in detail above, **nbn** has strong incentives to continue to improve service assurance and customer experience, including by continuing to invest in its networks and through service level commitments in the WBA. In addition, the Minister is empowered to set maximum timeframes by making SIP standards, rules and benchmarks if necessary. These aspects of the SIP regime ensure that fixed services are connected, supplied and repaired within defined timeframes.

- **Most consumers benefit from redundancy of access technologies and services**: Most consumers 'self-manage' their connectivity by taking up services on different telecommunications networks (e.g. fixed, mobile, satellite). Where this occurs, it reduces the risk that these consumers will be left without a working service in the event of a service delay or disruption. Taken together, redundancy of access technologies and services, coupled with existing WBA connection and assurance timeframes (and equivalent terms for non-**nbn** SIPs), will help maximise connectivity and minimise downtime for most consumers.

  nbn acknowledges, however, that in some remote locations, satellite may be the only access technology available beyond existing legacy networks (albeit different satellite networks operated by different providers). **nbn** also acknowledges that some consumers may not be in a position to readily take-up a second or redundant service, or may have a particular need for such a service. Australians in these circumstances may require additional protections, discussed further in the following point.

- **Additional protections for customers who need them, to ensure connectivity is maintained**: Some consumers may need additional protections to ensure their connectivity is maintained if they experience a service delay or disruption. In light of the market shifts discussed in detail above, **nbn** believes these protections should focus on people with a heightened need for connectivity who do not have ready access to or the ability to acquire a second service (on top of a fixed service) (e.g. an existing mobile, satellite, or hybrid modem). **nbn** expects these types of protections would be needed where there are barriers to accessing an adequate redundant service (e.g. customers outside mobile coverage, customers with poor mobile reception in their home, customers in satellite-only areas, low-income customers) especially if they have a life-threatening medical condition and may be at risk without access to a working telecommunications service.

  The Department should carefully examine which customer cohorts are already protected by the availability of existing services, and which cohorts may need additional targeted regulation and policy to ensure they continue to have adequate availability of services that provide sufficient support for their more complex or challenging communication needs. This should also include consideration of the circumstances in which customer access to battery back-up / UPS devices may need to be supported, and potentially mobile signal boosters to improve access to mobile services in premises where reception is poor. Further, given the differing levels of digital literacy across the community, awareness raising / educational campaigns may need to accompany the shift to a new universal services and consumer protection framework.

  The Department will also need to explore the range of options available for implementing this kind of consumer protection regime, including whether a single or multiple providers should be responsible for doing so, or whether a direct end-user subsidy may be a suitable approach in some circumstances.

7.3 First Nations communities

This consultation provides an opportunity to reset the framework by which community-based communications services are provided and funded.

Payphones have long provided this service, particularly in remote First Nations communities around Australia. However, changing needs and expectations mean that there is need for a bespoke service delivery model to provide effective access to telecommunications services in First Nations communities into the future.

As at December 2023, **nbn** had 109 community Wi-Fi points installed within 99 First Nations communities around Australia, enabling access to essential services such as telehealth, MyGov, online education and mentoring services. The majority of these connections are single-point Wi-Fi systems, but **nbn** has also deployed four pilot mesh public Wi-Fi systems, enabling Wi-Fi coverage to extend throughout public spaces in the community.[45]

The First Nations Digital Inclusion Advisory Group's (**FNDIAG's**) Initial Report revealed that free public Wi-Fi is greatly valued by communities. **nbn** is continuing to work with FNDIAG's panel and Government agencies on scaling its Community Wi-Fi Program to around a further 20 communities.[46]

As community-based telecommunications services are generally non-commercial and are designed to deliver a social policy objective, this consultation provides the opportunity to simplify and streamline the funding and selection processes to ensure these critical services are placed on a sustainable, long-term footing.

7.4 Opportunity to reform and optimise funding arrangements

Reforming the universal service framework and associated consumer protections in the way discussed above will allow the streamlining and rationalisation of existing funding arrangements to optimise funding structures and ensure they deliver for end-users.

Determining what those optimised funding structures should look like will require a detailed consideration of the most appropriate way to fund the network provider/s responsible for delivering baseline broadband and voice connectivity, and the activities for which funding is required. This includes the sustainable operation of non-commercial networks, the delivery of targeted protections to ensure vulnerable Australians have access to redundant services, and flexibility to fund alternative delivery models where required, including community connectivity for First Nations communities.

A reworked funding arrangement could also be used to support other important connectivity initiatives, potentially including expansion of terrestrial access technologies into regional and remote areas where it makes economic sense to do so.

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[45] NBN Co Half-Year Report 2024, page 22.

[46] Minister for Communications (Hon Michelle Rowland MP), Media release, 'Next steps on closing the gap: delivering remote jobs', 13 February 2024: https://minister.infrastructure.gov.au/rowland/media-release/next-steps-closing-gap-delivering-remote-jobs.

In relation to funding, **nbn** also notes that:

- If the USO and CCO are wound back, there are likely to be more customers on **nbn**'s fixed wireless and satellite networks, and funding may be required to meet increased demand and maintain service quality. In addition, if revised universal service policy involves a LEO-based SIP provider in the satellite footprint, there are likely to be new costs or subsidies required to facilitate industry and end-user migration and potentially to ensure price parity with baseline terrestrial services. These issues should be considered in the upcoming universal service funding consultation.

- Further, being an "infrastructure provider of last resort" requires a local workforce and dedicated customer support, and is often delivered at a commercial loss, necessitating appropriate funding as well.

nbn expects these issues will be canvassed in more detail as part of the Government's upcoming consultation on the best mechanism for delivering sustainable, long-term funding of universal services, particularly in regional and remote Australia. **nbn** looks forward to contributing to this conversation over coming months.

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