



# BIRRR RECOMMENDATIONS

1. A Telecommunications Universal Service Obligation (TUSO) must be technology neutral and provide access to affordable, reliable & equitable voice and broadband data services for all Australians, regardless of their location.
2. The National Broadband Network (nbn<sup>TM</sup>) SHOULD NOT be the Universal Service Infrastructure Provider (UIP), until consumers who are unable to access nbn<sup>TM</sup> fixed line can be guaranteed a minimum standard baseline voice and broadband service. The quality and reliability of nbn<sup>TM</sup> Sky Muster and Fixed Wireless services are currently below the baseline that the broader community would regard as acceptable for a universal service. The nbn<sup>TM</sup> network design is a direct consequence of the Government mandate for a quick and cheap Australia wide 25/5Mbps internet service. It is totally inappropriate for secure high availability, high quality voice traffic.
3. That the telephone Customer Service Guarantee (CSG) is both retained and expanded. Customers without a reliable mobile service require a dependable CSG alternative to an nbn<sup>TM</sup> network provided Voice Over Internet Protocol (VoIP) telephone service. An alternative high availability voice service is essential in emergencies. This alternative service is fundamental to report and troubleshoot nbn<sup>TM</sup> services. As a strengthening of the existing telephone CSG, it is strongly recommended that a Managed VoIP service standard is established to deliver key service availability and service features for Australian VoIP services.
4. If Sky Muster and fixed wireless customers must use VoIP, as their primary voice service, retail providers must ensure that data packages, reliability and voice quality are sufficient to provide a comparable level of service at a comparable price to that which is available using standard telephones. The noteworthy limitations on the suitability of nbn<sup>TM</sup> Sky Muster VoIP for voice calls must be considered, to ensure businesses, students and consumers have access to reliable and guaranteed voice services that meet their needs and are not inferior to current TUSO requirements.
5. The Productivity Commission (PC) must not consider rural, regional and remote (RRR) mobile connectivity as a replacement for a Universal Service Obligation (USO) landline, until this connectivity at least meets the same service guarantees as existing arrangements.

## KEY POINTS

- **VOICE:** The USO should continue to ensure that **ALL** Australian consumers and businesses have baseline voice services that are at least equivalent to the standard offered under the existing TUSO. Standard telephone services must be maintained until such a time that baseline service needs are exceeded using alternate Broadband technology. All existing landline options must be covered under the USO (even those that are currently not included) – Copper and Telstra Customer Radio Network (TCRN) systems. There should be no degradation in the current voice service that users receive. The USO should be technology neutral and updatable to ensure ongoing needs are met.
- **BROADBAND:** The USO policy objective should be re-framed to include a baseline Broadband service to all premises. Wherever Australians live and work they should have access to equitable, guaranteed broadband data services, which exceed a minimum standard in terms of accessibility, affordability, upload/download speed, reliability, repair times, data allowances and maximum access network latency. These standards must allow and support all essential business applications and not restrict the use of remote desktop or cloud-based services. Most Government services are now solely or primarily available online. The PC must recommend the un-metering of key Government websites, in particular those providing essential services. The minimum standards must be regularly reviewed to ensure all Australians keep pace with the growth in technology.
- **CAPACITY BUILDING:** There needs to be serious investment in fully resourced capacity building programs that build digital ability, innovation and effective problem solving for RRR consumers. This will ensure integrated communities, a greater social unity, business and productivity growth and efficiency. Currently there is a great deal of confusion among RRR consumers about technologies and a lack of support and information regarding telecommunications. nbn<sup>TM</sup> and service providers are NOT filling this gap and the digital divide is growing wider.
- **CUSTOMER SERVICE GUARANTEES:** It is fundamental that USO safeguards are reformed so that they are relevant to consumers now and into the future. It is imperative that there are clear standards, targets and accountability in regards to connection and repair times, performance levels, reliability and safety nets for vulnerable consumers for both voice and broadband.
- **MOBILE CONNECTIVITY:** The expansion of mobile coverage is critical in rural and remote areas and requires continued, long term public funding for further coverage. All new infrastructure projects should be required to partner with telecommunications infrastructure providers to share infrastructure and improve mobile technology for communities. If the mobile network is to be used to replace existing USO requirements it needs to be subjected to baseline quality voice service guarantees that ensure accessibility, affordability, upload/download speeds, reliability, repair times and data allowances.

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## 1. BACKGROUND & OVERVIEW

The **Better Internet for Rural, Regional & Remote Australia (BIRRR)** group was founded in 2014 due to a lack of information, advocacy and support for bush broadband consumers. In particular, those requiring equitable telecommunications for their businesses and education of their children. There are now over 8,800 active, engaged BIRRR members from every state and territory of Australia (see **Figure 1** for engagement statistics). RRR consumers are extremely reliant on effective communications, due to the nature of their geography, and this also heightens the need for effective representation. The BIRRR team has undertaken extensive large-scale research on regional telecommunication needs. Previously there have been few studies and limited research into this specific consumer group.

### Better Internet For Rural, Regional And Remote Australia (BIRRR)

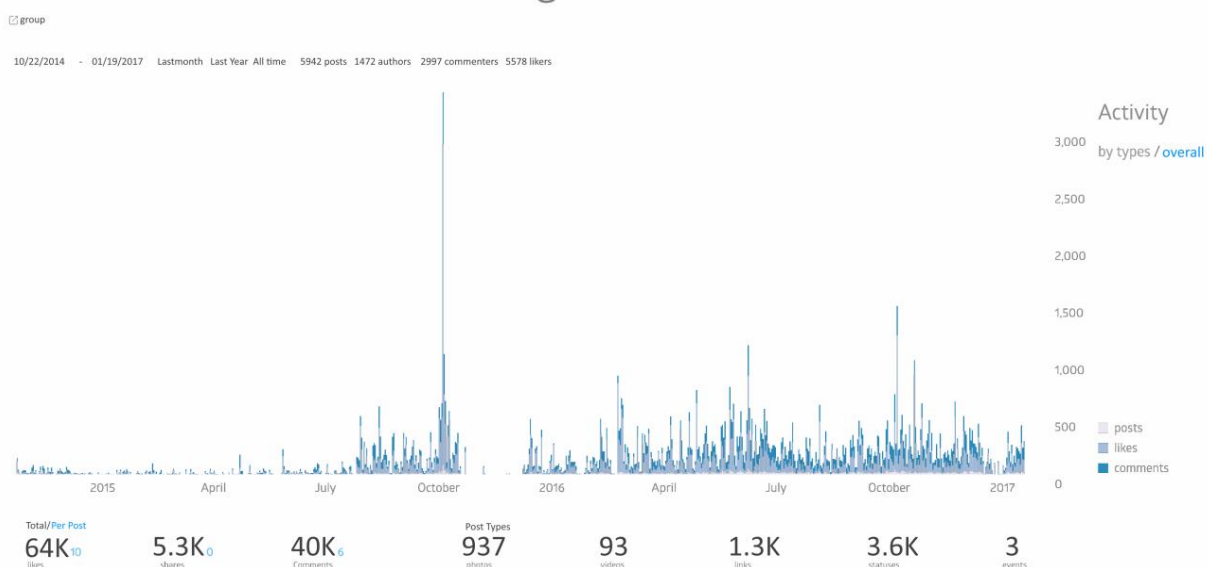


Figure 1 BIRRR group Facebook engagement statistics for 2014-2017

BIRRR appreciates the opportunity to respond to the *Productivity Commission's (PC) Draft Report on the Telecommunications Universal Service Obligation (December 2016)*. Equity of service is essential for RRR consumers, irrespective of where they choose to work and live. The contribution to the Australian economy made by RRR residents and businesses far outweighs the current infrastructure expenditure on telecommunications for these regions. To highlight, each person in the Quilpie Shire Queensland, contributes \$250,000 to the economy, compared to Brisbane's \$70,000. (Central Western Queensland Remote Area Planning and Development Board, RAPAD, 2016). To ensure RRR productivity and growth and to keep people living in RRR areas, voice and broadband services must be **accessible, affordable, reliable and equitable**. Essential services in RRR areas are already lacking, mental and physical health, education, business productivity, tourism, economic growth and innovation would all benefit from improved telecommunications.



BIRRR believes that a USO that is technology neutral and provides access to both voice and data is imperative for the future of rural communities. A broadband USO must address the ongoing #datadrought faced by RRR Australians. We urge the Productivity Commission (PC) to ensure that a future USO guarantees service and minimum standards for both voice and broadband. BIRRR advocates that a reformed USO should include baseline standards (see **Appendix 1**) for affordability, reliability, accessibility and Quality of Service (QoS). **As such the current nbn™ Sky Muster satellite and fixed wireless services should be ruled as inadequate replacements for existing landline services.**

The USO has always been a priority for people in rural and remote Australia, where the landline is often the only form of telecommunications. The USO ensures that it is an accessible, affordable and reliable service. With the current nbn™ Multi Technology Mix (MTM) being rolled out, the USO must ensure any premises mapped for nbn™ Sky Muster or nbn™ Fixed Wireless services can access **an equivalent or superior standard to that which is currently available under the TUSO**. This includes many small townships and communities and metropolitan premises that are currently receiving Asymmetric Digital Subscriber Lines (ADSL). The BIRRR team is concerned that many end users who are mapped for nbn™ Sky Muster are choosing not to get connected because it does not meet their data, reliability and low latency needs now, nor will it meet needs going into the future. Instead they are staying on existing ADSL infrastructure or using mobile broadband until such a time that their voice and broadband needs can be met. If existing landlines are removed these end users will not have access to a fixed voice service.

The BIRRR team also caution using mobile coverage maps as an indication of reliable mobile coverage and as such a replacement for landlines. Mobile coverage is patchy in rural and regional areas (non-existent in many remote areas) and would not meet minimum standards in regards to reliability, affordability, accessibility, quality of service (QoS) and repair times. Some rural properties may get coverage outside their homes, but without significant investment (through the purchase of boosters and antennas) by the end user there is insufficient coverage to make or receive a call inside the house.

The use of nbn™ as a Universal Infrastructure Provider (UIP) would cause a massive downgrade of internet connectivity for many RRR Australians. Although mandated to deliver a minimum speed requirement to every Australian, there is no guarantee, accountability or responsibility given by nbn™ to deliver reliable, affordable and equitable services. The nbn™ roll out was not designed or funded or expected to deliver voice services and as such nbn™ technology is unsuitable to meet the demands and QoS issues that would be placed upon it. The Government delivered nbn™ a modified **Statement of Expectations (Appendix L)** to guide the steps in delivering nbn™ on 24<sup>th</sup> August 2016.

“This Statement of Expectations is issued by Shareholder Ministers and guides NBN Co Ltd to ensure its **strategic direction aligns with the Government’s objectives** for delivery of the network. It replaces previous statements provided to the company and will be updated as required to reflect future decisions by the Government.”

“The Government is committed to completing the network and ensuring that all Australians have access to **very fast broadband** as soon as possible, at affordable



prices, and at least cost to taxpayers. The Government expects the network will **provide peak wholesale download data rates** (and proportionate upload rates) of at least 25 megabits per second to all premises, and at least 50 megabits per second to 90 per cent of fixed line premises as soon as possible.”

*Department of Communications & The Arts, 2016*

As a consequence BIRRR cannot support the USO draft recommendation:

*“the Government’s stated intention for nbn<sup>TM</sup> to be the statutory infrastructure provider of last resort should be legislated as soon as possible to provide the community with confidence about the ongoing delivery of services, especially if nbn<sup>TM</sup> is privatised in the future.” (P.11 USO Draft Report)*

If a USO system is removed from the Australian telecommunications platform it will have further detrimental effects on the economic, social and health of regional Australia.

*“...having adequate access to reliable, high speed and widespread mobile phone and internet coverage is critical to the future of many rural and regional businesses, from retail shops to farmers and manufacturing industries. Good telecommunications access can support the development not only of traditional businesses, but of e-commerce businesses located in rural and regional areas.”*

*Rao et al. 2011 Regional Wellbeing Survey, 2015.*

The BIRRR team is on the ground in RRR areas every day, troubleshooting thousands of cases that providers, nbn<sup>TM</sup> and the government continually disregard. The BIRRR team is made up of 5 volunteers who are all rural women that have dedicated countless volunteer hours to ensure RRR telecommunications issues are resolved. The very reason for the existence of the BIRRR group is the reluctance of nbn<sup>TM</sup> and providers to offer reliable services with efficient customer service and transparent information to RRR consumers. With over 119,000 website hits and hundreds of requests for help weekly, BIRRR highlights the need for RRR consumers to be able to access user friendly telecommunications services that meet their specific needs. Other essential service providers in RRR areas manage to do their own troubleshooting of issues, they don’t expect a volunteer group to do it for them. **The telecommunications industry should be appalled in their apathetic attitude to RRR telecommunications consumers.**

Every Australian, irrespective of where they live or work, should be confident they can access quality, reliable, accessible & affordable voice and broadband services with customer support guarantees. Numerous enquiries, reference groups and research have already been undertaken. BIRRR urges the PC to acknowledge that now it is time to be proactive and solve the telecommunications issues raised in these reports, with a serious commitment to ensure that RRR areas are not disadvantaged due to their population and postcode.

## 2. Scope of Submission

The BIRRR group has three key concerns regarding changes to the USO.

- a) The possibility that nbn™ becomes the provider of choice for both voice and broadband services.
- b) The inadequacy of existing nbn™ satellite and fixed wireless services in RRR areas to provide a basic level of internet data access and voice services to meet the needs of all Australians in the 21<sup>st</sup> century.
- c) The reliance on mobile broadband as a fixed voice and broadband service in RRR areas.

Our submission will work through why these concerns are justified, using real-life case studies and on the ground experience as evidence

## 3. INFORMATION REQUEST 6.1 – Adequacy of Satellite voice services.

*Participants are invited to provide evidence on the adequacy of NBN's satellite voice services in relation to defining an acceptable baseline for a universal service. Information on practical and cost effective alternatives to NBN's satellite voice services in areas that currently have no mobile coverage, and their relative merits and costs is also sought.*

### 3.1 BIRRR Response

nbn™ Sky Muster satellite is **not** an acceptable replacement for current baseline TUSO standards due to ongoing issues with:

- nbn™ network,
- nbn™ accountability and transparency
- reliability
- VoIP limitations
- affordability
- accessibility
- inferior technology to that already being received.

We urge the Productivity Commission to reconsider the number of businesses, residences and conceivably human lives that would be affected and even endangered by a removal of the USO on voice services for those mapped for nbn™ Sky Muster.

For those connected to nbn™ Sky Muster and Fixed Wireless services, the requirement to remain connected to the existing TUSO landline services is imperative. This should remain

in place until such a time that an alternative technology can provide a superior service to the existing TUSO.

**Managed VoIP over nbn™ Sky Muster and nbn™ fixed wireless services should not replace existing landlines.** Copper and TCRN services must be included in reformed USO guarantees. Currently NextG Wireless Link (NGWL) consumers have no guaranteed repair times and Telstra plans and information around these services are ambiguous. Many Australians (currently connected to ADSL but mapped for nbn™ Sky Muster) will receive an inferior service if nbn™ becomes the universal infrastructure provider. Where a consumer is mapped for a technology other than nbn™ fixed line it is imperative that current TUSO conditions are maintained.

**The problem and limitations with nbn™ Sky Muster outlined below are also an indication of the need to expand the USO to cover data services and to ensure that everyone living and working in Australia has access to a minimum level of data, with a guaranteed level of reliability at an affordable price.**

#### 4. Evidence on the inadequacy of nbn™ networks to deliver voice and data services to RRR Australians:

nbn™ has an extremely poor track record at maintaining their networks to telecommunications carrier standards. **nbn™ via Sky Muster satellites, cannot be currently entrusted to deliver voice and broadband services equitably, reliably and affordably to regional Australia. As per Appendix L, voice delivery was not a requirement in the Statement of Expectations presented to nbn™.**

It appears that one of the key reasons that Telstra was awarded a twenty-year contract in 2012 to provide an ongoing USO was the realisation that the NBN would not adequately meet the quality of service requirements consistent with the USO until some years after the NBN rollout was completed.

*Gregory, M. Innovation Australia, Dec. 2016*

##### 4.1 nbn™ Lack of Support & Information

nbn™ is not transparent and accountable when it comes to providing information and support regarding their Sky Muster and Fixed Wireless Services.

They do not offer direct support in troubleshooting Sky Muster connections or installations, all troubleshooting must go through a provider. This lack of direct communication allows nbn™ to maintain an 'arms length' situation, effectively avoiding any responsibility for the widespread issues experienced on the ground and mentioned in this submission. Please see attached **Appendix J** detailing installation and reliability issues with Sky Muster experienced by members of the Northern Territory Cattlemen's Association.

nbn have engaged a number of partners to assist with the design, construction, activation and assurance of the network. nbn's success is in part dependent on the successful operationalisation of contractual agreements and ongoing management of partners.

*nbnco 2017 p 61*

nbn™ delivery, activation and assurance partners have failed to deliver and have contributed to Sky Muster's 'teething problems' (which are ongoing 10 months after services first became active). Sky Muster installations were and still are plagued with issues. The Sky Muster rollout was uncoordinated, convoluted and results in many missed installs, non-working installs and huge levels of customer frustration.

This has caused considerable 'brand damage' to nbn™ and implanted a level of mistrust and uncertainty among consumers. With just 28 days remaining until Interim Satellite Services (ISS) switch off, there are still approximately 8000 'switch overs' to occur, many of these in areas where roads are impassable at this time of year. The advertised 'game changing' satellite is far removed from the real world experience of many RRR Sky Muster users.

#### BIRRR CASE STUDY 1

Annemarie lives 2 hours from Katherine in the Northern Territory on a remote cattle station. She was connected to Sky Muster in October 2016. Her service worked for 7 days and then stopped working on the 1st November 2016. Despite contacting her provider and nbn™ on numerous occasions, a tech visit could not be organized until the 5th January, 2017. The Network Termination Device (NTD) was replaced on the 5th January 2017, however the service was still not active. Annemarie's provider informed her she required another tech visit and this was scheduled for the 27th January 2017. This appointment was missed with no contact made and Annemarie still has no working Sky Muster connection. This Sky Muster user has experienced a period of 90 days without internet access.

Cases like Annemarie's are not rare and are not isolated incidents. BIRRR logged specific end user issues with Sky Muster services for the period November, 2016 to early January, 2017, until the exercise became too much work for the volunteer team. Sky Muster issues continue to consume the majority of BIRRR troubleshooting enquiries and have consistently totaled 150 – 200 cases **EACH WEEK** (BIRRR, 2017). These cases were end users who could not get further action on their problem from either their provider or nbn™.

Retail Service Providers (RSPs) have experienced an overwhelming demand for support for Sky Muster services. This has led to increased wait times for consumers and lengthy periods where customers are unable to access a connection; thus severely limiting business and education. Providers have had to employ extra staff and have had support reviews and customer satisfaction ratings decline due to Sky Muster teething issues that they have little control over. Even if the issue needs to be fixed by nbn™, there is no end user method of contacting nbn™ to resolve this. Instead a consumer needs to partake in a frustrating buck passing exercise to get a fault lodged for even simple problems such as a faulty power cord on the NTD.

RSPs have taken to social media and their websites to advise of 'exceptionally long wait

**Symptom: Exceptionally Long Wait Times – all communications affected.**

*Severity : Degraded*

*Status : Confirmed by call centre manager*

*Started at : 27/01/2017 8:00am*

*Expected End Time : To Be Advised*

*Unfortunately, due to faults on the NBN Skymuster platform, we have received an exceptional number of calls. We have staff working overtime to attend to your calls and emails, however call wait times are unacceptably long and the time to return callback requests is longer than we would like. We apologise for the inconvenience this may cause.*

*We will be sending out SMS notifications for fault updates as information becomes available.*

Figure 2 IPSTAR notification on exceptionally long wait times - <http://www.ipstarbroadband.com.au/status/>

times' due to 'faults on the nbn™ Sky Muster platform' (Figure 2 & Figure 10)

#### 4.1.1 Sky Muster v Fixed Wireless access

The BIRRR team has had success in helping some consumers who were 'on the fringe' of fixed wireless but mapped for Sky Muster. For end users on 'the fringe' of nbn™ map shading, it is a very frustrating exercise to have your service class changed to attempt a signal test. nbn™ have recently improved their contact centre in regards to cases such as these but still have a long way to go to improve customer service. There is a lack of information regarding non-standard installs and fixed wireless tower specifications (antennas tilted down, sectors not available, tower activation dates etc). Some customers have been informed by installers that, 'satellite is just as good as fixed wireless'. BIRRR has had many reports of installers not even trying to get a fixed wireless signal, relegating that residence to Sky Muster. Additionally, nbn™ mapping (versus actual on the ground signal tests) is not always a good indication of if a consumer can access the fixed wireless service.

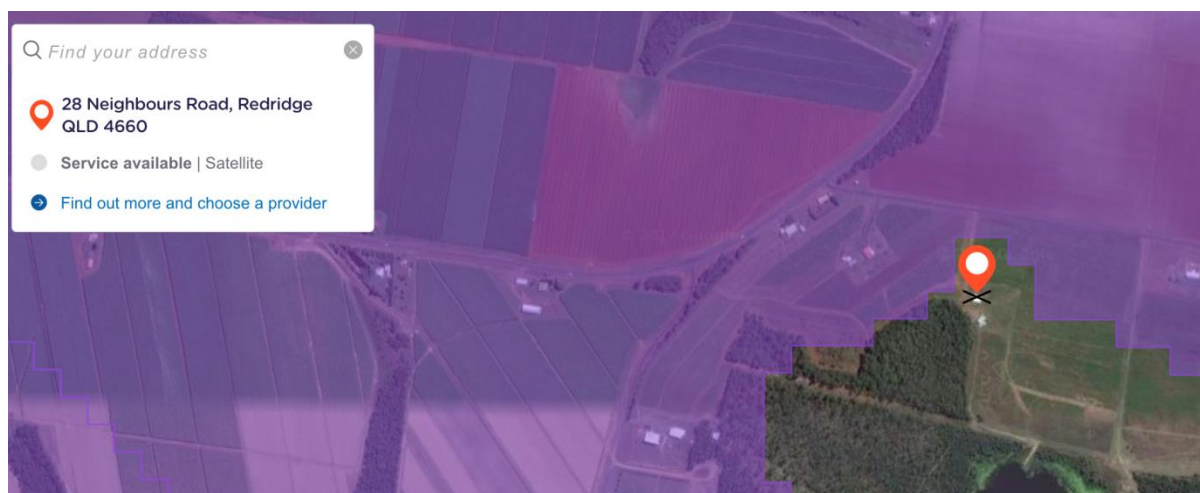


Figure 3 Example of house mapped for Sky Muster but able to receive fixed wireless signal

The red pin on **Figure 3** demonstrates a consumer's proximity to nbn™ Fixed Wireless, yet mapped for Sky Muster. Purple shading shows fixed wireless coverage area, areas not shaded are mapped for Sky Muster satellite. BIRRR has seen over 500 of these cases and are very concerned that many residences are being consigned to satellite when fixed wireless signal was available at the location.

For those who were connected to Sky Muster prior to the new nbn™ call centre initiative there is a lack of information on what their options may be. Even if they are prepared to spend extra money to get fixed wireless, via a wifi bridge, as they have already been connected to Sky Muster they are unable to access any other nbn™ technology. Other BIRRR members were initially mapped by nbn™ for Satellite, however have recently discovered that fixed wireless will be rolled out in their area. Other consumers were given no information on how to get a service class change, even though desk checks showed fixed wireless signal strength could be obtained at the location. Despite contacting nbn™ numerous cases such as these fall through the cracks and to date nbn™ do not have a migration plan for those who have been incorrectly installed to Sky Muster.



Figure 4 Example of mapped satellite residences proximity to existing fibre (<https://oztowers.com.au/>)

nbn™ mapping and website information is also lacking roll out dates and technology for many areas throughout Australia, causing confusion and frustration. Many end users cannot get their address to map and the ability to search by co-ordinates has been removed from the website causing further hindrance to order an nbn™ service. The length of time taken by nbn™ to address such issues is aggravating end users and further damaging the reputation of the organization.



## 4.2 nbn™ Troubleshooting & outage notifications

nbn™ currently have **no** effective outage notification system. End users should be able to report their service outage and access relevant information (similar to power outages). Some providers provide outage notices via websites and social media, others may send text message alerts. For an end user on Sky Muster satellite with no mobile coverage their only available communication method is their Plain Old Telephone Service (POTS). RRR residents are extremely resourceful and often ring a neighbor or family member to find out if there is an outage for their service. This information however is difficult to locate and often involves long wait times on hold with a provider or extensive detective work to find outages. If they do happen to finally discover why their service is not working there is usually no one who will take ownership of the issue. **Many end user Sky Muster faults and degradations are not reported because of this.** Reporting an outage or fault is incredibly laborious and extremely tedious. Most RRR people are not technology professionals and need access to technical support and expertise, the providers currently can't keep up with the demands and nbn™ do not provide any assistance. Thus, as a last resort consumers are ending up at BIRRR as they have exhausted all options in attempting to find someone to take ownership of their fault or problem. **86% of Sky Muster users have had issues with their connection** (see **Figure 5**)

## 4.3 nbn™ Sky Muster Limited Lifespan

The expected lifespan of the nbn™ Sky Muster is approximately 15 years and as such should only be viewed as an interim solution for RRR telecommunications. Furthermore, Sky Muster satellites are far below the minimum standard needed to ensure RRR areas do not fall further behind in digital connectivity. The PC should consider Sky Muster as a short-term solution only, that should be reserved for the truly remote and not those on the fringe of fixed and fixed wireless services. A greater effort needs to be made by nbn™ and its delivery partners to ensure consumers are connected to nbn™ fixed and fixed wireless services wherever possible.



# BIRRR Sky Muster Report



When Sky Muster works, it  
works WELL

OCT 26, 2016

**91% say the #datadrought is NOT over**

Average largest peak data plans = 55.5 GB & \$135/mth  
(Across 10 Providers)



**20%**

Had  
installation  
issues



**86%**

Have  
connection  
issues



**51%**

Main Use of  
Sky Muster is  
Business



**60%**

Doesn't meet  
their data  
needs



**36%**

Had cancelled  
installation  
appointments



**72%**

Are not Using  
Off Peak Data

**42% have no other internet service**

*Figure 5 BIRRR Sky Muster Survey Preliminary Data Statistics, 2016*

#### 4.4 nbn™ Fair Use Policy (FUP)

A complex Fair Use Policy (FUP) has been put in place by nbn™ to ensure providers limit the accessibility of the satellite. The consequence of the FUP is that Sky Muster users have significantly restrictive availability and data allowances. Due to the FUP providers have had to price higher data allowance plans to be unaffordable to discourage people from signing up to these. **The FUP restrictions do not take into account the following exponential increase in data requirements.**

Based on the above trends, data demand is forecast to continue to grow at 30 per cent or more year-on-year to 2020 and throughput requirements are forecast to increase (both download and upload), particularly in the home, as some end users look to use multiple sets of devices and applications simultaneously, and in some cases, continuously.

From March 2015 to June 2016, the average data consumption per household on the nbn™ network grew by 59 per cent to **137 GB** (download and upload) per month.

*nbnco 2017, p35*

Yet the average available peak data on Sky Muster services is just **55.5 GB** (BIRRR, **Appendix E**)

nbn co requires each customer to limit their Data Usage to no more than 150 GB in any four week period. Furthermore, nbn co requires each customer to limit their Peak Hour Data Usage to no more than 75 GB in any four week period. nbn co requires all RSPs to limit their **average customer Peak Hour Data Usage to no more than 30 GB of downloads and no more than 5 GB of uploads in any four week period**. As a result of this policy, plans with smaller data allowances represent better value than Plans with larger ones.

*Skymesh, 2016*

Off peak times are mandated by the FUP and are **1am – 7am** across all providers. The bulk of data for Sky Muster users is available during off peak times which confines productivity, innovation, education and essential services.

Despite having to restrict data to consumers, nbn™ has not supplied information to assist consumers with how to use off peak data or developed user -friendly usage tracking e.g. apps, real time data usage or usage data presented simply and graphically. Some providers have attempted to address these issues, however there is no across the board approach to end user information.

#### 4.5 nbn™ Network Congestion

From BIRRR's perspective, nbn™ RSPs appear very frustrated with the quality of nbn™ wholesale products. It is clearly apparent that the quality of nbn™ service provisioning and service assurance leaves much to be desired. This failure is most apparent in regional areas, where nbn™ Fixed Wireless and nbn™ Sky Muster are the primary modes of nbn™ service delivery.

Note: As Fibre to the Node (FTTN) has not yet rolled out in many regional areas, BIRRR cannot comment on this particular nbn™ product.

By way of example, both SkyMesh and Aussie Broadband senior managers have publicly expressed serious dissatisfaction at the service assurance of nbn™ Fixed Wireless. They claim that despite clear evidence of congestion on the over air and/or nbn™ back-haul segments, that customer faults are closed and dismissed without resolution. The situation is so bad that in response to a concerned customers frustration, Aussie Broadband has proposed the establishment of a public nbn™ Fixed Wireless service 'heat map' to expose the congested nbn™ Fixed Wireless towers (**Appendix K**). Providers cannot guarantee a VoIP service when there is congestion in the nbn™ Fixed Wireless Network.

Note: Sky Muster Service Provider frustration is also extremely high as identified elsewhere in this submission.

There are grave concerns that Sky Muster will also become congested before all projected customers are connected.

NBN Co's weekly progress report, which provides a high-level summary of premises passed across Australia, says 404,064 premises have been "covered" by the Long-Term Satellite service. Yet, in the 2016 corporate plan, the company states that satellite only has the capacity to service 250,000 premises at a time.

*jxeeno, 2016*

Updated data from nbn™ estimate 412,000 addresses are now mapped for Sky Muster satellite (pers. Comm. 11/1/17). Of further concern is the decision by nbn™ to change technology roll out for many RRR communities, increasing the satellite footprint and downgrading these communities to inferior services. Areas such as Urana, NSW & Kaniva, Victoria (**Figure 6**) who were once mapped for Fixed Wireless have been pushed onto the Sky Muster network.

Kaniva is an ideal site for a fixed fibre service; the service is currently available in the neighbouring town to the West (Bordertown) and is scheduled to be available in the neighbouring town to the East (Nhill). Kaniva is situated directly on the Western Highway, on the main optic fibre trunk. With a population of over 1,000 Kaniva would seem an obvious location for the installation of the fibre network.

*West Wimmera Shire Council, 2015*



Figure 6 Kaniva, Victoria Source Google Maps, Population at the 2011 census 1,061 (source ABS)

A comprehensive list of communities receiving large numbers of Sky Muster installations can be found here: <https://www.finder.com.au/nbn-who-gets-the-most-sky-muster-satellite-coverage>

#### 4.5.1 nbn™ Connectivity Virtual Circuit (CVC) Limitations

nbn™ uses the CVC to both bill and restrict excess use of nbn™ internet connectivity.

For Sky Muster providers, the CVC may cause service congestion on Sky Muster as RSPs are restricted from purchasing additional CVC capacity due to the Sky Muster FUP.

When small numbers of customers are connected to a small CVC there is insufficient dynamic capacity to ensure that all customers can use the service. RSP's attempt to load balance their customers between existing CVCs, but as there is no 'bulk move tool', this is very time consuming for the RSP.

It is nbn™ who determines when an RSP can buy additional CVC's or capacity within an existing CVC. This artificial restriction on providers impacts end user experience resulting in poor speeds and degraded services. See **Appendix H**.

#### 4.6 nbn™ Network Reliability

There have been numerous transitional problems with the rollout of the new nbn™ Sky Muster satellites, indicating that it is currently not meeting the PC suggested level of reliability of 99.7%.

Despite nbn™ statements that the entire network has reliable uptime of 99.9% (nbnco 2017, p17), BIRRR believe these claims cannot be substantiated for Sky Muster services.

BIRRR considers that the

*"99.7 per cent reliability target (compared to 99.9 per cent for nbn™ fixed-line and fixed wireless networks)*

is **NOT**

*"acceptable to the Australian community, particularly for emergency situations where private or public safety may be at risk and there is no back-up service, as rare as these events may be?"* USO Draft report pg 12

Levels of nbn™ Sky Muster reliability vary between beams, ground stations and providers and as such are difficult to report accurately. [REDACTED]

(pers. comm. nbn™, 10<sup>th</sup> January 2017).

In December nbn™ showed the following graph (**Figure 7**) to RRR stakeholders to highlight network availability. Despite assurances by nbn™ that outages have reduced, end users continue to experience issues with the network significantly affecting the availability and reliability of the service.

**IMAGE REMOVED DUE TO COMMERCIAL IN CONFIDENCE RESTRICTIONS**

*Figure 7 Commercial in Confidence Source: nbn™ 9th December 2016*

#### **What would 99.7% availability actually mean for a Sky Muster customer?**

99.7% availability would mean that a Sky Muster connection is not available for 26.48 hours in a year, or on average, **30 minutes each week** (Wikipedia 2016, See **Appendix C**).

As mentioned above, the target of 99.7% reliability has already been missed in the first month of 2017 for at least 1000 Bordenet end users. The BIRRR team hear stories daily of Sky Muster users who have no working connection, often for hours, days and even months at a time. Our administration team has personally experienced the frustration and disruption of having a service that is unreliable and limiting for both business and personal use. **Figure 8** shows a recording of the number of Sky Muster outages experienced by one BIRRR member between June and December, outages were only recorded when he was attempting to use the service.



This is the worst internet connection we've ever had. Dropouts happen daily. In December 2016, we had at least **33 outages**, some lasting a few minutes, many lasting up to an hour and some lasting for 2-3 hours. And there were probably many other outages when we weren't trying to use it. In short, it's awful, and we feel we're being ripped off every day. We live in a 'black spot' where there's very poor mobile coverage, so our only backup option is to go somewhere else and use free Wi-Fi on a tablet.

Sky Muster has made a significant difference to our connectivity - it made it much worse than [it] was with the interim satellite. We can't depend on it at all, and we can't get enough peak data at a reasonable price. We're scared to turn the modem off in case it takes hours to re-establish a connection (which was happening a while ago when we turned it off each night to save electricity). We hate it. If we had any other option, we'd dump Sky Muster.

*SA BIRRR Survey Response, 2017*

Furthermore, nbn<sup>TM</sup> Sky Muster has had considerable downtime due to software updates and maintenance,

*"The total number of network faults since launch is 325 with an average restoration time of 1.5 hours "*

*Senate Estimates 2016*

making the service completely unsuitable for emergency situations and business operations where consumers often have **no other communication method**.

<b>June/ July/ August</b>		<ul style="list-style-type: none"> <li>• Out for 2.5 days in <b>June or July</b></li> <li>• Out for 2.5 days <b>August 18-20</b></li> <li>• <b>Out August 30</b> - noticed at about 5:00am - back on at about 8:30am</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Out Sept 2</b> - noted at about 4:30pm - modem light flashing white - no connection. Came back in about 15 minutes. Went off again, flashing white light, after a couple of minutes - on again after about 10 minutes</li> <li>• <b>Out Sept 23</b> - noticed at about 7:00am - called Skymesh, message said they're 'aware of a problem' - came on at 8:45am</li> </ul>		<b>September</b>
<b>October</b>	<ul style="list-style-type: none"> <li>• <b>Out Oct 12</b> (white flashing light) - noticed at 3:00am - called Skymesh at 9:00am, message said they're 'aware of a problem'. Came on around noon.</li> <li>• <b>Out 29 Oct</b> - noticed at 8:00pm, still out 8:45am next morning. Rang skymesh - while waiting, recording suggested turning everything off and on again - did that. Modem took about 10 mins to get to blue light. Still no connection. called again 8:55am, on hold til 9:10am. Advised to detach modem and connect it again - didn't help. Jason ran 'tests' on the line and said it's an ongoing NBN maintenance issue, and we should have a connection by the end of the day.</li> <li>• <b>Connected at 10:55am 30th Oct</b></li> </ul>	
<ul style="list-style-type: none"> <li>• <b>Out 15 Nov</b> for about 15 mins</li> <li>• <b>Out 16 Nov</b> - noticed at 2:45pm, on at 3:15</li> </ul>		<b>November</b>
<b>December</b>	<ul style="list-style-type: none"> <li>• <b>Out Dec 4th</b> - started at 9:15am - White light - back on in about 10 minutes</li> <li>• <b>Out Dec 14th</b> - noticed about 4am, came on about 7:45am</li> <li>• <b>Out Dec 15th</b> - noticed about 4am, was on by 8am - don't know when came on</li> <li>• <b>Out Dec 16th</b> - as above</li> <li>• <b>Out Dec 17th intermittently</b> - noticed at 7:30am, very slow, sometimes working, or not</li> <li>• <b>Out Dec 19th</b> - noticed at about 4:30am - white pulsing light. Came on at 8:15am. Out intermittently through the day</li> <li>• <b>Out Dec 20</b> - noticed at about 3:45pm - white pulsing light - on at about 4pm. Out again, noticed at 4:50pm</li> <li>• <b>Out Dec 22</b> - noticed at about 1:30pm - blue light. Still off at 3pm. On at 3:15</li> <li>• <b>Out on Dec 23</b> - noticed at 2:45pm - blue light. Back at 3pm</li> <li>• <b>Out Dec 25</b> - noticed at 12:55pm - blue light. Back at 1:10pm. Out again at 1:15pm. Back by 2:20pm. Out again at 2:25pm. Back by 3:45pm. Out again at 3:55pm. Back by 4:15pm</li> <li>• <b>Out Dec 27</b> - 8:55am - white pulsing light. Back at 9:05am. Out again at 10:40am - white pulsing light. Back at 10:45am. Out again at 1:25pm - blue light. Back at 1:30pm, but slow. Out again at 1:34pm - blue light. Back at 1:35pm. Out again at 4:08pm - white pulsing light</li> <li>• <b>Out Dec 28</b> - noticed at around 2:30am - on and off intermittently, mostly off. On at 7:15am. Out again at 2:05pm - blue light. On again a few minutes later, then off again. Back on by 3:40pm</li> <li>• <b>Out Dec 29</b> - 1:45pm - blue light. Still out at 2:55. Back at 3:10pm. Out again at 3:25pm. Back by 3:35pm. Out again at 4:10pm</li> <li>• <b>Out Dec 30</b> - white light when turned on at about 4:15 am. Still off at 5:15am. On sometime before 7:00am. Out again at 7:05am - blue light. Back at 7:20am. Out again at 7:55am. Back by 8:20am. Out again at 2:05pm. Back on by 2:25pm</li> <li>• <b>Out Dec 31</b> - at 1:10pm - blue light. Back at 2:25pm. Out again at 2:30pm. Back at 2:45pm. Out again at 2:50pm. Back at 4:20pm. Out again at 4:30pm. Back on at 6:00. At 7:30pm, with nobody using it, an email arrived saying all the rest (about 1 Gb) of our monthly data had gone. Where????</li> <li>• <b>At least 33 outages in December 2016</b></li> </ul>	
<ul style="list-style-type: none"> <li>• <b>Out Jan 1</b> at 2:25pm - blue light. Back by 2:45</li> </ul>		<b>January</b>

Figure 8 Sky Muster unReliability record (BIRRR Member pers. comm. 2016)



BIRRR Sky Muster Survey Preliminary Data showed that 19.6% of respondents thought Sky Muster was not reliable, this equates to **57.5%** of end users, only 4.8% said it was reliable, which is **14%** of end users that answered the survey (BIRRR, 2017). These statistics are based on the responses from people actually using Sky Muster that answered the survey question and as such are more representative of on the ground end user experience. (See Figure 9)

	N	Percent	Percent of Cases
Yes it meets my speed needs	195	10.8%	31.8%
Yes - It meets my data needs	122	6.8%	19.9%
Yes - It's affordable	181	10.1%	29.5%
Yes - It's reliable	86	4.8%	14.0%
No - It does not meet my speed needs	257	14.3%	41.9%
No - It does not meet my data needs	376	20.9%	61.2%
No - It is not affordable	228	12.7%	37.1%
No - It is not reliable	353	19.6%	57.5%
	1798	100.0%	292.8%

Figure 9 BIRRR Sky Muster Survey, 2017

nbn<sup>TM</sup> statistics on network reliability do not take into account individual customer issues i.e. the customers power reliability, the need to turn equipment off for those on solar power, time taken to initialize the service after a power outage, customer satellite dish rain fade, customers' equipment and configuration, customer knowledge and time taken and customer ability to be able to contact support or a technical expert who can troubleshoot the connection.

Nor do they take into account specific provider issues such as CVC congestion, MAC Filtering, router failure etc. These have significant impacts and add to the overall availability and reliability of Sky Muster.

## 4.7 Repair Times

To date nbn<sup>TM</sup> have been unable to demonstrate that repairs can be handled in a timely fashion. Maintenance of a VoIP service is very complex as it involves:

- customer equipment
- nbn<sup>TM</sup>
- the Sky Muster provider and
- the providers VoIP Service Provider (VSP)

nbn<sup>TM</sup> state that they aim to meet timeframes for connections of services, repairs and appointments. These timeframes are **not guaranteed** and rely on an end users RSP lodging a ticket with nbn<sup>TM</sup>.

SkyMesh Customer Agreement Terms and Conditions:

The Service will be available to you at least 99 per cent of the time, averaged over a quarterly period, excluding outages caused by CPE failures and scheduled interruptions. In the event of a Service outage caused by a fault on the nbn™ or SkyMesh networks, we commit to restoration of the Service within 10 Business Days of being notified of the fault by you. If the restoration timeframes are not achieved, you will be entitled to a rebate of the daily charges for the days the service is offline in excess of the restoration timeframes.

*SkyMesh, 2015*

Some providers may offer rebates (at the providers expense) for Sky Muster services which are off line, however nbn™ does not provide outage credits under any circumstances.

**The Telecommunications Industry Ombudsman (TIO) has no jurisdiction over nbn™; nor any other wholesaler, leaving the customer with no route for compensation and restoration.**

Repair times are stated in the nbn™ *Service Levels Schedule Wholesale Broadband Agreement* (pg 16). nbn™ 'performance objectives' (not a guarantee) for the rectification of End User Faults from the time a Ticket is lodged that (nbn™ believe) requires a service call, depending on the customer's location, is between 5:00pm on the third Business Day and 5:00 pm on the tenth Business Day, but could be up to **90 calendar days** in Limited Access Areas. (nbnco Ltd 2016c, p.39) This does not reflect the time taken for a RSP to lodge a ticket, which usually occurs after several fault finding phone calls with the end user. Providers also state regularly that it is problematic to lodge faults with nbn™ and that often these incidents are logged and closed, only to need reopening again thus creating a exasperating experience for both the provider and end user (see **Appendix K**).

Any fault finding and repair of a Sky Muster VoIP service requires intensive involvement by the customer and the provider often for extended periods, with repair times measured in weeks and not days. The end user is intricately involved in the troubleshooting required to solve the issue, a fault cannot be lodged by the provider until this fault finding session (usually occurring over a POTS landline) occurs. A neighbor or friend cannot simply report the service as out of order, and an end user needs to be physically at the location of the installation with a reliable voice service in order to troubleshoot.

In contrast the maintenance and support of a POTS, is very straightforward. For a POTS service the customer first ensures that their handset is not faulty at the first point of entry and then calls Telstra or their provider. One call and the fault is lodged. The customer does nothing until the fault is relatively promptly repaired.

*"During October 2016 the average time for Sky Muster complaints to be resolved was 21.4 days."*

*Senate Estimates 2016*

#### BIRRR CASE STUDY 2

Sarah lives on an isolated cattle grazing property in Central Queensland, with no mobile coverage.

On the 10th November 2016 Sarah's Sky Muster ceased working following a storm.

After considerable troubleshooting with her provider (via her Landline) and contacting the BIRRR group for support (via her Landline), the problem was identified. A replacement Satellite - Network Termination Device (S-NTD) needed to be installed.

BIRRR attempted to escalate this issue as the customer had no internet service to run her business and participate in ante-natal requirements. Two nbn™ technician appointments were 'no shows', with no contact with the customer. One technician visit could not be completed due to 'incorrect address' even though Sarah had provided directions.

Finally on the 23rd December 2016, Sarah was successful in securing a replacement S-NTD following a technician visit.

In total, Sarah was left without a connection for **44 days**. This had a major impact on her grazing business and was very distressing for her during her pregnancy.

If Sarah did not have access to her POTS via TCRN she would not have been able to troubleshoot her connection, provide directions to the technician, run her business or contact help in an emergency, if so required.

From the BIRRR team's experience repair times can take many months compounded by issues including lack of support from provider, technician reschedules, delivery partner issues, no back up internet / phone line (so no way of troubleshooting the connection), poor customer service, installation issues, too many stages in the repair process and as such too many places the repair order can be lost. Alarming these are not isolated incidents, Sky Muster consumers, particularly those in remote locations, are finding themselves with no connection for many weeks and months at a time.

Actually lodging a fault with a provider is not a straightforward or fast process either. Average wait times to speak to a technician can be over an hour; none of the providers offer 24 hour customer service access and only three of the 10 Sky Muster providers have customer service operators available seven days a week including public holidays (**Figure 11**). As demonstrated in **Figure 10**, one provider demonstrates the difficulty in providing support to customers and the unacceptably long wait times experienced during Sky Muster outage periods.

User #329032 17451 posts  
**Paul Rees**  
**SkyMesh**  
ISP Representative

[tcb562 writes...](#)

Rang support line and they say aware of nbn satellite issues but there is nothing on the advisories.

Hi tcb562,

We have had an outage message on our Advisories page for over a month, and it's general in nature to cover all the business-destroying silliness that Sky Muster™ is inflicting on our customers ...

Exceptionally Long Wait Times

Severity : Degraded  
Status : Notified  
Started at : 01/08/2016 8:00am  
Expected End Time : To Be Advised

Unfortunately, due to faults and difficulties with nbn co's new Sky Muster service, we have received an exceptional number of calls to Sales, Support and Accounts. We have staff working overtime to attend to your calls and emails, however call wait times are unacceptably long and the time to return callback requests is longer than we would like. We apologise for the inconvenience this may cause.

[Ticket number 3167347](#)

I've asked Support to give you a call shortly.

Thanks, Paul

<http://vhrl.pl/ReH6eE>  
herring | anchor  
**Reply to this post**  
posted 2016-Sep-9, 4:39 pm

---

User #329032 17451 posts  
**Paul Rees**  
**SkyMesh**  
ISP Representative

[sixnon writes...](#)

I have to say that my initial warm glow regarding customer service is fading.

Hi Simon,

We have 45 staff, soon to be 60 (<http://imgur.com/a/dnaSY>), and 10,000 Sky Muster™ customers. When even 4,000 Sky Muster™ customers (one full CVC) go offline, we have no way to take all those calls. Now take that scenario and multiply it by one or two outages a day. That's when customer service starts to fade.

All we can tell customers when we eventually call them back is to reboot their modem and wait for it to come back online. We can lodge a fault but nbn co just waits until their issues have been fixed and they resolve all tickets with No Fault Found.

Remember the TV shows 'Lost' and 'Wrecked'? That's what it's like for Sky Muster™ customers, it's 'fend for yourselves' and please don't eat each other. :-)

Thanks, Paul

<http://vhrl.pl/ReH6hr>  
herring | anchor  
**Reply to this post**  
posted 2016-Sep-9, 4:51 pm

Figure 10 Customer service wait times (Whirlpool 2016)

SKY MUSTER - Provider Support Hours				
Providers	Local or Overseas	Mon - Fri	Weekends	Public Hol
Activ8me	O/S <sup>3</sup> / Local	8:00am to 8:00pm	8.00am - 5:00pm	-
Ant Com	Local	8:00am to 8:00pm	9.00am - 5:00pm	9.00am - 5.00pm <sup>1</sup>
Bordernet	Local	8:00am to 6:00pm	-	-
Clear Broadband	Local	9:00am - 6:00pm	-	-
Harbour ISP	Mainly O/S	8:30am to 9:00pm	9:00am to 9:00pm	9:00am to 3:00pm
IPSTAR	Not sure	8:00am to 7:00pm	9:00am to 5:30pm <sup>2</sup>	-
linet	Mainly O/S	5:00am to 6:00pm AWST	6:00am to 2:30pm AWST	-
Westnet	Mainly O/S	5:00am to 8:00pm AWST	5:00am to 8:00pm AWST	-
ReachNet	Not sure	7:00am to 6:00pm AWST	-	-
SkyMesh	Local	8:00am to 8:00pm	8:00am - 5:00pm	8.00am - 5.00pm

Note: All times are AEST unless stated

<sup>1</sup> Ant Special Days

- Christmas Eve, 9am - 3pm
- Christmas Day, Closed
- Boxing Day, Closed
- New Year's Eve, 9am - 3pm
- New Year's Day, Closed
- Good Friday, Closed

<sup>2</sup> Saturday ONLY

<sup>3</sup> 2nd Oz Centre Feb 2017

Figure 11 Sky Muster Providers' customer service operating hours

If landlines are aligned to the Sky Muster service, the end user with a fault would have **no communication available to them** and **no way of troubleshooting their connection**. It is a necessity that updated fully accountable and independently monitored Customer Service Guarantee (CSG) arrangements and reliability performance measures for all RRR telecommunications are delivered.

#### 4.8 Weather:

*“Clearly, not all premises within the satellite footprint will be equally affected....Signal attenuation (or rain fade), for example, may be more prevalent in parts of Australia that are more prone to heavy rain. That said, the rollout of nbn™ infrastructure is still progressing and actual levels of reliability are as yet unknown.”*

*PC USO Draft Report p16*

For areas of high rainfall it is essential TUSO standard voice services are maintained due to ‘rain fade’ issues on satellite systems. nbn™ Sky Muster is an all Ka band satellite system. Ku band, Very Small Aperture Terminal (VSAT) systems may provide up to 99.95% availability, while Ka band availability is generally poorer at around 99.5% for a similar VSAT cost. 99.5% availability means that a customer can be off line due to weather effects, for up to **50 minutes per week or greater**. Sky Muster customers are recording weather related outage events of these magnitudes, on a regular basis. In addition, rain fade affects the major earth stations and not only customer dishes. When weather takes out an earth station it also takes out thousands of Sky Muster services.

#### The relationship between SkyMuster beams and Earth Station Gateways

Once your SKY MUSTER™ beam is established, this chart identifies your Earth Station Gateway

Bourke NSW	Broken Hill NSW	Carnarvon WA	Ceduna SA	Geeveston TAS
Beam 3 - Whitsundays, QLD Beam 14 - Goomally, QLD Beam 24 - Toowoomb , QLD Beam 26 - Bourke, NSW Beam 52 - Wilsons Promontory, VIC Beam 55 - Launceston, TAS Beam 58 - Top End (small beam), NT Beam 60 - Meekatharra, WA Beam 61 - Geraldton, WA Beam 70 - Esperance, WA Beam 71 - Cocos Is, Cocos	Beam 4 - Maxwellton, QLD Beam 22 - Bollon, QLD Beam 30 - Ceduna, SA Beam 33 - Mudgee, NSW Beam 44 - South Adelaide, SA Beam 48 - Victorian Alp , VIC Beam 54 - Burnie, TAS Beam 82 - Victoria River, NT Beam 87 - Newman, WA Beam 88 - Gibson Desert, WA Beam 91 - Hughenden , QLD Beam 95 - Oodnadatta, SA Beam 97 - Ravensthorpe, WA	Beam 7 - Mackay, QLD Beam 11 - Rockhampton, QLD Beam 28 - Tamworth, NSW Beam 32 - Dubbo, NSW Beam 39 - Hay, NSW Beam 40 - Griffith, NSW Beam 73 - Macquarie Is Beam 79 - Cape York, QLD Beam 85 - Cooktown, QLD Beam 86 - Carnarvon, WA Beam 96 - Birdsville, QLD Beam 99 - Ceduna, SA (large beam) Beam 101 - Cobar, NSW	Beam 1 - Cairns, QLD Beam 12 - Blackall QLD Beam 15 - Gladstone, QLD Beam 47 - Shepparton, VIC Beam 72 - Christmas Is Beam 76 - Wyndham, WA Beam 84 - Southern Gulf of Carpentaria Beam 98 - Cocklebidy, WA Beam 100 - Broken Hill, NSW	<b>Beam 6</b> Beam 6 - Mount Wyatt, QLD Beam 8 - Longreach, QLD Beam 46 - Horsham, VIC Beam 51 - Melbourne, VIC Beam 53 - Orbst, VIC Beam 62 - Mt Magnet, WA Beam 67 - Narrogin, WA Beam 74 - Lord Howe Is
Geraldton WA	Kalgoorlie WA TT&C Site	Roma QLD	Waroona WA	Wolumla NSW TT&C Site
Beam 05 - Torrens Creek, QLD Beam 21 - Cunnamulla, QLD Beam 23 - Goondiwindi, QLD Beam 25 - Brisbane, QLD Beam 27 - Lightning Ridge, NSW Beam 31 - Port Augusta, SA Beam 42 - Sydney, NSW Beam 45 - Bordertown, SA Beam 49 - Merimbula, NSW Beam 77 - Top End, NT (Large Beam) Beam 78 - Northern Gulf of Carpentaria, NT Beam 89 - Alice Springs, NT Beam 90 - Mt Isa, QLD Beam 92 - Mt Magnet, WA (Large Beam) Beam 94 - North West, SA	Beam 10 - Clermont, QLD Beam 13 - Mantuan Downs, QLD Beam 20 - Gympie, QLD Beam 34 - Forster, NSW Beam 36 - Whyalla, SA Beam 43 - Kangaroo Island, SA Beam 56 - Hobart, TAS Beam 64 - Koorda, WA Beam 68 - Augusta, WA	Beam 09 - Galilee Basin, QLD Beam 18 - Roma, QLD Beam 29 - Coffs Harbour, NSW Beam 35 - Port Lincoln, SA Beam 37 - Adelaide, SA Beam 50 - Warrnambool, VIC Beam 57 - Bamaga, QLD Beam 59 - Fitzroy Crossing, WA Beam 63 - Cervantes, WA Beam 65 - Leonora, WA Beam 80 - Port Headland, WA Beam 81 - Derby, WA Beam 83 - Newcastle Waters, NT Beam 93 - Goldfield Region, WA	Beam 2 - Townsville, QLD Beam 16 - Bundaberg, QLD Beam 17 - Charleville, QLD Beam 19 - Chinchilla, QLD Beam 38 - Mildura VIC Beam 41 - Canberra, ACT Beam 66 - Perth, WA Beam 69 - Albany, WA Beam 75 - Norfolk Is	<b>Standby site</b> Wolumla near Merimbula, can assume control of beams from any other Earth Station, in order to provide service in the event of catastrophic failure

Telemetry, tracking, and command (TT&C) sites monitor & control the spacecrafts health and location.

Figure 12 The relationship between Sky Muster beams and Earth station gateways, BIRRR, 2017

On the afternoon of the 29<sup>th</sup> January, 2017 whilst preparing this submission, BIRRR admin Kristy Sparrow experienced several outages with her Sky Muster service. Kristy is located in Central Queensland, Sky Muster Beam 10, Kalgoorlie Ground Station. After investigation (in between outages) Kristy discovered others with similar issues who were also connected to the Kalgoorlie Ground Station, and that a rain event (figure 13) was occurring at the ground station (not at Kristy's physical address) during the time of the outages. This caused Kristy's Sky Muster to experience three separate outages totaling 70 minutes. Kristy also had issues with her service on 26<sup>th</sup> January – two outages totaling 8 hours and on the 27<sup>th</sup> of January – several outages of 2 – 10 minutes throughout the day.



**NB:** Without accurate Australian continent Ka band modelling data, the above is a generalised estimation based on worldwide data. The attenuation affect of rainfall at Ka vs Ku frequencies is three to four fold higher.

3/02/2017



availability due to rain fade alone, is considerably poorer than previous Ku band satellites systems, such as the nbn™ Interim Satellite Service (ISS).

This white paper refers to Ku as 99%+ and Ka 'struggling' to achieve 99% (Harris Cap Rock 2012).

The use of spot beams improves Ka-band performance, but links with Ku-band spot beams remain much more reliable. Obtaining the same level of link availability (say 99%+) in a Ka spot beam, would require exponentially more transponder power than a comparable link and antenna size in Ku-band. It is therefore much more difficult and expensive to provide high availability and reliable services in Ka-band than in Ku-band – particularly in regions where heavy rainfall is common.

The above explains why Sky Muster will have poorer availability than the Ku band satellites that have previously been operational in Australia. This means that not all nbn™ Sky Muster services will operate equally, depending on the density and frequency of rain. Those in northern Australia will experience poor performance in monsoon times and their service availability will be poorer than those in the south.

The 'Days of Thunder' map by the Bureau of Meteorology (**Figure 14**, BOM 2016) is a very good indicator of those who will suffer most. 'Thunder' will generally indicate cumulus nimbus cloud formations, which in turn carry the highest moisture density due to their height.

At the 2015 Isolated Childrens Parents Association (ICPA) Qld Inc State Conference, representatives of nbn™ advised delegates that the nbn™ Sky Muster satellite service would be adversely affected by some weather conditions and that anyone relying on this service could expect service failure or severe degradation of more than ten days a year especially in locations above the Tropic of Capricorn.

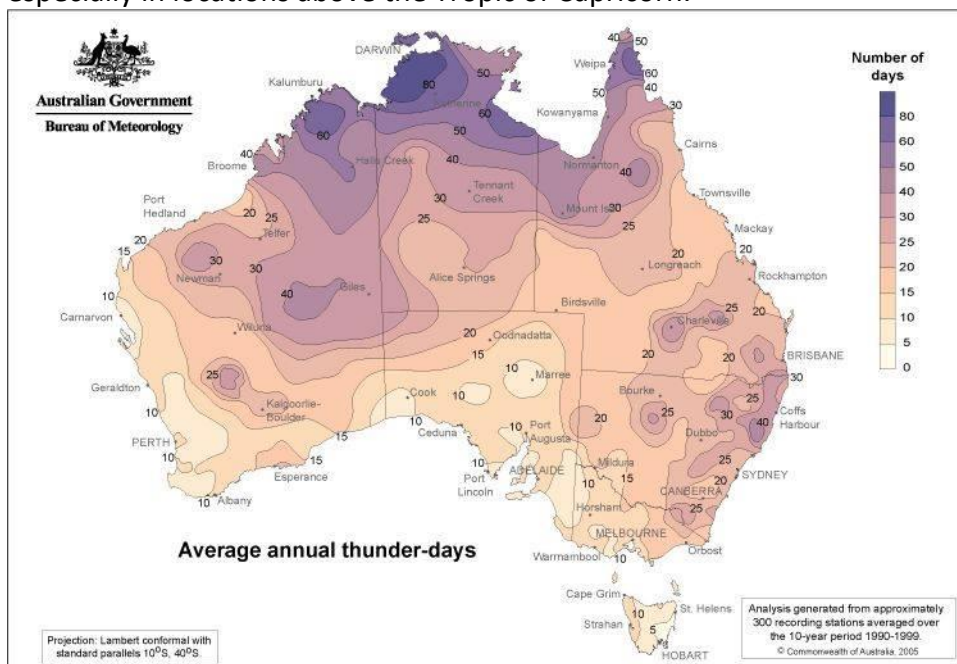


Figure 14 'Days of Thunder' (BOM 2016)



**Appendix B** provides a BIRRR member's detailed example of the impact of rain fade.

Recent anecdotal evidence has shown that Sky Muster performs poorly even in minor rain events with outages occurring during small isolated storms. During extreme weather events, nbn™ Sky Muster cannot guarantee voice and broadband services and offers users an inferior level of reliability than previous satellites and current USO agreements for voice services.

#### 4.9 Power Outages:

Power outages regularly occur in rural and remote areas, especially in emergencies such as fire, flood and storm. Current landline technologies usually continue to work during these times however nbn™ Sky Muster and fixed wireless services will not. This is due to the robustness of the existing TUSO network for these services in the event of a major incident/outage (such as power) that can affect Satellite and Wireless services (including mobile phones). For example during December 2016, many premises in the Adelaide Hills, South Australia experienced a power outage for three days (due to fallen trees on power lines). South Australia also experienced a statewide blackout in September 2016. Whilst TUSO landlines continued to operate, some of these residences are mapped for nbn™ Sky Muster Satellite and would effectively lose all communication if a similar event occurred. Mobile phone towers also start to fail after a few hours due to the battery backups failing.

**nbn™ equipment will not work without power. As instructed by nbn™ end users should continue connections with landline phone services.**

“The equipment to operate Fixed Wireless and Satellite phone and/or internet services needs electricity and won't work in a power outage. When ordering an nbn service in Fixed Wireless or Satellite areas, have a discussion with your service provider about your existing landline. **If you have an existing copper phone line it is important to consider keeping it in service for emergency communications,** especially if you don't have good mobile phone coverage at your home or business.”

Just over 11% of Sky Muster users are off grid and use solar power or generator power (See **Figure 15**, BIRRR 2017), having Sky Muster as a stand alone telecommunications service would be disastrous for these consumers due to the time taken to 'power up' the Sky Muster NTD. In the event of an emergency these precious minutes could be a matter of life or death.

##### BIRRR Case Study 4

Ian has no mobile phone reception, he is off-grid for power and cannot have Sky Muster running 24 hours/day without a considerable investment in batteries, Sky Muster's turn on time is too slow if Ian needs it for an emergency when it's turned off for the night.

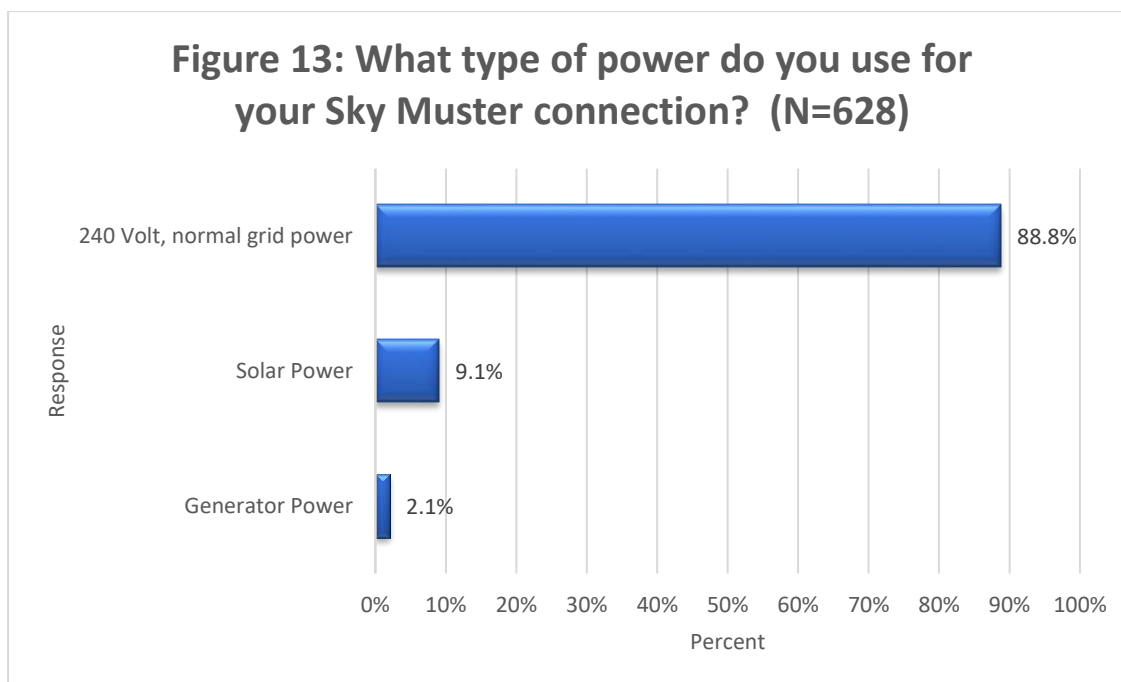


Figure 15 Type of Power Used for Sky Muster Connection, BIRRR , 2017

## 5. Managed and Non Managed VoIP LIMITATIONS

Voice over Internet Protocol (VoIP) is the transport of voice traffic inside data packets over the internet. VoIP calls can be either 'Managed VoIP' provided by a retail service provider that is similar to traditional telephony, or 'Over-the-Top VoIP' that is provided on a best efforts basis by third parties (such as Skype and Apple FaceTime). The limitations in this section of the BIRRR submission (with the exception of 5.8 Wifi Calling) refer to the managed VoIP service on Sky Muster and other nbn<sup>TM</sup> technologies.

To understand managed VoIP and its many limitations, it must be compared to how voice services are traditionally provided. The Legacy Public Switched Telephone Network (PSTN) is a Carrier Grade network and provides very high availability known as five nines i.e. 99.999 % or on average, 6 minutes downtime per year

With the advent of the nbn<sup>TM</sup> network; there is an opportunity to transfer fixed line voice services, to a new voice medium; Voice over Internet Protocol (VoIP), an internet protocol (IP) based telephony service. Successful VoIP requires a very reliable internet service, as VoIP traffic is embedded in the internet data. nbn<sup>TM</sup> is progressively rolling out a form of internet, to all Australian households. Within the nbn<sup>TM</sup> service delivery model, there are many different nbn<sup>TM</sup> products of wildly varying service availability, largely depending on location. As a generalization, as customers become more remote, the poorer the nbn<sup>TM</sup> network reliability. VoIP requires a Voice Service Provider (VSP) who manages the voice call switching, billing and other essential service requirements.

Minimum Internet Quality of Service (QoS) parameters are fundamental for a successful VoIP service. With the exception of fibre to the premise (FTTP), VoIP over other nbn<sup>TM</sup>

Customer Access Network (CAN) variants may fail to meet minimum QoS parameters, due to the potential for network contention during periods of high internet activity, times of network fault or times of network degradation within the shared nbn™ network capacity of that technology. Shared nbn™ CAN capacity, is one of the many problems of the nbn™ network model that impacts on VoIP QoS.

### **Customer Service Guarantee**

Prior to the provisioning of any nbn™ Voice Service (VoIP), **customers must abrogate the Australian Communication and Media Authority (ACMA) regulated home phone Customer Service Guarantee (CSG)** (ACMA, 2016)

The CSG establishes performance standards that telephone service providers must meet or exceed for appointments and the connection and repair of standard telephone services (and certain enhanced call-handling features). If a provider fails to meet a performance standard, the customer may be eligible for compensation from their provider.

Voice Service Providers (VSPs) who deliver VoIP services over the internet understand that they cannot deliver CSG compliant service.

BIRRR strongly recommends that the telephone Customer Service Guarantee is both retained and expanded. It is recommended that a common VoIP service standard is established and enforced for all Australian VoIP providers to further strengthen the existing telephone Customer Service Guarantee.

### **Essential VoIP QoS Parameters**

nbn™ Sky Muster customers suffer large latency delays, due to the very long connection path over the nbn™ Sky Muster geostationary satellite network. A geostationary satellite circuit path introduces 600ms plus latency, which is troublesome for conversations and customers may also encounter frustrating echo. High latency makes it difficult to hold a fluid conversation, as participants continually interrupt each other. Excessive network jitter causes word and syllable clipping reducing intelligibility, whilst any network packet loss guarantees a very poor voice experience for both parties. According to 2017 BIRRR survey data, just over 10% of nbn™ Sky Muster users have established a VoIP service. This is most likely due to the complexity of establishing a service and lack of support to the end user.

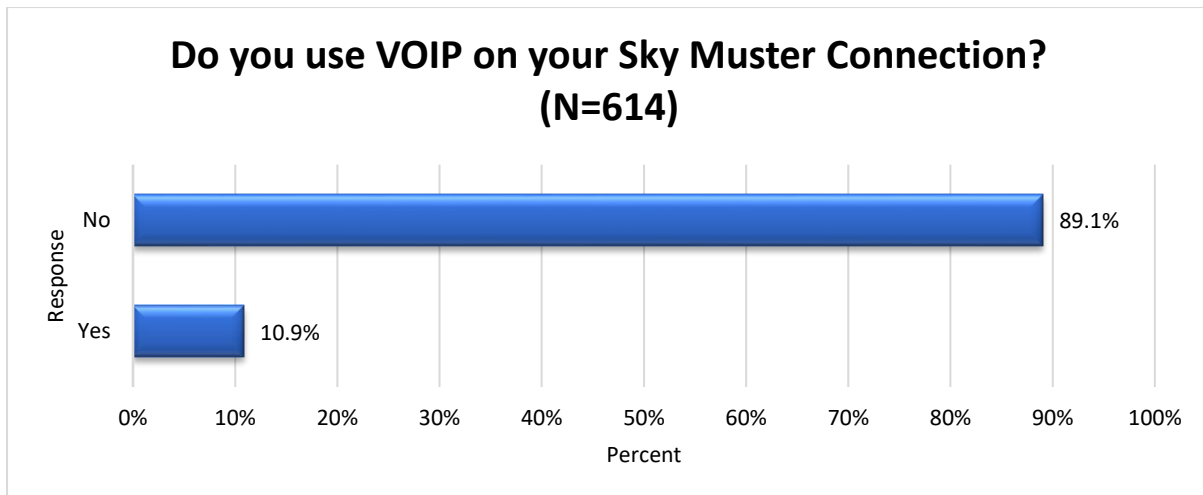


Figure 16 Consumers who use VoIP on Sky Muster, BIRRR , 2017

For any nbn<sup>TM</sup> VoIP service and especially those on Sky Muster, there are several important internet Quality of Service (QoS) factors that require careful consideration.

**BIRRR submits that all nbn<sup>TM</sup> national voice traffic must fully comply with International Telecommunications Union (ITU) standards.** VoIP QoS parameters must meet the following well accepted guidelines; if it is to become a baseline voice service.

- Latency** – A delay of less than **150 milliseconds** is acceptable, whilst a delay greater than **400 milliseconds** is unacceptable. The only nbn<sup>TM</sup> CAN that is consistently non-compliant with this standard, is nbn<sup>TM</sup> Sky Muster. Sky Muster exhibits latencies between **550ms – >650ms**. The magnitude of Sky Muster latency is also dependent on which earth station a customer's spot beam is associated with. ITU standard G.114 describes voice call latency or delay. see <https://en.wikipedia.org/wiki/G.114>
- Jitter** – Jitter is a measurement of latency variability over time. Network jitter within the Customer Access Network should not exceed **100ms**, whilst the backbone network should contribute less than **1ms**. With the exception of nbn<sup>TM</sup> fibre (FTTN), nbn<sup>TM</sup> CAN's are subject to network contention (due to shared customer network elements), which induces network jitter. A jitter component greater than **150ms** is commonplace on Sky Muster; more so during the frequent periods of network degradation. Without access to detailed nbn<sup>TM</sup> network jitter data, BIRRR cannot confirm that other contended nbn<sup>TM</sup> CAN products satisfactorily meet maximum jitter specifications. Please see **Appendix G** for a Sky Muster user's experience with Jitter measurement.

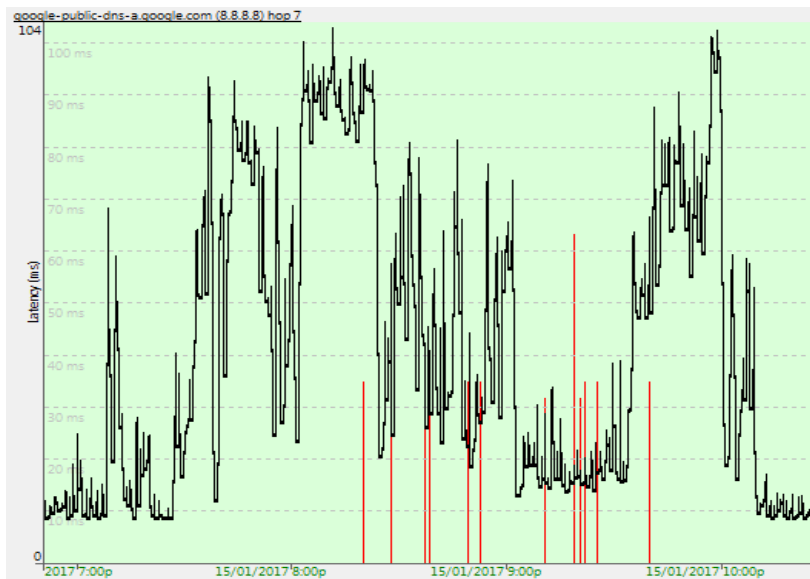


Figure 17 Contention induced jitter on a Fibre to the Node (FTTN) service exceeding 100ms, during the evening

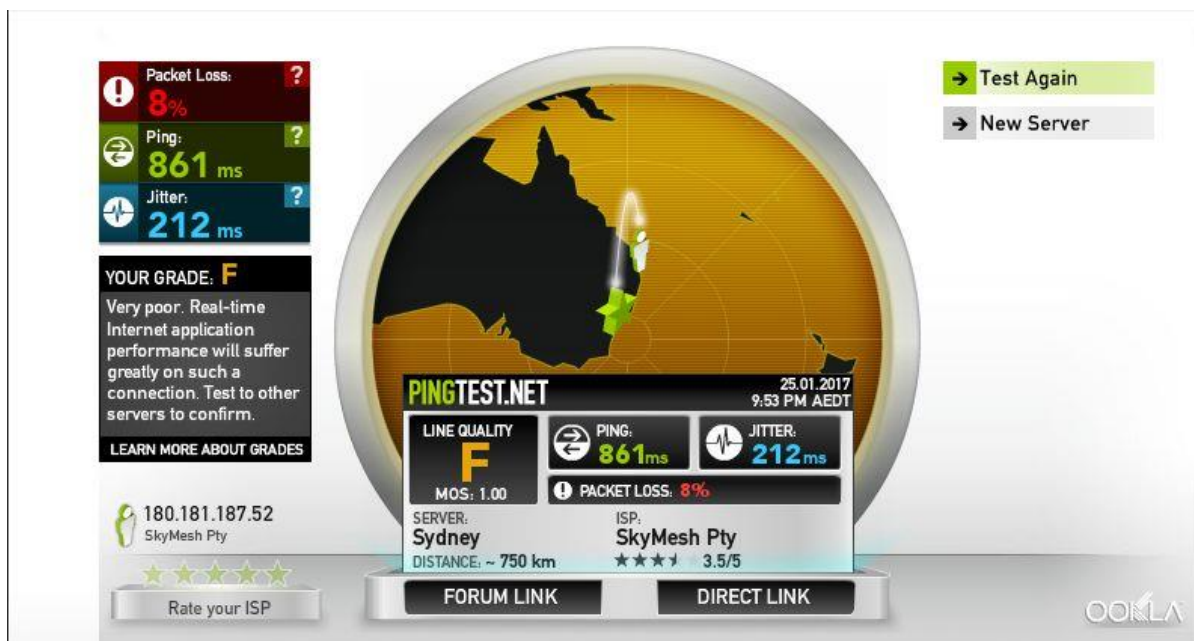


Figure 18 Contention induced jitter on a Sky Muster service exceeding 100ms, during the evening

- Packet Loss** – Packet Loss is the measure of data packets that are sent over the internet; but not received at the destination. For a successful VoIP call, Packet loss must not exceed one percent (1%). Ideally, there should be no packet loss.

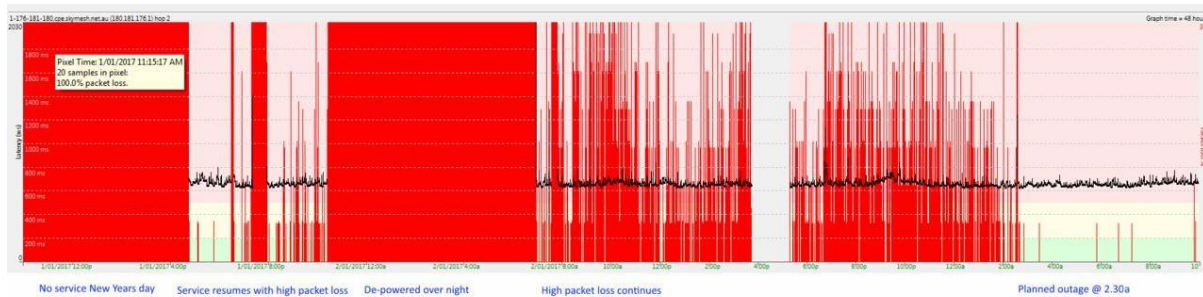


Figure 19 An example of extremely high packet (> 50%) loss over an extended period on Sky Muster

## 5.1 One Line

nbn™ limits consumers VoIP connectivity on Sky Muster. The TC-1 allocation (the slice of an nbn™ connection that carries VoIP) is 150KB per Sky Muster customer service. As a direct consequence, participating Sky Muster Provider VoIP services are limited to 'one phone line per service'. A customer may engage their own third party VSP, however for third party VoIP providers, the reliability of the VoIP traffic is severely compromised, as return VoIP packets (the nbn™ customer receive path) may not travel via the intended high priority TC-1 path. **Businesses require multiple voice lines that are secure and operate 24 hours per day. Sky Muster VoIP is an unsuitable replacement for TUSO fixed landlines.**

Distance education currently relies on secure POTS calls for communication between student and teacher. There are over 4000 distance education students in Australia, a majority of whom would rely on Sky Muster (FED ICPA, 2017). Interactive video conferences are established over the internet during lessons, but in the majority of cases, voice communications are carried via the secure Public Switched Telephone Network (PSTN). This same secure voice communication methodology is essential for the future of distance education, where multiple students doing different lessons and programs are often engaged at the same residence.

## 5.2 Customer Experience

The experience to date for customers who have trialled Sky Muster VoIP is disheartening. Apart from Sky Muster service availability and reliability woes (listed elsewhere), not all Sky Muster providers currently offer a VoIP service and the VoIP service parameters appear to vary widely. Sky Muster customer VoIP experience varies considerably. Success is largely dependent on the provider's skill and support. The primary Sky Muster customer VoIP concerns are dropouts, echo, distortion and service availability.

## Provider Service Parameters

The following (**Figure 19**) is an attempt to identify current Sky Muster VoIP provider key service parameters. Each of the service features identified below are a fundamental offering of the legacy PSTN network.

Note: Whilst all care has been taken in compiling this information from data publicly available on the service provider's website, it was an extraordinarily difficult exercise, as there is no standard for VoIP service provision.

Sky Muster VoIP Providers - No Contract VoIP Plan with Inbound & Outbound calls - January 2017										
Provider	VoIP	Voice Mail	Call 1900	Local No.	Call 1300	Basic Plan/Mth	Port existing Phone No.	White Pages Listing	Set-up Fee	Cheapest VoIP Equipment Fee (one off)
Activ8me	Yes	Yes	No	???	Yes	\$10.00	\$30	???	No	\$115.00 or BYO
Ant Com	Yes	Yes	No	???	Yes	\$9.95	???	???	No	\$129.00 or BYO @ \$25.00
Bordnet	No Bordernet VoIP service offered									
Clear Broadband	Yes	Yes	???	Cap	???	\$12.95	NO	???	???	~ \$99.95 + \$15 Ship or BYO
Harbour ISP	Yes	\$4 / Mo	???	???	???	\$10.00	\$50	Free (optional)	\$99 no Contract	\$70 to \$155 or BYO @ \$20.00
IPSTAR	Yes	???	???	Geo	???	\$9.95	NO	???	No	\$65 + \$10 Ship
linet	Yes	Yes	???	???	???	\$9.95	???	???	No	~ \$89 (obscure)
Westnet	Yes	Yes	???	???	???	\$9.95	???	???	No	~ \$89 (obscure)
ReachNet	Yes	???	???	Geo	Yes	\$10.00	???	???	???	Free (12 Month Contract)
SkyMesh	Yes	Free	No	Yes	Yes	\$10.00	Free	Free (optional)	No	\$80 or BYO Cisco ATA @ \$30.00

**Notes:** **???** Information not found on the providers website despite diligent appraisal  
**Cap** Capital City Number only. Regional callers will be charged at STD rates.  
**Geo** Geographic number only. No guarantee that you can be called at local number rates

Figure 20 Sky Muster VoIP providers Parameters, BIRRR 2017



## Typical nbn™ Retail Service Provider VoIP Disclaimers

The following is a compilation by BIRRR of typical VoIP provider disclaimers:

**Q.** *Can I call 000 Emergency Services using VOIP*

**A.** You can, however it is recommended that this service is only used as an adjunct to your existing telecommunication services and that you have another fixed line service or mobile phone (with signal available), in case you need to make an emergency call. Emergency services must ask VoIP callers to confirm their address, as they cannot be certain that you are using the service from the address that it was ordered from.

**Q.** *Can I use a fax machine with the service?*

**A.** If the provider has enabled T.38, some fax machines may support faxing, but as VOIP is a relatively new technology, many do not. If your fax machine cannot be upgraded to support VoIP or does not operate properly with your router or Analogue Telephone Adapter (ATA), then you may not be able to use your fax over your VoIP service.

**Q.** *Can I have more than one phone service on Sky Muster?*

**A.** It may be possible that two VoIP services might be configured by a Sky Muster provider, however should a customer conduct more than one call at a time, the call quality may suffer and both calls may be unintelligible.

**Q.** *Will I get a local number? Note: Many providers cannot offer customers a local exchange number.*

**A.** It is no longer an ACMA requirement that Carriage Service Provider (CSP) provide new telephone service customers with a telephone number that is local to their area. Non-local exchange numbers are called Regional Numbers and consist of the area code (two x digits) plus the next two digits of the 10-digit national number e.g. 02 65xx xxx where 'x' may be almost any digit value. There is no guarantee that the Regional Number will be within the customers local Standard Zone Units (SZU). Parties who call the number may be charged as if the customer is located in the SZU for the new number and the customer may not be able to port this number to another CSP. As a minimum you may choose generally a number from about 20 capital city and regional exchanges. Some providers do this better than others and some may be able to provide a standard zone unit number for your physical location. There is no guarantee that customers will be offered a local exchange number by the chosen CSP.

**Figure 20** is an actual customer VoIP service numbering problem as asked on the BIRRR Facebook site. The answer below is by Paul Rees, the Managing Director of SkyMesh Pty Ltd. SkyMesh is a Sky Muster Retail Service Provider.

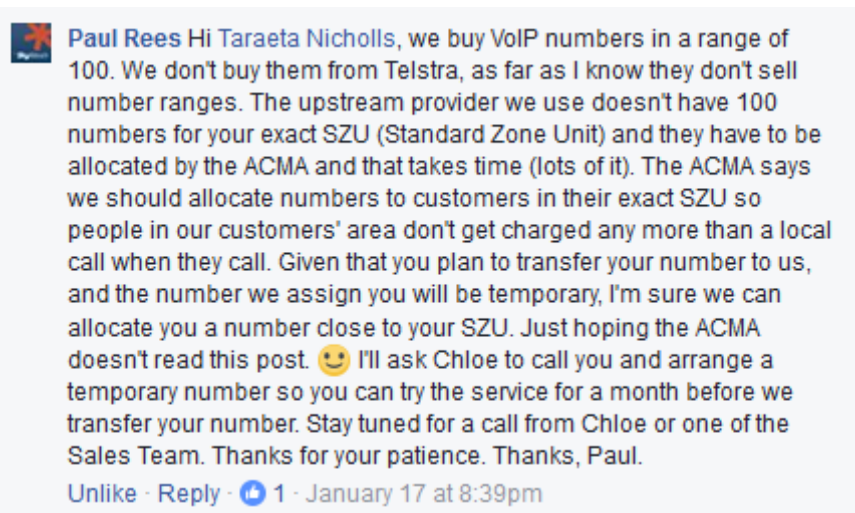


Figure 21 Local number on Sky Muster answer

**Q.** *Is Priority Assistance® available with Sky Muster VoIP?*

**A.** Priority Assistance® is not available with Sky Muster VoIP.

**Q.** *Are any calls free?*

**A.** Yes calls to 1800 services are generally free and your Provider may offer free calls within their VoIP network i.e. to other same Provider customers.

**Q.** *Will an installer come to my home and provision the VoIP service*

**A.** The service is provided on a self-install basis and you will need to plug in the hardware and your telephone yourself. An installer will not visit you.

**Q.** *Will my VoIP service work if I am shaped?*

**A.** We cannot guarantee that your VoIP service will work if you are shaped.

**Q.** *Will my new Sky Muster VoIP service keep the same Customer Service Guarantee of my old land line phone?*

**A.** **No. We will ask you to waive all rights to the CSG prior to service connection.**

## 000 Emergency services

It is apparent that the majority of VoIP providers provide a **000**-calling service. Voice Service Providers register the applicant's address, as the number location in the 000 database.

Unlike landline services, the portable nature of VoIP may render the 000-data base address meaningless. As for mobile calls, 000 operators will always confirm a VoIP caller's address.

If the caller cannot provide these details, the outcome could well be tragic.

### 5.3 Maintenance

The maintenance of a VoIP service is much more complex than that of the Plain Old Telephone Service (POTS) as it involves additional customer owned and maintained equipment at the customer premise (VoIP router etc), which must be both powered and correctly configured. Identifying faults is complex and any repair of a VoIP service by definition of its complexity; takes longer.

The necessary complexity of a VoIP service is such that a VoIP customer must contact their provider for any VoIP service outage, failure or degradation. Customers must patiently work through a tedious chain of tests and procedures with their voice service and internet provider to identify the possible cause of failure.

A further grave concern affecting service assurance of VoIP services is the Sky Muster provider support hours (see **Figure 11**).

### 5.4 Data Limits & Shaping

As discussed in section 4. 4, the imposition of data limits imposed by the nbn<sup>TM</sup> Fair Use Policy will likely affect access to VoIP services. Many Sky Muster customers already find themselves shaped before the end of their monthly billing period.

Each nbn<sup>TM</sup> Sky Muster service provider is contracted by nbn<sup>TM</sup> to shape the service to 128kbps down and 128 kbps up, once the customer data quotas have been reached. If a customer continues to consume excess data at this shaped rate, the provider must progressively shape the service to zero. In addition, the nbn<sup>TM</sup> Sky Muster Fair Use Policy (which is outside the control of service providers), reserves the right by nbn<sup>TM</sup> to immediately suspend or terminate a services that severely or continually breaches that policy.

Typically a VoIP service requires 100kbps of reliable, low latency and low jitter bandwidth, for satisfactory service. When a customer's service is shaped by a provider, the customer's service is limited to 128kbps/ 128kbps.

A correctly configured Sky Muster VoIP service MAY continue to operate on a shaped 128kbps/ 128kbps service. It is critical for a continued service whilst shaped, that VoIP is correctly configured and is carried within the reserved TC-1 capacity, in both the transmit and receive paths.

VoIP will not work when shaped if:

- a). the service is incorrectly configured
- b). if further shaping is applied by the provider,
- c). if nbn<sup>TM</sup> excludes the service.

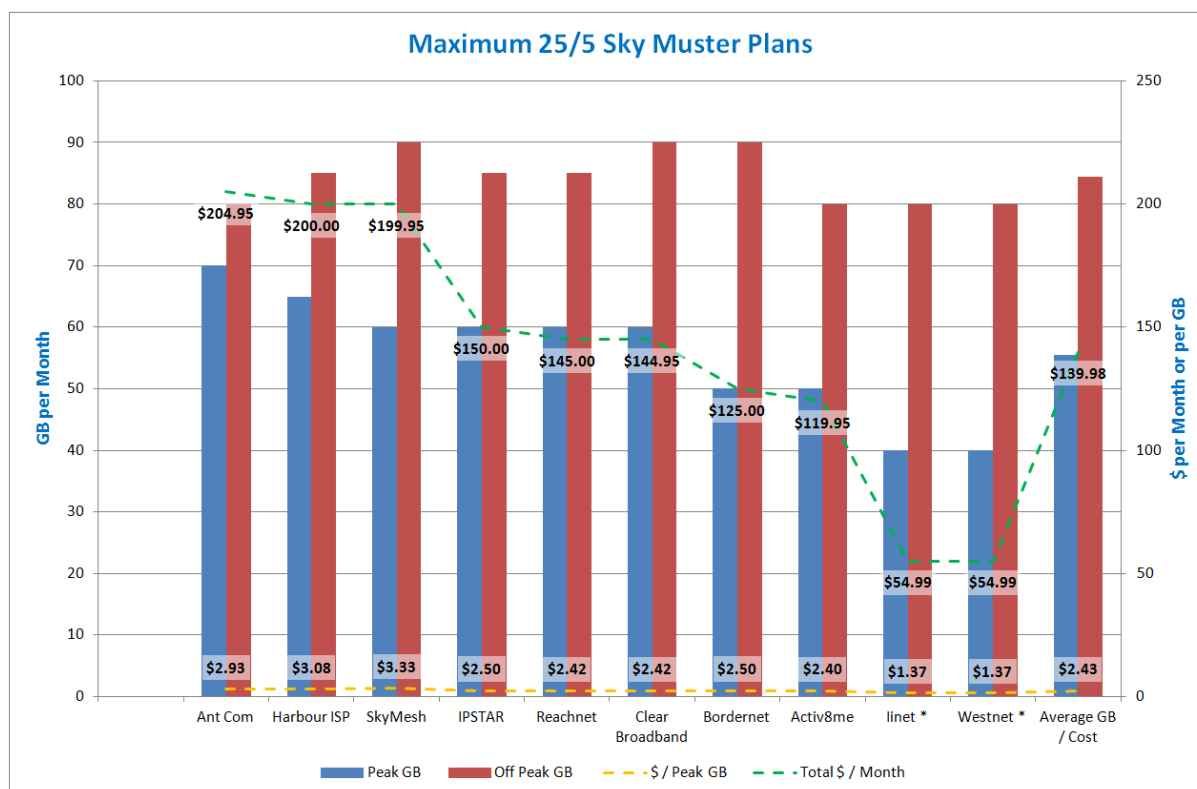


Figure 22 Maximum data offered versus cost, for each of the current Sky Muster providers, BIRRR 2017

The customer will be completely unaware of any of these possibilities; until the service suddenly stops.

The majority of Sky Muster providers include a disclaimer that Sky Muster VoIP does not work when shaped.

It is clear that routing of VoIP via the intended Traffic Class 1, is not always implemented by the Voice Service Provider and most customers have no idea of this important service consideration. If VoIP traffic is not being routed via TC-1 over Sky Muster and just as importantly, within the provider's network, the VoIP service will be unusable when shaped and during times of network congestion.

It should be noted that all VoIP equipment (VoIP capable router etc) are owned and maintained by the customer. The customer equipment is not serviced by nbn™ or the provider. The provider will in most circumstances, assist the customer to troubleshoot a faulty VoIP service. To undertake service fault finding, the customer **must maintain an alternative phone service to jointly fault find the VoIP service** with the provider. A catch 22.

### How much bandwidth is required and how much internet data will VoIP consume?

VoIP data counts against the customer's internet data quota (up and down). The bandwidth required to make a VoIP call is dependent on the audio codec stipulated by the provider and the capability of the customer's equipment.

The most common codec used by VoIP providers in Australia is G.711a. A G.711a VoIP call requires 87.2 Kbps for the receive path and 87.2 Kbps for the transmit path. The 150Kbps Sky Muster™ TC-1 channel can support one G.711a voice call. This codec consumes ~80MB total data per hour during an active call.

G.729 is an alternate lower quality codec which may be deployed. G.729 consumes just over 13MB per hour receive and 13MB per hour transmit, or about 27MB of two-way data per hour during a call. A VoIP call using G.729 requires 31.2 Kbps for the receive path and 31.2 Kbps for the transmit path. The 150Kbps Sky Muster™ TC-1 channel may support multiple simultaneous G.729 voice calls. However due to the lower voice quality and its inability to support additional voice band services, it is rarely used by nbn™ VoIP providers.

**Given that most RRR customers are running a business from home and/or utilizing distance education daily, usage of 2 hours telephone or more is very conservative. Even at this level it would consume between 780mb and 4.800GB per month, a considerable percentage of available peak data.**

## 5.5 Latency

Latency is the measure of the time taken for a signal to travel from place A to place B and return.

Any replacements of the USO voice services should demonstrate a comparable level of quality regarding latency and voice quality to existing telephone services. nbn™ Sky Muster has a latency minimum of 550 to 650ms due to the geo-stationary orbit of the satellite. This causes an audible delay, which affects the quality of a voice.

*“Because of the nature of geostationary satellite communications, there is a small but noticeable lag or latency, when communicating via Sky Muster to another satellite service, compared to the TUSO standard telephone service”*

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Many nbn™ Sky Muster customers are in areas where there is no mobile service and the closest mobile coverage is a significant distance away. In these areas the majority of phone calls being made are to neighbours and local businesses. **If both parties were forced to use VoIP over Sky Muster then the latency is doubled and is in the order of 1.2 to 1.4 seconds; which is unacceptable.**

## ITU G.114

G.114 is the ITU recommendation that addresses the acceptable delay for a voice communication between two parties.

ITU G.114 is oriented to national telecommunications. A key recommendation of G114 relates to acceptable mouth to ear speech delay. ‘Mouth to Ear’ is the measurement of the time taken for an emitted sound to reach a receiver’s ear. It recommends that delays of less than 150 milliseconds are acceptable, whilst **delays that exceed 400 milliseconds are unacceptable.**

When a conversation is conducted between two people over a path where the mouth to ear delay is between 150 milliseconds and 400 milliseconds ITU G.114 recommends that the two voice calling parties should be made aware of delay quality issues.

**Figure 22** identifies typical mouth to ear delays in the Australian network.

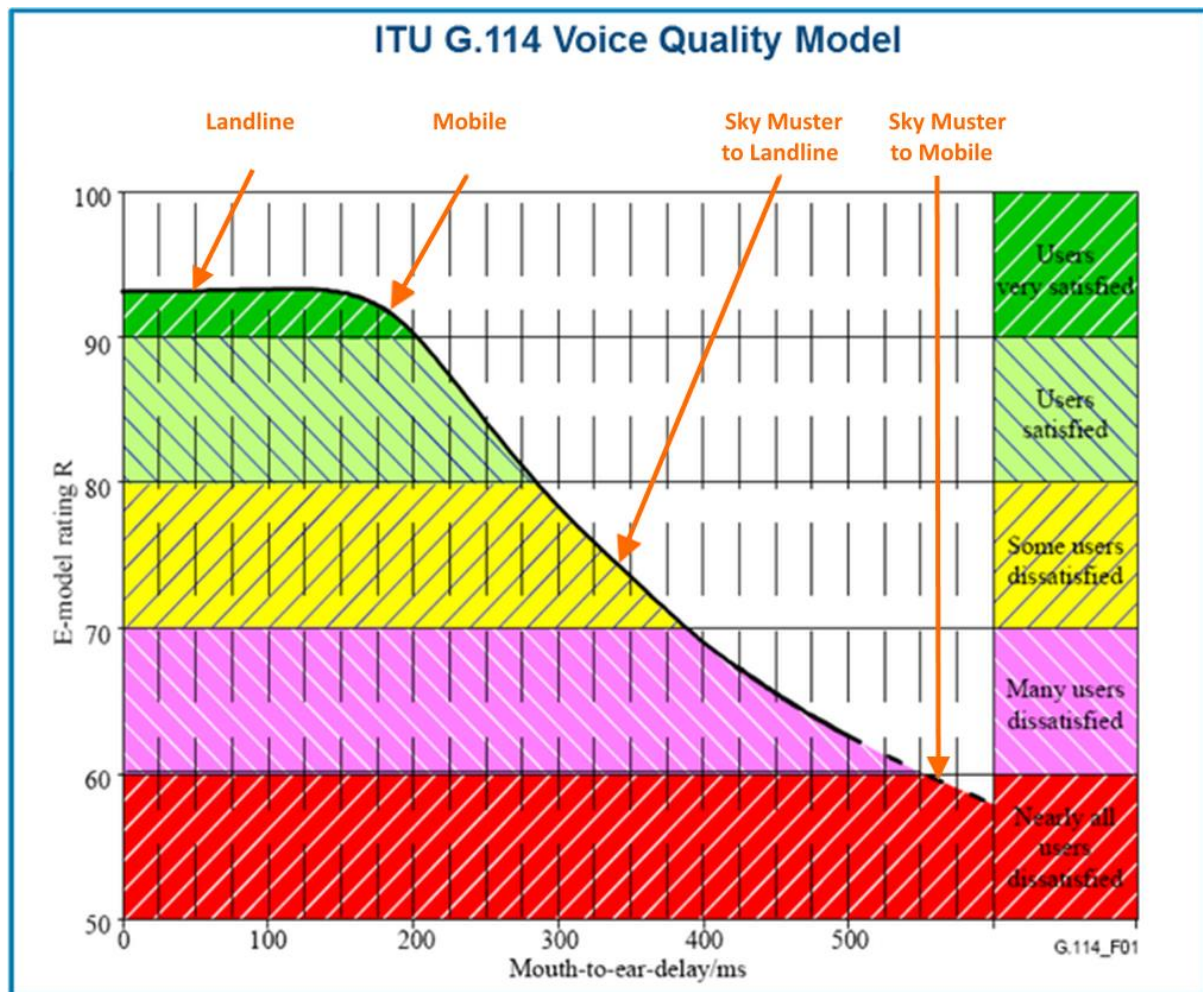


Figure 23 ITU G.114 - Speech Quality versus Latency

The mouth to ear delay for a typical Sky Muster voice connection to a fixed line customer in Australia is 300 to 400 milliseconds.

The mouth to ear delay for a call from a Sky muster customer to a mobile customer may be up to 150ms longer, with customers experiencing mouth to ear delays of 450 to 650 milliseconds.

The mouth to ear delays for a call from a Sky muster customer to another Sky Muster customer is doubled, with customers experiencing mouth to ear delays of 600 to 800 milliseconds. This magnitude of delay is beyond anything imagined by ITU G.114 for a national network call and is clearly unacceptable.



It is clear from G.114<sup>1</sup> that the expectation of national calling customers is for a delay of less than 150ms. Voice calls placed over Sky Muster will experience a range of customer voice quality problems, which can be accurately identified from G.114.

The Sky Muster call quality experience will range from *'some customer dissatisfaction'* to *'total customer dissatisfaction'*.

A carrier grade voice link, between the Local Exchange and the customer premises must have a latency of less than 5 ms (preferably less than 3 ms) such that the total effect of end-to-end delay is minimised for Telephony and for (near future) High Definition (HD), multi Camera/Display Video Conferencing.

nbn<sup>TM</sup> state that Sky Muster satellite has :

“specific characteristics and limitations. The main limitation of satellite services is the time that it takes the data to get to and from the satellites (latency). This means that some real time services, like online gaming, are affected by latency. Some people who work from home using Virtual Private Network (VPN) secured connections from their home to their office may also experience issues.”

nbnco 2016

## 5.6 Jitter

Jitter describes the effects of network delays on packets arriving at the receiver. Packets transmitted at equal intervals from the transmitting gateway arrive at the receiving gateway at irregular intervals due to variable latency in the traffic path. Excessive jitter (excessive variation in latency) has the effect of making speech choppy and difficult to understand. Jitter is calculated based on the inter-arrival time of successive packets. For high-quality voice, the average inter-arrival time at the receiver should be nearly equal to the inter-packet gaps at the transmitter and the standard deviation should be low.

Jitter of less than 100ms is considered acceptable for good quality VoIP communication. Sky Muster may provide a jitter lower than 100ms, however it often exceeds this threshold, compromising the voice experience.

Some customer VoIP equipment may include a 'jitter buffer' where up to 100ms of network jitter is 'removed'. This helps maintain adequate VoIP voice quality when modest jitter is present. Once jitter exceeds 100ms, words in a conversation start to clip and distort, as the jitter buffer can no longer compensate. The inclusion of a 100ms jitter buffer adds a further 100ms of voice delay to the conversation. For Sky Muster this is not desirable.

See **Appendix G** for a Sky Muster users report on jitter levels.

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<sup>1</sup> Note: G.114 only measures the effect of mouth to ear delay (or latency) on voice quality. There are other path defects, which include path jitter and packet loss, which impose an additive impact on voice quality.

## 5.7 Packet Loss

Packet loss or packet corruption causes degradation of voice quality on Sky Muster. Since VoIP is User Datagram Protocol (UDP)/ IP it is not retransmitted (as in the case of TCP/IP). The packets cannot be recovered if the packet becomes lost or corrupted. It is extremely important to have very low Bit Error Rates (BER) to ensure no corruption or loss. This is a critically important difference between VoIP and other digitised voice communications e.g. via the PSTN.

Packet switched networks are subject to congestion as typical data traffic is bursty. Congested networks wreak havoc on a VoIP call quality due to delayed, dropped, or packets that are out of sequence. It is a necessity to have QoS and Prioritization in order to guarantee delivery of VoIP traffic through congested links. Many Sky Muster users have observed lengthy periods of high packet loss. If any packet loss impacts the nbn<sup>TM</sup> network TC-1 capacity, voice communication is **not possible**.

If Sky Muster and fixed wireless customers are forced to use VOIP, retail providers must ensure that data packages, reliability and voice quality are sufficient to provide a comparable level of service at a comparable price to that which is available using standard telephones. The noteworthy limitations on the suitability of nbn<sup>TM</sup> Sky Muster VoIP for voice calls must be considered, to ensure businesses, students and consumers have access to reliable and guaranteed voice services that meet their needs and are not inferior to current TUSO requirements.

## 5.8 Non Managed VoIP - WiFi Calling

Voice over WIFI (VoWiFi) or WIFI calling is currently being rolled out by each of the mobile providers. Optus lead the pack with their smart phone App version, followed by the Telstra T-Voice App. These Apps turn any compatible smartphone or tablet into a home phone mobile handset. Optus and Telstra are now concentrating on VoLTE capable handsets to support this service. VoLTE stands for Voice over Long Term Evolution and is only supported by a selection of new 4G capable handsets.

If a customer has a home internet connection that supports a WIFI signal, a VoLTE handset will automatically roam to the WIFI network and your VoLTE smartphone will continue to take and make calls without any intervention from the operator.

The mobile works due to the internet provided by the nbn<sup>TM</sup> internet service or other internet or WIFI, albeit with satellite delay and voice quality problems, if you are on Sky Muster.

The major concern with VoWiFi is the false sense of security it gives consumers. As already established in this submission Sky Muster has poor reliability. Furthermore WIFI calling uses a proprietary voice protocol and is routed TC-4 (best effort) over your nbn<sup>TM</sup> service or other internet service and not over the specially provided nbn<sup>TM</sup> TC-1 high priority service allocation, reserved for managed VoIP.

VoLTE is an example of 'Over-the-Top VoIP' or OTT. OTT is carried by the internet on a best

efforts basis by third parties. It is in the same category as Skype and Apple FaceTime and many other OTT products, which are also carried over the internet by best effort. WIFI calling is directly impacted by the reliability and QoS of the Sky Muster or internet service. The customer will be lulled into a false sense of security by WIFI calling when suddenly, for no apparent reason and when they most need it, it won't work, or it will work so poorly as to render voice unintelligible.

## 6. AFFORDABILITY

*affordability* — the purchase of the service does not place undue hardship on people, particularly those in low-income and other disadvantaged groups.

The TUSO draft report acknowledges two key issues with regard to affordability:

- *The existence of the NBN means that the objective of universal service can be reframed to provide a baseline (or minimum) broadband service to all premises in Australia, having regard to its accessibility and affordability, once NBN infrastructure is fully rolled out. This encapsulates access to both the internet and voice services as the internet will increasingly be the medium for voice communication.*
- *To the extent that there are any remaining availability, accessibility or affordability gaps once the NBN rollout is complete, current trends and existing policy settings suggest that these are likely to be small and concentrated, and amenable to specific social programs rather than large scale government interventions such as the TUSO.*

The National Rural Health Alliance Inc in a submission to the Productivity Commission Inquiry into Telecommunications Universal Service Obligation states:

“Affordability of telecommunication services is a significant issue for people living outside the major cities. People living outside Australia’s capital cities in 2011-12 earned only 85% the amount that their capital cities counterparts earned. Further, the percentage of employed people earning \$15,600 or less is 15% higher outside capital cities, while the percentage of employed people earning \$78,000 or over is 26% lower outside capital cities. While 23% of people living in major cities carry some sort of health card, 29% of people living outside major cities carry some sort of health card. Concession card-holders are almost 30% more prevalent in rural/remote areas compared with major cities. This higher prevalence is particularly evident in regional areas (30%), compared with remote areas (about 23% - the same as in major cities). These data are relevant in considering how access to telecommunications – mobile and fixed line services and the internet – can bridge the telecommunication inequality divide that affects people living outside Australia’s major cities.

Generally, there are greater vulnerabilities and challenges facing people living in rural and remote Australia. Poor access to adequate and affordable digital services will only serve to deepen these vulnerabilities and challenges.”

NRHA 2017

There are 412,000 residences mapped for nbn™ Sky muster services, nbn™ estimate that only 250,000 will sign up to the service. One of the main reasons for this is affordability and data limits.

As shown in **Figure 21**, nbn™ Sky Muster Fair Use Policy (FUP) limits providers to sell a maximum amount of peak data of 70GB at a cost of \$204.95 for 25/5 speed. Note however that a 40GB plan from the same provider costs just \$49.99, or \$1.24/GB. The additional 30GB costs \$155 or \$5.15 per GB.

On average nbn™ Sky Muster (across all providers) provides peak data limits of 55.5GB for \$135/mth

*“nbn™ will have a capped national wholesale price Australia-wide”* USO Draft report

Due to the nbn™ Sky Muster FUP this capped wholesale price does not translate to equitable pricing for end users on Sky Muster. Sky Muster providers have had to price higher GB plans to be unaffordable to discourage people from signing up to these, because the penalties the RSPs are charged are very high (*the Adjustment Fee nbn™ charge RSPs for going over their average allowance can be up to \$61,600 per month for every month they are over for each 4,000 customers.*)

(Whirlpool, 2016)

USO Draft report states

*“telecommunications services are becoming more affordable — thus lowering the cost of economic and social transactions — with benefits to individuals, businesses and government. The price of telecommunications services has fallen substantially over the past decade — both in absolute terms and relative to other essential services. Over that time, quality has also continued to improve. Unlimited voice calling and messaging are now standard inclusions in many mobile phone plans, while data allowances and speeds continue to increase.”*

Telecommunications for RRR consumers are not becoming more affordable. Sky Muster satellite does not offer the consumer an equitable or affordable service when compared to premises connected to the nbn™ Fixed line and Fixed Wireless services, as demonstrated in **Figure 23**.

Type of Service	Example RSP Plan	Download Limit (Gb/Month)			Maximum Speed (Mbps)		Price (\$/month)
		Total	Peak	Off peak	Down	Up	Unbundled
Satellite (LTSS)	Activ8me	130	50	80	12	1	\$114.95
4G Mobile Broadband	Telstra	50	50	-	2-50	1-10	\$150.00
4G Mobile Broadband	Optus Home Wireless	200	200	-	up to 12	1	\$80.00
NBN Fixed Wireless	SkyMesh	180	60	120	12	1	\$49.95
NBN Fixed Line	iiNet	Unlimited			12	1	\$69.99
ADSL+2	TPG	Unlimited			up to 20	1	\$59.99
Landline Only	Telstra Home phone						\$25.95

Source: Compiled from publicly available information

Figure 24 Sky Muster plans compared to other internet data plans

#### BIRRR CASE STUDY 5

Gladys is an 80 year old widow that still lives alone at home in Condamine, QLD. She has no interest in those 'newfangled' gadgets and doesn't want a broadband connection. Gladys does have a landline phone connection through Telstra for \$25.95 per month plus calls.

Gladys will be moving to a new place on her son's property that will have NO landline and no MOBILE coverage. Her son lives in an area that has nbn™ Fixed Wireless being rolled out. Gladys will be able to get one of those new fangled devices and her voice communications will be through this gadget.

Example of costs:

Gladys has no need for internet access. She wishes to stay with Telstra and lowest cost Telstra nbn™ phone Plan is the 'Home Phone Local on the NBN'.

This will cost her \$40 per month plus calls on a 24month contract. Pensioner discounts may apply.

For Gladys, nbn™ fixed wireless or Sky Muster services will cost considerably more than her current TUSO service. Condamine also experiences numerous power outages and Gladys would not have a phone service if this were to occur.

Sky Muster users are also falling way behind other nbn™ users in how much data they can download in a month because the nbn™ FUP restricts RSPs from increasing their plans data allowances.

Holders of a valid healthcare or pensioner's card can currently access a Telstra home phone essential plan for \$25 a month, Telstra VoIP only on nbn™ (no broadband) Fixed Wireless and Fibre is also \$25.95. Yet there is disparity with nbn™ Sky Muster services where VoIP is only offered as an add-on to a broadband plan. The minimum a Sky Muster user would have to pay to have a voice connection is \$34/mth for the minimum broadband plan and another \$10/mth (plus call costs) for the VoIP plan. A total of \$44 a mth for those consumers who only require a landline service. See **Appendix I** (NB: Not all Sky Muster RSPs offer VOIP).

The NRHA in a submission to the PC Inquiry into the TUSO states:

“They also look at the way in which people in remote communities access telecommunication, noting that **pre-paid services are the main source of access**. They also note that charges are significantly higher in these communities, resulting in lower levels of access.”

(NRHA 2017)

The ability to access the nbn™ network using the pre-paid option is not available, further increasing the risk that these remote communities will not be able to afford to use the network.

**Currently 1.3 million households do not have internet access at home**, more often these people are disadvantaged, elderly, or low income families. The Australian Bureau of Statistics (ABS) estimates that for the disabled and elderly, this figure increases to 38% and 46% respectively (ABS, 2016).

**Sky Muster is not an affordable service for many Australians and is a costly alternative to traditional USO services for RRR consumers, effectively leaving many on low incomes with no communication service.**

## 7. BACK UP SERVICES

*“Of the 400 000 premises within the nbn™ satellite footprint, at least 310 000 premises are estimated to be able to use their mobile phones, thus providing a low-latency alternative to the nbn™ satellite service. There are thus up to 90 000 premises in the nbn™ satellite footprint that do not have mobile phone coverage. In the absence of the TUSO, they would receive a higher latency voice service compared to other technology platforms (copper, fixed wireless, fibre and mobile).”*

P 12 USO DRAFT REPORT

For those consumers who only have access to nbn™ Sky Muster it is essential that current USO guarantees are maintained. **In the event of an emergency a non-working Sky Muster service would leave many RRR residences with no form of communication.** Not only is this extremely dangerous but it also results in these residences having no way to troubleshoot their connection, educate their children or run their business.



#### BIRRR CASE STUDY 6

Tiani lives on Suplejack Station in the NT. It is one of Australia's most isolated cattle properties, 730km to Alice Springs or Katherine, 1000km from Darwin. There is no mobile service for hundreds of kilometres and no neighbours within two-way radio distance. Their TCRN landline is a lifeline to their property. During 2016 Tiani had periods of up to 6 weeks with no working landline. During this outage Tiani's daughter had a serious accident when she fell from her horse. Ironically she was saved on her satellite service & her only way of contacting the Flying Doctor was via a Facebook message to a friend who was able to phone in the details. This scenario was potentially fatal, directly due to lack of dependable communication and a deliberately shaped nbn™ provided internet service.

**The PC need to reflect on the treacherous situations they are placing Australians in if they reject the USO for RRR consumers.**

BIRRR believes the number of nbn™ Sky Muster mapped residences that do not have access to mobile coverage to be much higher than the PC report of 90,000. These figures also do not reflect the number of nbn™ Sky Muster connections that are multi use. A sole internet connection in RRR areas is much more than a home internet/voice service, it is used for operating businesses, volunteer work, educating children, tele-health appointments, further education, research and marketing. It is an essential service due to geographical isolation making banking, education, business operation, socialization and the many components of rural living **IMPOSSIBLE** to conduct during periods of no service.

The PC figures of 90,000 also do not take into account the patchy mobile coverage and inability of end users to make a voice call from inside their home. When estimating numbers in the satellite footprint who do not have mobile service the PC **MUST** consider including the large number of residences and businesses who have never had an internet connection previously and may never want one but still require a telephone service. As well as those whose mobile signal has declined over time and those using other forms of satellite internet such as Telstra and Optus services. A simple tally of ISS customers and Australian Broadband Guarantee (ABG) customers does not effectively cover Sky Muster users who have no mobile reception. By excluding those mentioned above the PC has also excluded many remote schools and government services who are contracted to alternate satellite internet. If these specific users were not connected to Sky Muster and the USO is removed they would have no guaranteed landline and no mobile coverage.

Just over 42% of BIRRR Sky Muster survey respondents state they have no alternate internet coverage (**i.e. no mobile service**), see **Figure 24**. Making the PC estimated figure of 90,000 (based on ABS 2015, Household and Family projections, Australia, 2011 – 2036) much lower than BIRRR survey figures.

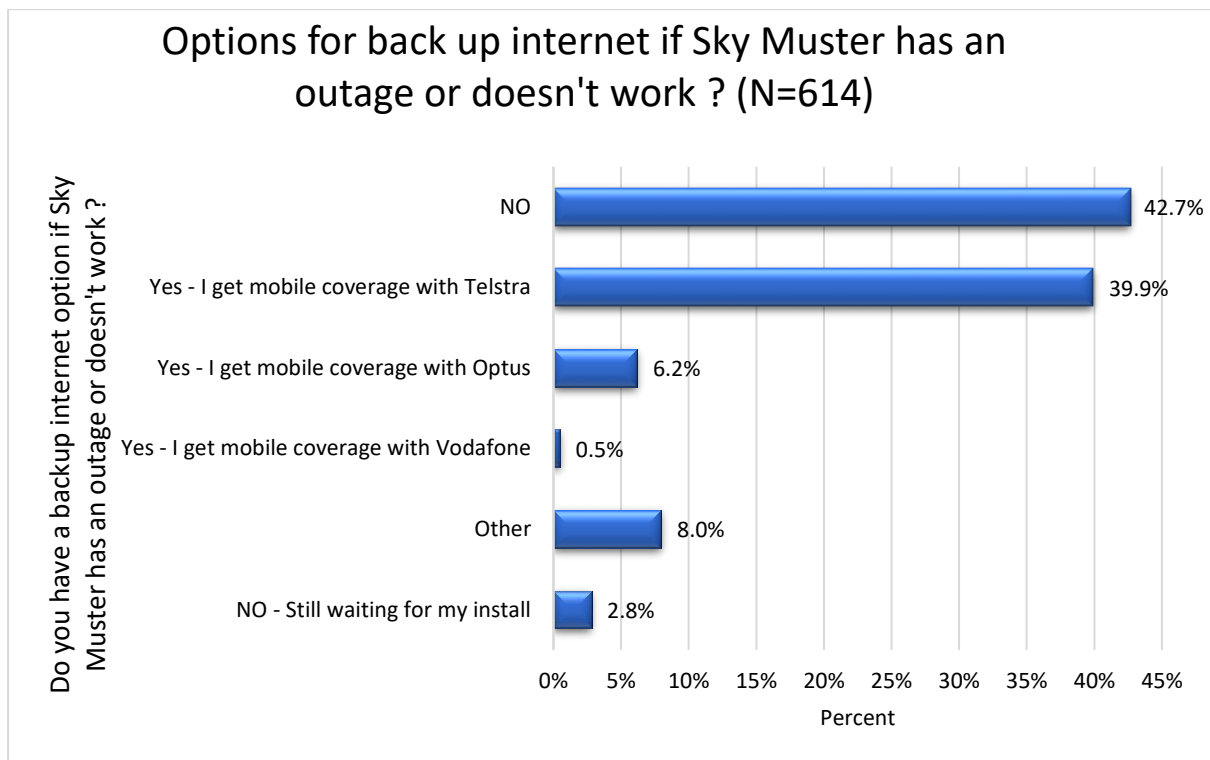


Figure 25 Percentage of BIRRR Survey respondents who have / don't have mobile coverage

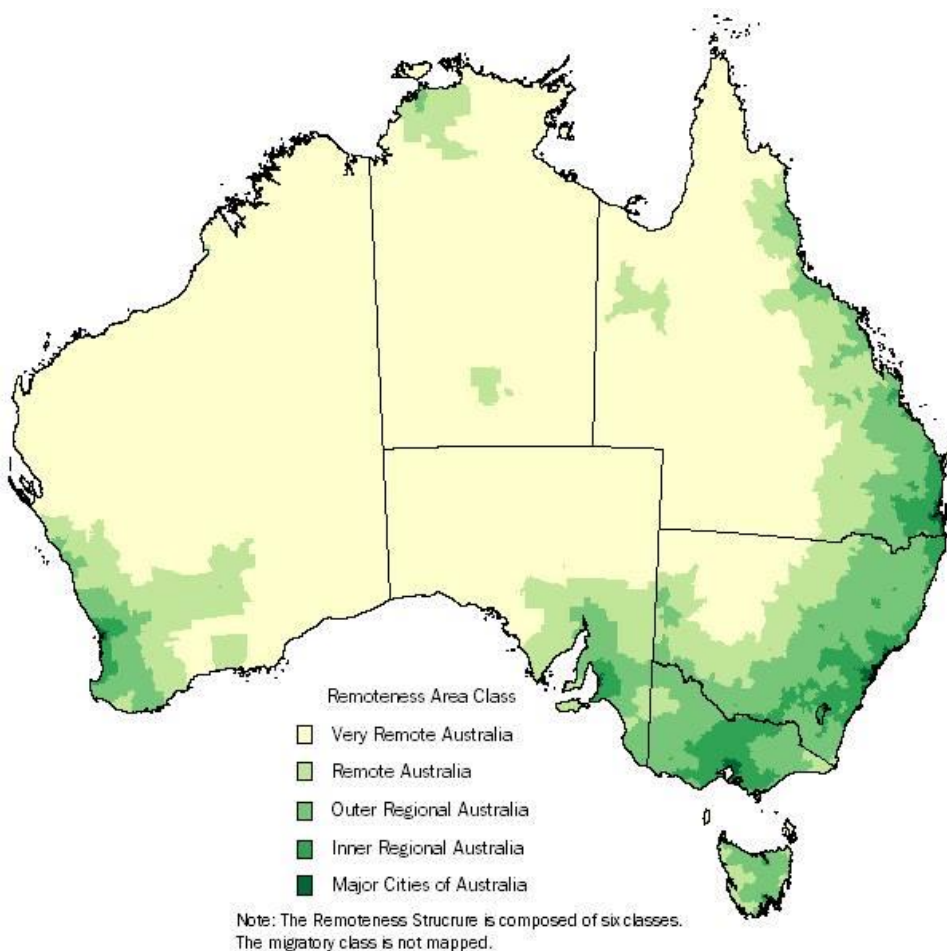


Figure 26 ABS Remoteness Structure Map 2014 – 2015

ABS Statistics show that (in 2014–15) there were 1.3 million Australian households **without internet** access at home (14%), and that households located in Australia’s major cities are more likely to have internet access at home (88%) than those in remote or very remote parts of Australia (79%).

The main reasons given for not accessing the internet at home were:

- no need (63%)
- lack of confidence or knowledge (22%)
- cost (16%).

While 97% households with children aged under 15 years (across ALL demographics) had internet access, while those without were measured at 82%.

The most COMMON reason given for not accessing the internet was cost (43%). For households without children under 15 years, the main reason given for not accessing the internet was having no need for access (64%). **Having no need for access to the internet** at home was also the main reason given by both households in major cities (61%) and households in remote or very remote Australia (50%).

It is also wrong to assume that all Australian households who can’t receive mobile service have internet access of some kind, and are therefore able to access an alternative to their landline telephones.

	Households without internet access	Households without internet access
Remoteness area	'000	%
Major Cities	738.7	11.9
Inner Regional	291.2	17.5
Outer Regional	190.9	20.7
Remote or Very Remote	29.4	21.5

Figure 27 Number of Households without Internet Access 2014-2015 ABS

In total 136,600 households in remote and very remote areas still do not have internet services installed (ABS, 2015). Some of these residences may be used for caretakers and itinerant workers, some may be only accessible at specific times of the year and others (up to 50%) have no requirement for internet. As such the removal of the current USO landline services would leave these residences with no communication method.

Based on 412,000 eligible nbn™, Sky Muster premises (source: nbn™, January 2016) and BIRRR Survey results (42% with no mobile coverage), this equates to over **175,000** residences (who have internet connected) for **whom mobile service is not available**. Furthermore **57,000** (ABS, 2015) residences in areas without mobile reception may have NO internet connected. Many of these are not only residences, they are also the communication point for businesses, community buildings, health and educational facilities, servicing a large number of RRR residents & tourists (who have not been included in

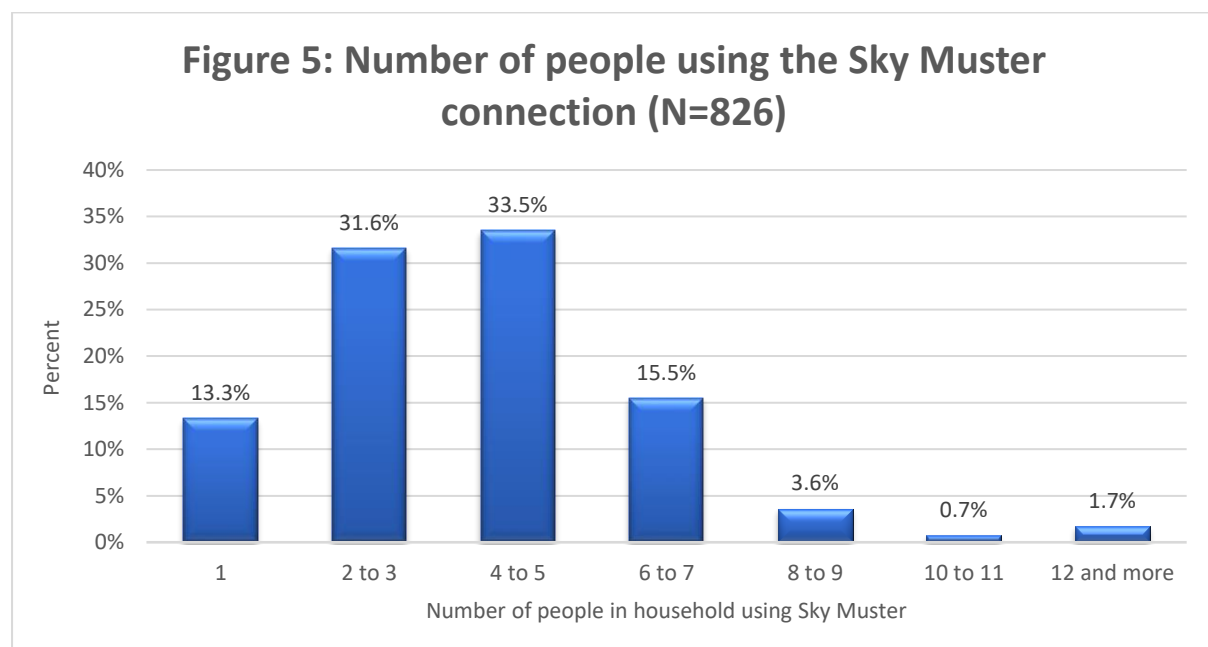
numbers affected). Resulting in a total number of **232,000** Sky Muster mapped residences that could be without mobile service, which is more than double the estimated PC figure and does not include those mentioned above.

Approximately **3.842** people per residence in RRR areas use a Sky Muster Connection (**Figure 27**, BIRRR, 2017).

**232,000** households with no mobile service each with **3.842** residents per household = **891,344** people in RRR area who potentially cannot access mobile service.

Note: This calculation excludes those on Telstra or Optus satellites, businesses, mobile travellers, those with no fixed address and community facilities in RRR areas.

BIRRR predicts from the above estimates that this will affect approximately **900,000** people living in remote areas.



*Figure 28 3.842 people per Sky Muster Connection BIRRR Sky Muster Survey 2017*

For areas without mobile phone coverage it is essential that standard telephone services are maintained.

### MISTAKE CREEK SCHOOL CASE STUDY

Mistake Creek State School is located 62 kilometres from Clermont in Central Western Queensland. It was opened in 1983 as a standalone school to service the local grazing families of the area, with students travelling up to 100 kilometres to access the facilities. Today the school has 15 students, ranging from Prep to Year six, is the site for an e-kindy hub and also provides a location for numerous community events in the Mistake Creek area and meeting place for the Mistake Creek Progress Association. The school currently has a full time teacher in residence as well as a second teacher residing at the school for three days per week. The school is located on a dangerous gravel road that has a history of numerous accidents and is a highly frequented, narrow inland highway used by road trains, cattle trucks, the school bus, locals and tourists alike. **The school bus run does not have access to mobile coverage for the entire length of its journey.**

The school's isolated location means it has limited mobile phone and internet connectivity. Mobile phone coverage is only available within a short vicinity of the school with the use of a Yagi antenna and 3G booster (supplied by the local community). This coverage is at best intermittent and unviable for extensive use. The school is also serviced by an Education Department supplied Optus satellite, which is not always a reliable system. This means that currently the only consistently reliable means of communication for the school is the POTS. Currently the internet access for the students is unsatisfactory and has a detrimental effect on their education.

Given the inadequacy and unreliability of the other technology available at the school if the landline was unable to be accessed, the school and its residents could, realistically be left without any means of communication.

Mobile coverage maps are very patchy and often do not equate to on the ground signal, **70% of Australia's landmass has no mobile coverage** (RTIRC, 2015). This includes numerous small communities, many remote properties and mining camps, and large stretches of highways frequented by tourists and transport services. To achieve mobile signal in many RRR locations consumers need to spend thousands of dollars on antennas and boosters. BIRRR survey of RRR residents in 2016 illustrated that 72% of mobile broadband users had to purchase extra equipment at their own cost, usually between \$1000 - \$2000 (BIRRR, 2016 Fig 20, p35) to establish a mobile connection. Often the equipment becomes dated very quickly and needs replacing and due to a lack of available technicians in RRR areas, consumers are forced to install and maintain mobile boosters and antennas themselves.

The growing number of illegal boosters is also having a significant impact on mobile signal strength in an increasing number of bush communities. In the past two years ACMA has received reports of almost 300 illegal boosters. These have a negative impact on many businesses and residences, yet despite large fines being in place ACMA have only prosecuted one case (MCF, 2015).

**L (BIRRR Member)** I'm very worried that people like myself that live in an area with poor mobile reception are being overlooked/disregarded in this inquiry's scope - as "technically" we do have coverage - even though it's sh\*t coverage.

We only have one bar outside our house on the mobile if we are lucky, and various areas on the farm where we can't get signal. There is no mobile reception inside just using the handset - we only have service with a cel-fi booster and Yagi, which is no good in a blackout. So basically if our landline is taken off us we have no option to place an emergency call from our residence in a blackout.

**Kylie Stretton (BIRRR Admin)** We are livestock agents running our business from our farm. We unfortunately have to rely on one service as it is, and that service can be dodgy. Our landline is NGWL, which of course runs through 3G. So when the mobile service goes down or is unreliable, which we are seeing happen on an increasing basis we lose all communication with the outside world and our business (both farm and agency suffers). We have to keep driving until we find service to make any sort of contact with clients, which is extremely detrimental to our business given the number of agents in our area. Having any sort of lag or having to say over, given the sheer amount of times spent on the phone will just be a nightmare, given that most of our clients would also be on the same system! I have experienced what it is like to have my voice and broadband service operating from the same equipment/technology, under no USO guarantee. I would caution the PC to recommend any service that puts a RRR consumers eggs all in one unreliable basket.

**Sue (BIRRR MEMBER):** Landline has to be made available for those tiny percent of the population that have absolutely no mobile reception cause when there is a satellite issue there is absolutely no communication tool for emergencies. This is a step back into the dark ages. Compared to urban customer who have VoIP over their nbn™.....if there is a problem with their nbn™ service and they can't use VoIP then at least they have a mobile service. My landline is and has always been my emergency service.

**BIRRR MEMBER:** Not to mention that so far Sky Muster has not proven reliable enough to be capable of providing a replacement for POTS... what is a customer to do when their Sky Muster service is down? Drive into town and make a mobile call only to be told to return to the NTD to perform a series of tests after which another drive into town followed (after several loops of the above) a technicians appointment will be made and then likely cancelled/missed because the technician got lost and couldn't contact the customer?!

It is extremely difficult to report outages on mobile networks in RRR areas, international call centres often have no understanding of the urgency of repairs required and fault finding can take many months. Consumers are expected to be experts in IT to troubleshoot their own connections. Telecommunications in RRR areas is a confusing jungle of opportunities and obstacles, with very limited support and customer service.



#### SAM BIRRR CASE STUDY 11 - 12

Sam lives in the Riverina area, at Conargo NSW. Over the past few years he has had numerous issues with his local Telstra tower, to date these issues have not been resolved. Sam runs a large broadacre cropping business across several properties, employing a large number of staff. His service level has declined and he now experiences outages, dropouts and a very unreliable connection. Efforts in reporting faults have required Sam to co-ordinate other farmers in his area to 'prove' there are issues. When Sam's tower has a fault, remote watering points fail, precision ag equipment cannot be used and crucial business opportunities are missed. Sam has lost peak grain price contracts on numerous occasions. He would like to be more innovative, including using apps to manage staff delivering grain to the silos, however as his connection is not reliable and his data is limited this is currently unachievable.

**BIRRR CASE STUDY Ardlethan:** Ardlethan in NSW had 5 outages of up to three days during 2016. One outage occurred during harvest, a crucial time for businesses to communicate with grain buyers. Mobile connectivity is also required as a safety tool to inform of accidents and fires, commonly caused by machinery during harvest periods.

<http://www.abc.net.au/news/2017-01-12/regional-residents-summon-telstra-to-explain-repeated-outages/8177570>

Mobile networks in RRR areas are becoming exceedingly unreliable. Old equipment, lack of technicians, customer expenses, poor customer service, huge provider wait times, illegal repeaters and delayed mobile blackspot roll outs have all contributed to this unreliability.

**The PC should not consider RRR mobile connectivity as a replacement for USO landline services, until this connectivity can meet the same guarantees of service as existing arrangements.**

It should be noted that NGWL services are not currently covered under existing USO agreements.

*"The service is not the equivalent of a standard Telstra fixed line service and is not supplied by us in fulfilment of our Universal Service Obligation. The Customer Service Guarantee Standard does not apply to the Service."*

<https://www.telstra.com.au/content/dam/tcom/personal/consumer-advice/pdf/consumer/wirelesslink.pdf> p.3

If services such as NGWL are to be considered as baseline voice services there needs to be assurances that repair time frames and QoS will be met.

Unfortunately there are plenty of examples where existing USO services have not been working (for any number of reasons including faults and storm damage). In some cases, this may have contributed to the death of individuals. Backup options (such as mobile phones) were either also not working, or working intermittently due to location, topography, geography etc. As a result of these outages and problems with using alternative options, Emergency Services were not able to be contacted in a timely manner.

If these issues can arise with the USO on existing POTS, it can only be exacerbated if the USO was switched to nbn™ Sky Muster and fixed wireless services which have less reliability (due to the inherent connectivity issues these platforms have).

**Fay Craigie**, aged 75 from Proserpine QLD died in 2013 during the Australia Day long weekend telecommunications breakdown that rendered her home phone and alert button useless. <http://www.dailymercury.com.au/news/womans-death-leads-to-calls-for-000-probe/1745983/>

**Trevor McClune**, Boyne Valley died in a timber cutting accident but what shook the community was that Trevor's calls for medical help went unanswered because he had no phone coverage. <http://www.gladstoneobserver.com.au/news/the-valley-people-wont/3064930/>

**Sam Boulding**, aged 10 died from an asthma attack in 2003. Telstra failed to provide a reliable phone service to the boy's family in the days before his death resulting in his stepfather having to run next door to alert emergency services.  
[www.abc.net.au/news/2003-07-09/coroner-clears-telstra-over-boys-death/1883118](http://www.abc.net.au/news/2003-07-09/coroner-clears-telstra-over-boys-death/1883118)

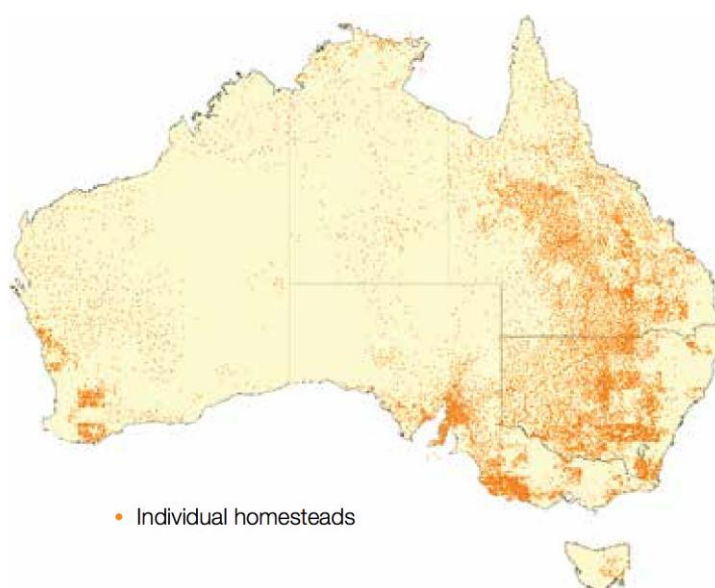
**Graham Lamb**, 57 from Duckinwilla had no landline for over two weeks in 2014 when he had a cardiac arrest. His family was devastated by the delay in the arrival of the ambulance, which was compounded by the problems in receiving advice from emergency services via their unreliable mobile phone service. Graham died whilst waiting for the ambulance.  
[www.frasercoastchronicle.com.au/news/man-dies-as-call-to-000-cuts-out-man-dies-as-000-c/2444325/](http://www.frasercoastchronicle.com.au/news/man-dies-as-call-to-000-cuts-out-man-dies-as-000-c/2444325/)

If reliable fixed voice services are not guaranteed for RRR Australians, stories like those above will become more prevalent.

## 8. ACCESSIBILITY

VoIP over nbn™ Sky Muster and fixed wireless has several limitations for specific groups of end users such as priority assist consumers (up to 187,000), people with disabilities (including 5000 to 10 000 users of the National Relay Service), indigenous communities (around 142,000), medical alarm end users, distance education students, tele-health users and RRR businesses. Many RRR emergency services, health clinics, hospitals, schools and tele-health facilities will also be using Sky Muster as their nbn™ option. The BIRRR team does not believe that Sky Muster can perform adequately to ensure reliable communications for essential services.

**Figure 4: Homesteads**



Source: Diagram produced for the Committee by Anthony Goonan (Yless4U) using publicly available data

*Figure 29 Individual homesteads, Australia, RTIRC, 2015*

Australian's living and working in regional and remote areas provide a valuable contribution to the national economy, and they do so in some of the most inhospitable conditions found in any nation. Australians in regional and remote areas do so without the ready access to essential services enjoyed by those living in urban communities. It is unthinkable in a social democracy that the myopic views of the selfish should be entertained by a parliament that is meant to represent everyone.

Increased participation and universal access to broadband based data and voice services will ensure that Australia's participation in the global digital economy increases and at the same time the nation will benefit by ensuring that no-one is disadvantaged.

*Gregory, M Innovation Australia, Dec. 2016*

## 8.1 Medical & Special needs

There is no medical priority offered for Sky Muster services and at this stage no quarantined data allowance for tele-health services or distance education tertiary students (equivalent to the educational port for primary and secondary distance education students).

"If you use medical alarms, faxes or are priority assistance then you will not be able to use Sky Muster for these services and should continue to use your current service. Can I get priority assistance services? No. Sky Muster does not offer priority assistance services. You will need to continue to use your current voice services to access priority assistance."

*ACCAN 2017*

**BIRRR is concerned that Sky Muster cannot support the needs of RRR priority assist consumers, health clinics, medical facilities and tele-health services.**

"However, many regional and remote areas have very poor internet connections, with relatively small download allowances, and at a much higher cost and slower speed than the services available in our cities," Bartone notes. "Many rural doctors told us of the problems they encounter with slow and unreliable internet access, not only for conducting day-to-day business, but also for caring for patients via eHealth and telemedicine."

"As mainstream health care provision becomes increasingly technology-based, and requires larger amounts of data and faster broadband services, there is a real risk that regional, rural, and remote areas of Australia will be left further and further behind."

*ZDnet 2017*

The nbn™ Sky Muster satellite network is **not configured to provide voice call access to emergency services** as emphasised by nbn™ in its Sky Muster Service Users Guide:

"Can I use the nbn™ Sky Muster™ service for Voice over IP (VoIP) services? "  
"Your internet service provider **may** offer a VoIP service and **may** need additional equipment. This service does **NOT** replace your normal telephone landline and should not be relied upon for emergency calls.

*nbn™ 2016h, p.12*

Australian Communications Consumer Action Network (ACCAN) also recommends to consumers that alternative options to nbn™ Sky Muster should be considered in case of emergencies.

Lives can be lost without robust telecommunications in the event of severe weather, emergency calls, fire and other natural disasters nbn™ Sky Muster should not be relied on to be the **ONLY** form of telecommunications available to regional Australia

*ACCAN 2016*

Pedal wireless was revolutionary in the 1920's, as, for the very first time, medical help could be RELIABLY summonsed from the outback. No electrical power was required, and no special technical skills. Fast forward to 2017 and we find that we are turning the clock back to the 18th century.

Due to the limitations of VoIP over Sky Muster, as already discussed in this submission, there is no doubt that accessibility to essential services will be severely jeopardized if RRR consumers have to rely solely on the Sky Muster platform. RRR consumers will no longer be able to reliably summons medical help and support, if the Draft recommendations for the TUSO are implemented.

## 8.2 National Voice and Video Relay Services

The National Relay service is an important Federal Government initiative, which uses a wide variety of electronic communication media to ensure the very best user experience.

BIRRR has identified the following National Relay Services that are most likely compromised by the nbn™ network, as the sole provider of communication and connectivity to a premise.

### **The National Video Relay Service**

The National Video relay service is established between two parties, using Skype™ as the video and voice medium. This is a non-managed OTT VoIP service. Skype™ uses a proprietary encoding protocol and is never treated as a VoIP traffic. Thus, Skype™ is always carried by best effort TC-4.

Skype™ suffers degradation during Sky Muster busy periods and during network fault. It is often unusable. Skype™ as a medium cannot provide a reliable Video Relay service on Sky Muster.

### **Text Relay**

Text relay and many of the other Voice Relay services uses a special teletypewriter (TTY) phone at the speech impaired users end. It works well and very reliably over the legacy POTS network.

For TTY to successfully work on a VoIP service, it requires a near perfect VoIP channel and special VoIP channel configuration. These demands equate to Quality of Service (QoS) parameters which are challenging to achieve, and with which Sky Muster simply cannot comply.

"For TTY to be successfully transmitted over a data network, it must use a non-compression encoder / decoder (CODEC), such as G.711. Using compression CODEC, such as G.729a, will distort the TTY tones causing errors and makes the TTY conversation un-readable. Besides using the appropriate CODEC, the network should also enable quality of service (QoS). QoS prioritize voice & TTY packets are delivered. QoS also helps prioritizing the Voice & TTY traffic over data traffic, thus guaranteeing consistent quality of service. The effect of packet loss on TTY is great. Having a network with more than 0.12 percent packet loss can result in greater than one percent Total Character Error Rate (TCER), which will make the network not compliant to Section 508 or usable by TTY machines.

VoIP is capable of supporting TTY traffic; however, consideration must be made to the network to ensure support of both voice and TTY. These same considerations are what are being used to design most enterprise voice networks today."

*Pitchford 2004*

### 8.3 Un-metering

Many local, state and federal government services are now solely or primarily available online. The PC must consider promoting the implementation of un-metering of all key Australian Government websites. In particular those which provide essential services such as the Australian Taxation Office (ATO), Centrelink, Medicare, e-health as well as emergency information sites such as Bureau of Meteorology, State & Territory Road and River condition report websites.

*“For instance, myGov is now one of the biggest digital services in Australia, with 10 million registrations on its website and an average of 160 000 people using the platform each day. The Government’s recent expansion of its digital transformation agenda is clearly intended to reinforce this trend by making access to government services more user-friendly and digital by default.”*

*P 9 Draft Report*

**Agencies such as the ATO, Centrelink and Medicare must maintain an alternative to online services for those living in remote areas until such a time that equitable access to broadband is reached.**

### 8.4 Education

VoIP over nbn™ Sky Muster is not an adequate solution for distance education students. Information and Technologies Branch, Department of Education, Training and Employment, Queensland, senior education and technical staff have advised ICPA (QLD) Inc. that latency issues on Sky Muster have created a recommendation to Schools of Distance Education that satellite VoIP be considered not suitable for students for lower primary years (Kindergarten to year 3) (ICPA QLD).

nbn™ Sky Muster services severely limit children requiring data for education purposes. Sky Muster customers are limited to one connection, which (in many cases) needs to be ‘rationed’ for business, health, education and personal needs. As such, there is a huge risk that RRR children and tertiary students will be unable to access the internet adequately for their studies, and will fall behind their metropolitan peers. Whilst the development of the educational port for distance education and home school students using Sky Muster services is a welcome initiative, it is not accessible for tertiary students or primary and secondary students in mainstream schools who also need internet access to complete homework and assignments.

**“In Australia, primary school children are spending an average of 1.8 hours online each weekday in order to complete their homework after school. The amount jumps to three hours when students reach high school.”**

*nbnco blog*



#### BIRRR Case Study 13

Carolyn is located at Bonnie Doon, Victoria. She struggles each month to divide her 40GB monthly nbn™ Sky Muster download allowance between her farm business, work, volunteer commitments, personal use and three data-hungry school children.

*'My son is about to enter Year 12 and can't use the internet at home for downloading anything substantial,' said Ms Suggate, who has an online beef and lamb business, and is the administrator of the Organic Federation of Australia. 'They talk about the difficulties of remote students, but we're not in the Kimberleys. Imagine telling a city kid that they can't get internet after school?'*

Carolyn and her family live a 20-minute drive from Mansfield in north-east Victoria but fall 2km outside of the reach of the local nbn™ fixed wireless tower. They have had to sign up to the nbn™ satellite service, which caps their data allowance at 40GB a month during the nbn™ -defined peak period of 7 am to 1 am.

*'We've got access to another 100 gigs a month, off peak, but that is from 1am to 7am,' she said—not much use. Not only is data and access a problem but she also talks about the problems they are having with the system. Since connecting to the nbn™ satellite system 10 weeks ago, Ms Suggate and her family have experienced an outage a week, most of which last for hours, not minutes. It is now at the point where Carolyn has had to sacrifice paid work for her children's education.*

<http://www.weeklytimesnow.com.au/news/data-drought/data-drought-were-in-bonnie-doon-not-the-kimberleys/news-story/cc1c6b2219dc63d33e341210441c93>

## 8.5 Lack of Mobility

Although work is being undertaken by nbn™, as yet Sky Muster is not a mobile technology. It is not available for tourists, travelers, remote stock camps, mobile businesses and those with no fixed address. As many of these consumers need voice and broadband accessibility in areas with no mobile reception it is imperative that an affordable mobile solution is developed as soon as possible.

## 8.6 Business

Traditionally in many RRR areas businesses and homes share one nbn™ Sky Muster connection and as such this limitation has severe impacts on businesses for those mapped for nbn™ Sky Muster technology. Essential services such as banking, data entry, calculation and payment of wages, ordering of parts and equipment, weather alerts and warnings including flood, fire and storm all require reliable connectivity. RRR businesses cannot access business plans on Sky Muster and therefore must ration their data. Remote desktop programs such as cloud accounting are prone to difficulties due to the latency involved with the high orbit Sky Muster satellite. In the event of an outage business requirements are not

able to be completed when there is no working connection. This includes remote booking facilities for accommodation, eftpos terminals, unpaid wages and considerable flow on effect to communities and economy.

#### BIRRR Case Study 14

Yaraka grazier Anne-Maree Lloyd had been enjoying her new Sky Muster satellite internet service for just a week when she received an email to say an upgrade would be conducted overnight and service would be down for a few hours. She woke up in the morning to find that her internet service hadn't come back on, and it remained that way for the next 12 days.

Anne-Maree said none of the parties involved were talking to each other.

"We kept telling our service provider there was a whole group of us, all using different providers, so it couldn't be a problem with the equipment," she said. "They treated it as individual issues."

Anne-Maree and her husband Jeff had organic cattle yarded for trucking but couldn't download the paperwork for them, nor could they check AuctionsPlus prices to make marketing decisions.

"It was becoming a real issue for us," she said. "We were real third class citizens for a while – no power (they generate their own), no mobile service and no internet."

Anne-Maree's shirt-making business was affected when she couldn't access orders coming in, and work compiling a newsletter for the local community was put back.

Her closest mobile phone access is a two-and-a-half hour drive away.

When her internet service returned early this week, she was left with over 800 messages to work her way through.

<http://www.queenslandcountrylife.com.au/story/4222354/sky-muster-communication-call/>

The PC must ensure that businesses, tele-health and education services are not jeopardised by inequitable voice and Broadband services, in particular those using nbn<sup>TM</sup> Sky Muster as their only form of Broadband. It must be remembered that in nbn<sup>TM</sup> Sky Muster mapped areas many end users have **ONLY ONE** connection, which is limited in data allowance and reliability, to operate their business, educate their children, participate in tele-health and further education & for personal use. The removal of existing USO landline guarantees would have harmful flow on effects to RRR communities, making them less attractive for farming business, recreation and residential lifestyles. Poor and declining internet services regularly, directly and severely impact RRR businesses, impacting success, bottom lines and ability to retain employees.

## 9. INFERIOR TECHNOLOGY CHOICE

### DRAFT RECOMMENDATION 7.1

*The Australian Government should introduce legislation as soon as possible to make explicit the role of nbn<sup>TM</sup> as a universal service provider of wholesale broadband services.*

*P 22 DRAFT USO*

**BIRRR believes this would be a momentous mistake for the Productivity Commission and have severe implications for those mapped for nbn<sup>TM</sup> Sky Muster services who currently choose alternative options for connectivity.**

Copper Continuity Obligation (CCO) is the obligation under the TUSOP (Telstra USO Performance) Agreement, which requires Telstra to operate and maintain its existing copper network in areas outside of nbn<sup>TM</sup> fixed-line footprint for the provision of fixed voice services. The CCO must remain in place for all consumers mapped for nbn<sup>TM</sup> Sky Muster and fixed wireless services. To remove the CCO would place consumers mapped for nbn<sup>TM</sup> inferior technologies in a **very treacherous position**.

### **How you connect now is no guarantee for the future.**

“NBN Co has refused to disclose how many premises with existing ADSL connections will be offered only satellite services in future, revealing what users have now is “not so much a driver of NBN’s technology choice”.

The network builder all but confirmed that having an existing fixed line service is no guarantee of future fixed line connectivity under the NBN.

This could particularly be a problem for internet users living on the low-density metropolitan fringe, as well as those in regional or rural Australia.

“NBN Co’s mandate is to provide broadband access to all premises in Australia with some form of NBN technology, whether that be fixed line, fixed wireless or satellite,” the company said in a response to budget estimates hearings published over the Australia Day long weekend.

“The technology that may already be available in an area (for example ADSL or 4G etc) is not so much a driver of NBN Co’s technology choice as other factors such as the cost per premises of servicing the area.

“With some exceptions, satellite is typically a cost-effective solution in non-metropolitan areas where there is either no line of sight to a fixed wireless tower or where there is low population density.”

*Crozier, IT News, 2017*

Due to limitations already discussed, there are a growing number of RRR consumers choosing not to connect to Sky Muster. To meet their consumer and business needs, around 40% of those mapped for Sky Muster are connecting to services such as ADSL, mobile broadband and alternate fixed wireless providers or choosing not to get connected at all. Out of the 412,000 residences mapped for Sky Muster nbn<sup>TM</sup> only expects 250,000 to connect to the service. nbn<sup>TM</sup> does not offer superior technology to all Australians and these consumers need guarantees that they can access existing and future technology services for their voice and broadband needs.

**BIRRR Member Case Study 13 (Geoff):** Copper is not only being used for voice in the bush and for many of us nbn<sup>TM</sup> satellite was not an upgrade and therefore while it is our designated form of nbn<sup>TM</sup> we have chosen to stick with non-nbn<sup>TM</sup> copper (ADSL) based internet and voice services.

So in fact, many of these customers will be forced to take a step BACK in service quality if services such as ADSL are not serviced and maintained in these areas.

If 412,000 addresses are mapped for nbn<sup>TM</sup> Sky Muster but uptake is only expected to be 250,000, where does this leave the remaining residences and businesses in regards to infrastructure and technology choice?

nbn<sup>TM</sup> have stated that only 60% of those mapped for Sky Muster will connect to the service. Table 1 demonstrates the number of towns in WA that currently receive ADSL technology yet are mapped for nbn<sup>TM</sup> Sky Muster.

Due to nbn<sup>TM</sup> mapping and commercial in confidence restrictions the total number of ADSL communities mapped for Sky Muster is difficult to estimate. There are a large number of towns in Queensland including Alpha, Richmond, Quilpie, Windorah, Cunnamulla and Birdsville who are all mapped for Sky Muster but currently have superior broadband services available.

<b>WA ADSL Exchange Name</b>	<b>NBN Technology</b>	<b>Area Population 2011</b>
BRUCE ROCK	SATELLITE	721
CARNAMAH	SATELLITE	496
COOROW	SATELLITE	161
CORRIGIN	SATELLITE	828
CUE	SATELLITE	228
DUMBLEYUNG	SATELLITE	198
HYDEN	SATELLITE	520
KONDININ	SATELLITE	281
KULIN	SATELLITE	330
LAKE GRACE	SATELLITE	507
LAVERTON	SATELLITE	730
LEINSTER	SATELLITE	732
LEONORA	SATELLITE	779
MEEKATHARRA	SATELLITE	812
MORAWA	SATELLITE	906
MOUNT BEAUMONT	SATELLITE	50
MOUNT MAGNET	SATELLITE	424
MULLEWA	SATELLITE	729
NAREMBEEN	SATELLITE	469
NULLAGINE	SATELLITE	177
PANNAWONICA	SATELLITE	686
PERENJORI	SATELLITE	260
QUAIRADING	SATELLITE	648
THREE SPRINGS	SATELLITE	391
WILUNA	SATELLITE	681
WYNDHAM	SATELLITE	669
YALGOO	SATELLITE	120

*Figure 30 WA ADSL towns mapped for Sky Muster – Source Great Northern Telecommunications*

Also, during the roll out of nbn™, if parts of a Telstra pillar exchange are upgraded to Vertical Deflection Supplementary Listing (VDSL), ADSL will need to be switched off after 18 months, regardless of whether you are actually covered by the FTTN network.

#### BIRRR Case Study 15 COONABARABRAN

Figure 28 below shows a map of Coonabaraban, NSW, highlighting nbn<sup>TM</sup> fixed line rollout (red) and the rough boundary of where premises currently receive ADSL. Once nbn<sup>TM</sup> fixed line is rolled out in the red areas those not in the footprint will have their ADSL services 'switched off'. ADSL cannot exist at the same time as the fixed line nbn<sup>TM</sup>. This includes the Coonabaraban industrial area and a large number of businesses.

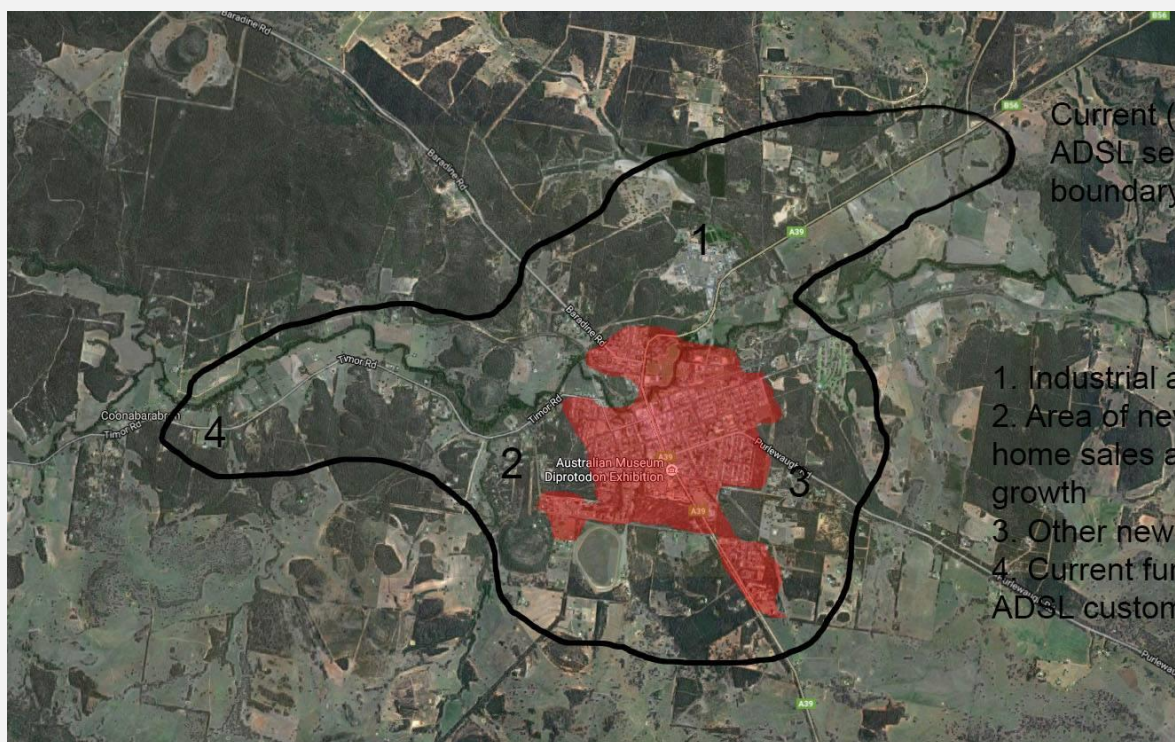


Figure 31 Map of Coonabaraban, NSW

[www.facebook.com/CoonaComputerHospital/](http://www.facebook.com/CoonaComputerHospital/)

Key questions include:

- \* Does nbn<sup>TM</sup> Sky Muster have the capacity for all end users to have a VoIP service as well as data use?
- \* What if nbn<sup>TM</sup> predictions are incorrect and more than 250,000 take up Sky Muster?

nbn<sup>TM</sup> roll out plan was instructed to deliver a 25 Mbps broadband download speed service to all Australians, **there is no mandate on nbn<sup>TM</sup> to deliver a USO equivalent voice service** and little research and understanding of the complex issues surrounding both the provision and maintenance of a VoIP customer service.



BIRRR Case Study 16 - 17

I live in Northcliffe in WA. Just looking at this town, which has a pretty standard communications and settlement profile for the Australian bush, I notice that loss of ADSL services would result in the Sky-Muster satellite having to provide for **three times** as many customers than it will, while we still have ADSL as an option.

**BIRRR Case Study 16:** Matt Wilkinson lives 8km from Adelaide's central business district and will lose his ADSL2 connection when nbn is rolled out in his suburb, as the service's copper wires will be neutered (to avoid signal interference) to make way for the new FTTN connections to his neighbours. There are also another 15 premises on Matt's road in the same situation, and another 15 or so on another nearby road.

*It appears that a number of the premises may actually require physical infrastructure such as trees to be removed to allow satellite dishes to be installed — even though they are already served by existing copper cable.*

[https://delimiter.com.au/2016/01/05/nbn-fttn-kills-off-adsl-for-metro-customer-to-be-replaced-with-satellite/?utm\\_content=bufferb7bb2&utm\\_medium=social&utm\\_source=facebook.com&utm\\_campaign=buffer](https://delimiter.com.au/2016/01/05/nbn-fttn-kills-off-adsl-for-metro-customer-to-be-replaced-with-satellite/?utm_content=bufferb7bb2&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer)

<http://www.weeklytimesnow.com.au/news/data-drought/data-drought-suburbs-add-to->

It is not only regional towns that are being pushed onto Sky Muster, the BIRRR team have an alarming number of metropolitan residences that will have no other option but to accept a degradation in connectivity.

**If all of a consumers telecommunications are bundled into one unreliable technology, such as nbn™ Sky Muster, this would be unlikely to meet minimum standards or guarantees, would breach existing TUSO requirements and would have devastating consequences for those trying to live, work and educate children in regional Australia.**

## 10. INFORMATION REQUEST 7.1

*Participants are invited to comment on the advantages and disadvantages of providing Indigenous communities in regional and remote areas with an Indigenous telecommunications program that addresses their particular needs, or whether their needs could be met through service-specific (that is, community-wide) programs.*

PC DRAFT USO p.25

While BIRRR does not have specific expertise or experience of the needs of indigenous communities they would support funding which is mutually beneficial for all Australians regardless of race, culture or socio-economic status. We recommend specific consideration be given to Broadband for The Bush Alliance who are very conversant with work in this area.

## 11. INFORMATION REQUEST 9.1 – Transition options

*Participants are invited to comment on the relative merits of the following (or other feasible) transition options for the standard telephone service USO module of the Telstra USO Performance (TUSOP) Agreement.*

- *Option 1: Amend the Telecommunications (Consumer Protection and Service Standards) Act 1999 (Cth) to change the scope of the current standard telephone service USO, thereby forcing the parties to negotiate a payment adjustment under the Agreement.*
- *Option 2: Remove the standard telephone service USO in all areas once the NBN rollout is complete.*
- *Option 3: Commence a staged wind-back of the standard telephone service USO in NBN-connected areas as soon as practicable.*

*P 25 DRAFT USO*

**None of the three options listed in the Draft Report on the Telecommunications Universal Service Obligation are feasible alternatives for the provision of voice services in RRR Australia.**

The Productivity Commission has falsely assumed, that the nbn™ Network is a suitable replacement for current fixed line services. It is not. nbn™ was **not commissioned** to provide voice services and this Government direction must be respected.

*“The Government is committed to completing the network and ensuring that all Australians have access to **very fast broadband** as soon as possible, at affordable prices, and at least cost to taxpayers. The Government expects the network will provide peak wholesale download data rates (and proportionate upload rates) of at least 25 megabits per second to all premises, and at least 50 megabits per second to 90 per cent of fixed line premises as soon as possible.”*

*Department of Communications & The Arts, 2016*

If Option 3 is considered it must **only** take effect in areas that have received nbn™ fixed line connectivity. None of the other nbn™ technologies can currently demonstrate sufficient QoS, reliability, accessibility, and affordability. Consumers who are mapped for nbn™ Sky Muster and Fixed Wireless technologies must have standard telephone services maintained indefinitely, until superior technology meets baseline standards. A consistent form of voice communication service, which is distinct and independent of nbn™ satellite broadband, must be available to all who live in RRR areas.

*In the emerging global digital economy access to high quality, reliable broadband for data and voice services is a key enabler. So it is reasonable for government to ensure telecommunications infrastructure investment drives national economic growth, and this means investment beyond the urban regions.*

*Gregory, M, 2016*

It is vital that the Australian Government and telecommunication industry stop focusing so much on the **speed** of broadband services and start delivering **reliability, affordability,**

**accessibility, QoS and customer service.** Progression and innovation in RRR areas simply cannot proceed without these essential baseline components, regardless of speeds offered.

Research and investment into alternate voice and broadband delivery modes for RRR communities should note the following considerations.

**1. It is imperative that a funding commitment and comprehensive plan is developed to securely replace ageing fixed line copper and other last mile communication services in RRR, before the expiration of the TUSOP.**

- Alternate fixed line technologies are advancing very rapidly and Australia is well placed to choose the **very best fixed line alternative for copper.**

- The hardware and firmware for the chosen technology should be manufactured in Australia.

- There is an urgent need for a review into **TCRN services.** These RRR 'landlines' are currently not meeting existing USO requirements and some have a very short remaining lifetime.

- **Sky Muster has a 15 year service life** and should be used **only for remote homesteads** and then **only with an alternative guaranteed landline service.** Sky Muster cannot provide sufficient quality nor sufficiently secure voice and broadband communication, which are now an accepted part of the 21st Century. Sufficient QoS and an availability of greater than 99.9% are fundamental for regional and remote community communications.

- Then the 15 year service life of Sky Muster and the terms of the current TUSO, provide sufficient time to **re-build this small but significant sector of the telecommunications Customer Access Network.** During this period townships that currently enjoy ADSL services, but are mapped for Sky Muster should be upgraded to nbn<sup>TM</sup> Fibre to the drop point (FTTdp) as for their city cousins.

**2. BIRRR does NOT support Telstra's view that Sky Muster can be optimised to provide RRR baseline voice services,** for the reasons outlined extensively in this submission.

"We recommend that Telstra, the Government and nbn<sup>TM</sup> co. investigate how Sky Muster can be optimised for voice. Once that work is done, the Government should review Sky Muster's suitability for the delivery of the USO."

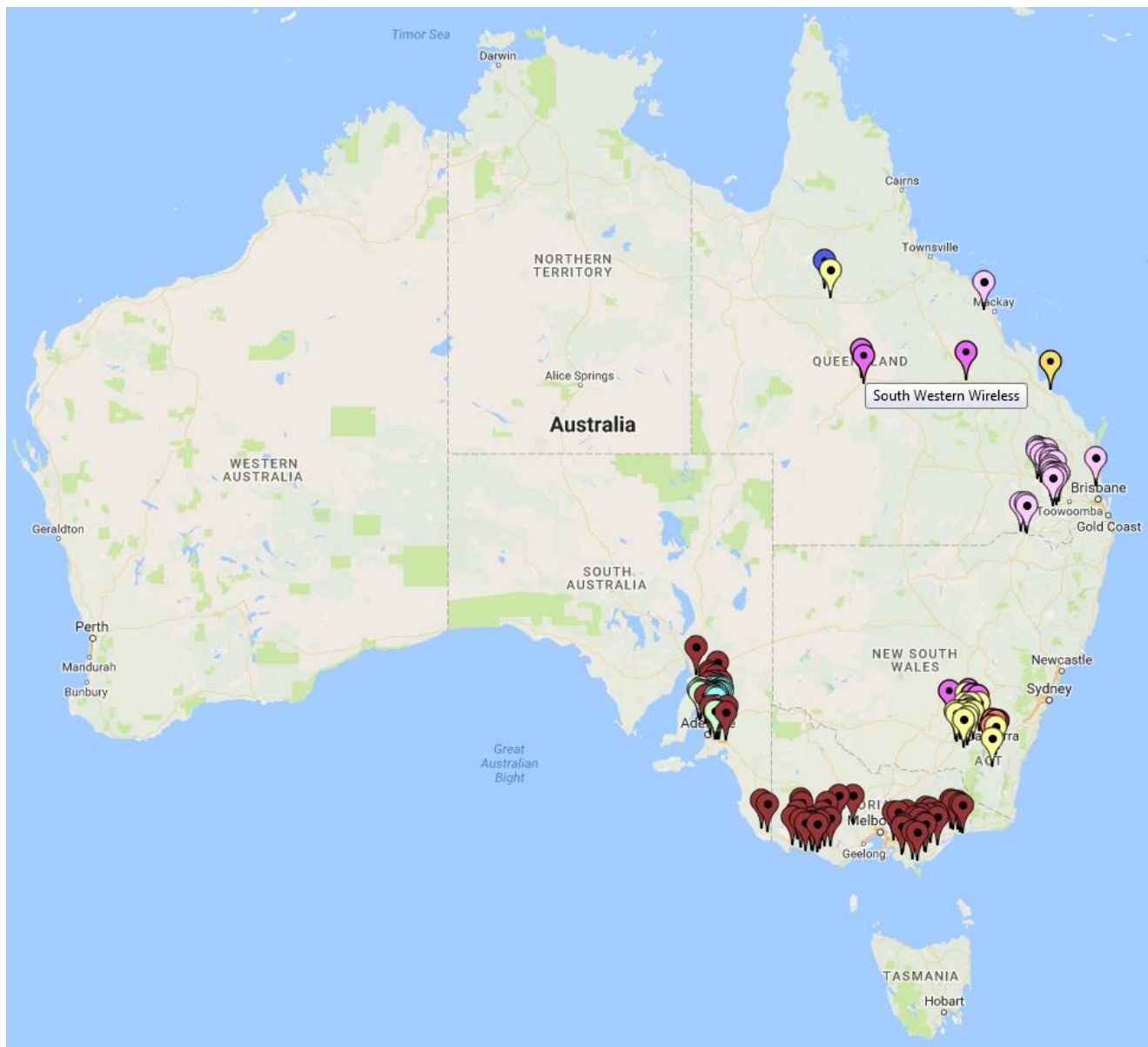
Telstra, January 2017

**Sky Muster is an unacceptable and inadequate replacement for the delivery of the USO.**

3. **BIRRR believes that nbn<sup>TM</sup> policy and direction must be reviewed.**  
RRR consumers are concerned that too much emphasis has been placed on providing minimum speeds, without a clear focus on customer needs and service guarantees. A broadband USO should include more than just upload and download speeds and must reflect minimum data allowances, availability, accessibility, affordability, latency and customer service as baseline requirements.
4. **Significant funding and comprehensive planning should be directed at innovative telecommunications projects specifically designed at covering gaps in RRR areas.**  
Funding should be managed to ensure infrastructure, service provision, customer service and consumer education are equally respected.
5. **Alternate wide coverage internet and voice solutions should be investigated** such as Low Earth Orbit (LEO) satellites with 200ms latency and 4G fixed wireless technology for specific RRR locations.
6. **Mobile networks should be expanded in both coverage and data bandwidth and service guarantees should be applied to these networks.** Further development of subsidized boosters and antennas should occur to maximize coverage for remote homesteads.
7. **New infrastructure projects in RRR areas should be required to partner with telecommunications infrastructure providers to share infrastructure and improve mobile technology for communities.** Incentives should be delivered for RRR premises and communities to improve existing infrastructure, similar to Broadband 4 the Rural North (B4RN) initiative in the UK.
8. **Should nbn<sup>TM</sup> become the UIP, alternate nbn<sup>TM</sup> fixed wireless service providers would have little incentive to continue their roll outs.** These organisations should be encouraged and funded to continue building infrastructure in poorly served areas. These services should have the same CSG as existing TUSO requirements.

There are already large numbers of these providers in operation as shown on the BIRRR Alternate fixed wireless map, which can be viewed here, <https://birrraus.com/alternative-fixed-wireless-providers/>

Figure 32 Alternate Fixed Wireless Providers, BIRRR 2017



## 12. Summary

### Are we reducing the digital and communications divide or widening it?

**The Productivity Commission should develop a visionary plan that provides a baseline voice and broadband service for RRR Australians.** This recommendation MUST provide a clear strategy to address existing infrastructure shortfalls and a rational approach to RRR telecommunications.

At a time when so many separate enquiries and studies are occurring in the telecommunications space, we are astounded that there is no uniform scheme proposed to deliver reliable and equitable voice and broadband services for RRR areas.

Furthermore there needs to be a clear directive that the Government, nbn<sup>TM</sup> and the telecommunications industry, including providers,

“...should be engaging proactively with those in regional and remote Australia who have historically been at an access disadvantage.”

Appendix L

**BIRRR’s suggested key recommendations for targeted funding and actions must be implemented urgently. This will ensure that ensure RRR Australians are not subjected to inferior telecommunications outcomes, and that the digital divide is not further widened.**

*The BIRRR team would like to recognize the huge amount of volunteer hours (and broadband data) spent compiling this submission. It was extremely difficult to coordinate cloud-based storage and editing systems, between several key Sky Muster service contributors. Sky Muster provides very poor support for cloud based applications due primarily to the satellite latency. During the preparation of the submission the amount of Sky Muster network downtime was also incredibly frustrating. We acknowledge the patience of the Productivity Commission in allowing an extension for the BIRRR submission. We also urge the Productivity Commission to acknowledge the input of this extensive submission and other submissions made by the Regional, Rural and Remote Communications Coalition (RRRCC).*





## References

- ABC Rural, 2016, 'WA farming community frustrated and angry at regular power outages during summer', <http://www.abc.net.au/news/2017-01-12/anger-at-power-out-on-farms-in-wa/8178562>, accessed 19 January 2017
- ABC, 2016, 'SA storms: Calls for compensation to increase as thousands go a third day without power'<http://www.abc.net.au/news/2016-12-30/south-australia-storm-power-outage-affecting-thousands-of-homes/8153706>, accessed 19 January 2017
- ABS. 8146.0 - Household Use of Information Technology, Australia, 2014-15, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/8146.0>, accessed 20 January 2017
- ACCAN, 2017, 'Voice services', <http://accan.org.au/broadband/satellite/voice-services>, accessed 20 January 2017
- ACMA cracks down on illegal mobile phone signal boosters, [http://www.mcf.amta.org.au/newsletters/Mobile\\_InSite\\_July\\_2015?Article=45418](http://www.mcf.amta.org.au/newsletters/Mobile_InSite_July_2015?Article=45418)
- ACMA, 'Connection repair and appointment timeframes' <http://www.acma.gov.au/Citizen/Phones/Landlines/The-nbn™-and-you/connection-repair-and-appointment-timeframes>, accessed 20 January 2017
- Alternative Fixed Wireless Providers, <https://birraus.com/alternative-fixed-wireless-providers/>
- Aussie Broadband Speed Test Thread, <https://forums.whirlpool.net.au/forum-replies.cfm?t=2602541>
- Australian Bureau of Statistics (ABS), 2016, 'Household Use of Information Technology, 2014-15',
- Australian Communications and Media Authority (ACMA), 2016, 'CSG standard: Your rights', <http://www.acma.gov.au/Citizen/Phones/Landlines/Phone-connection-and-repair/waiver-of-rights-under-the-csg-standard-fact-sheet>, accessed 20 January 2017
- Australian Communications Consumer Action Network (ACCAN), 'What to expect from a Sky Muster broadband service', <http://accan.org.au/broadband/satellite/expect-sky-muster>, accessed 20 January 2017
- BIRRR, 2016 Regional Internet Access Survey, [www.birraus.com.au](http://www.birraus.com.au)
- BIRRR, 2017 Sky Muster Survey – available on Website mid February, 2017 [www.birraus.com.au](http://www.birraus.com.au)
- BIRRR, <https://www.facebook.com/groups/BIRRR/>
- Boyne Valley woman, Dot Hughes, raced to hospital, <http://www.gladstoneobserver.com.au/news/the-valley-people-wont/3064930/>
- Bureau of Meteorology (BOM), 2016, 'Average Annual Thunder-day and lightning flash density', [http://www.bom.gov.au/jsp/ncc/climate\\_averages/thunder-lightning/index.jsp](http://www.bom.gov.au/jsp/ncc/climate_averages/thunder-lightning/index.jsp), accessed 19 January 2017
- Communications Alliance Ltd, '3.11 Definition of the Standard Telephone Service', <http://www.commsalliance.com.au/Standards-Guidance/3-standards-writing/3.11>, accessed 20 January 2017
- Coroner clears Telstra over boy's death, [www.abc.net.au/news/2003-07-09/coroner-clears-telstra-over-boys-death/1883118](http://www.abc.net.au/news/2003-07-09/coroner-clears-telstra-over-boys-death/1883118)
- Cripps, S (2016) <http://www.queenslandcountrylife.com.au/story/4222354/sky-muster-communication-call/>
- Crozier, R <http://www.itnews.com.au/news/nbn-co-wont-say-how-many-adsl-users-will-end-up-on-satellite-449011> CROZIER accessed 30th January 2017
- Data Drought: 'We're in Bonnie Doon, not the Kimberleys', <http://www.weeklytimesnow.com.au/news/data-drought/data-drought-were-in-bonnie-doon-not-the-kimberleys/news-story/cc1c6b2219dc63d33e341210441c93>

Data Drought: suburbs add to internet pressure, <http://www.weeklytimesnow.com.au/news/data-drought/data-drought-suburbs-add-to-internet-pressure/news-story/8248582bce63c71c2a51a985c465e606>

Dept. Communications, 2016 nbn Statement of Expectations  
<https://www.communications.gov.au/departmental-news/statement-expectations-nbn-co>

G.114, <https://en.wikipedia.org/wiki/G.114>

Great Northern Telecommunications,  
[https://www.communications.gov.au/sites/g/files/net301/f/submissions/Great\\_North\\_ern\\_Telecommunications.pdf](https://www.communications.gov.au/sites/g/files/net301/f/submissions/Great_North_ern_Telecommunications.pdf)

Gregory, M, 2016, <http://www.innovationaus.com/2016/12/USO-hurdles-yet-to-be-overcome/>  
 Gregory, M 13/12/16

Harris Caprock, 2012, Not all bands are created equal: A closer look at Ka & Ku high throughput satellites ',  
[http://www.harriscaprock.com/downloads/WP\\_HarrisCapRock\\_WhitePaper-Ka-Ku\\_Analysis.pdf](http://www.harriscaprock.com/downloads/WP_HarrisCapRock_WhitePaper-Ka-Ku_Analysis.pdf), accessed 20 January 2017

High availability, [https://en.wikipedia.org/wiki/High\\_availability](https://en.wikipedia.org/wiki/High_availability)

Hunt, P, Dec. 2016 Data Drought: Suburbs add to internet pressure

InnovationAus.com, 2016, 'USO hurdles yet to be overcome',  
<http://www.innovationaus.com/2016/12/USO-hurdles-yet-to-be-overcome/>, accessed 20 January 2017

Is there any way to find out when the problem nbn in ballarat is getting upgraded?,  
<https://forums.whirlpool.net.au/forum-replies.cfm?t=2594872&p=32#r637>

Jxeeno, 2016, 'The irony of NBN's satellite numbers' 26 June 2016, <http://blog.jxeeno.com/the-irony-of-nbns-satellite-numbers/>, accessed 20 January 2017

Lehey, G, 2016, 'Greg's why you don't want nbn™ satellite',  
<http://www.lemis.com/grog/Dereel/nbn™-Satellite.php>, accessed 20 January 2017

LeMay, R, 2016 NBN FTTN kills off ADSL for metro customer, to be replaced with satellite  
 Man lay dying as phone problems hamper family calling 000,  
[www.frasercoastchronicle.com.au/news/man-dies-as-call-to-000-cuts-out-man-dies-as-000-c/2444325/](http://www.frasercoastchronicle.com.au/news/man-dies-as-call-to-000-cuts-out-man-dies-as-000-c/2444325/)

Mobile Carriers Forum (MCF), 2015, 'ACMA cracks down on illegal mobile phone signal boosters',  
[http://www.mcf.amta.org.au/newsletters/Mobile\\_InSite\\_July\\_2015?Article=45418](http://www.mcf.amta.org.au/newsletters/Mobile_InSite_July_2015?Article=45418), accessed 18 January 2017

Mobile phone repeaters: information for consumers, <http://www.acma.gov.au/theACMA/mobile-phone-repeaters-information-for-consumers>

Mobile Satellite Technologies, 2016, <https://www.mobilsat.com/Satellite-VoIP-voiceoverIP/voip.php>, accessed 19 January 2017

National Rural Health Alliance (NRHA), 2017, 'Telecommunications Universal Service Obligation, submission to the Productivity Commission,  
[http://www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0003/212646/subdr089-telecommunications.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0003/212646/subdr089-telecommunications.pdf), accessed 20 January 2017

NBN Co Ethernet Bitstream Service FTTB/FTTN,  
[http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-service-levels-schedule\\_20161205.pdf](http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-service-levels-schedule_20161205.pdf), accessed 20 January 2017

NBN FTTN kills off ADSL for metro customer, to be replaced with satellite,  
<https://delimiter.com.au/2016/01/05/nbn-fttn-kills-off-adsl-for-metro-customer-to-be-replaced-with-satellite/>, accessed 2nd February , 2017

nbn, [http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-fair-use-policy\\_20160407.pdf](http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-fair-use-policy_20160407.pdf)

NBN: Who gets the most Sky Muster satellite coverage?, <https://www.finder.com.au/nbn-who-gets-the-most-sky-muster-satellite-coverage>

nbnco limited, 2016a, 'Sky Muster™ Factsheet', <http://www.nbnco.com.au/content/dam/nbnco2/documents/sky-muster-fact-sheet.pdf>, accessed 20 January 2017

nbnco limited, 2016b, User Guide: Sky Muster™ service, <http://www.nbnco.com.au/content/dam/nbnco2/documents/sky-muster-satellite-user-guide.pdf>, accessed 20 January 2017

nbnco limited, 2016c, 'Service Levels Schedule: Wholesale Broadband Agreement', [http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-service-levels-schedule\\_20161205.pdf](http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-service-levels-schedule_20161205.pdf), accessed 20 January 2017

nbnco blog, 2017, 'Students in 2017: Aussie kids set to spend more time online for school', <http://www.nbnco.com.au/blog/education/aussie-kids-set-to-spend-more-time-online-for-school.html?cid=socmed%3Afacebook%3Aoutbound%3Ablog%3A01%2F23%2F17>, accessed 28 January 2017

nbnco limited, 2017, 'Corporate plan', p61, <http://www.nbnco.com.au/content/dam/nbnco2/documents/nbn-corporate-plan-2017.pdf>, accessed 20 January 2017

Network Status - IPSTAR Australia - the nbn™ Satellite Internet Experts, <http://www.ipstarbroadband.com.au/status/>

Oz Towers, Providing mobile tower information to the Australian public, <https://oztowers.com.au>

PC USo Draft report, <http://www.pc.gov.au/inquiries/current/telecommunications/draft>

Pitchford, D., 2004, 'Fact or Fiction – TTY works over voice over IP', Center On Disabilities Technology And Persons With Disabilities Conference 2004, California State University, <http://www.csun.edu/~hfdss006/conf/2004/proceedings/265.htm>, accessed 27 January 2017

Pitchford, D., Conference Proceedings (2004), <http://www.csun.edu/~hfdss006/conf/2004/proceedings/265.htm>

QoS, <http://www.voip-info.org/wiki/view/QoS>

RAPAD, 2015 <http://www.rapad.com.au/>

Remote Structures, <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure>

RTIRC, 2015 <http://www.rtirc.gov.au/wp-content/uploads/sites/2/2015/10/RTIRC-Independent-Committee-Review-2015-FINAL-Low-res-version-for-website.pdf>

SA Power Networks, 2016, 'Crews continuing to restore power following widespread damage to electricity distribution network', <http://www.sapowernetworks.com.au/public/download.jsp?id=59893>, accessed 19 January 2017

SkyMesh 2015, 'SkyMesh Customer Agreement', <https://www.skymesh.net.au/docs/SkyMesh%20Customer%20Agreement%20-%20nbn%20satellite.pdf>, accessed 20 January 2017

SkyMesh, 2017, 'SkyMesh SkyMuster Plans', <https://www.skymesh.net.au/services/nbn/satellite/lts.php>, accessed 20 January 2017

Supplementary Budget Estimates 2016–17, Communications and the Arts portfolio, [aph.gov.au/Parliamentary\\_Business/Senate\\_Estimates/ecctte/estimates/supp1617/communications%20and%20arts/index](http://aph.gov.au/Parliamentary_Business/Senate_Estimates/ecctte/estimates/supp1617/communications%20and%20arts/index), (October 2016)

The World's Fastest Rural Broadband, <https://b4rn.org.uk/>

University of Canberra, 2015, 'Section 3 Resilience and liveability: exploring determinants of wellbeing', [http://www.canberra.edu.au/research/faculty-research-centres/ceraph/regional-wellbeing/survey-results/2015/RWS2015\\_Web-Part-2.pdf](http://www.canberra.edu.au/research/faculty-research-centres/ceraph/regional-wellbeing/survey-results/2015/RWS2015_Web-Part-2.pdf), accessed 20 January 2017

West Wimmera Shire Council, Position Paper, National Broadband Network Service, <http://www.westwimmera.vic.gov.au/cms/userfiles/Docs/file2570040.pdf>

Whirlpool Forums:

Whirlpool, 2016, 'Forms – Other broadband – SkyMesh – SkyMesh – Down for everyone or just me?'. <https://forums.whirlpool.net.au/forum-replies.cfm?t=2522649&p=53#r1052>, accessed 20 January 2017

Who is responsible for 'x' NBN issue?, <https://forums.whirlpool.net.au/forum-replies.cfm?t=2594872&p=2#r28>

Wikipedia, 2016, 'High Availability', [https://en.wikipedia.org/wiki/High\\_availability](https://en.wikipedia.org/wiki/High_availability), accessed 19 January 2017

Woman's death leads to calls for 000 probe, <http://www.dailymercury.com.au/news/womans-death-leads-to-calls-for-000-probe/1745983/>

ZDNet, 2016, 'nbn<sup>TM</sup> users download more data per month than national average', [http://www.zdnet.com/article/nbn<sup>TM</sup>-users-download-more-data-per-month-than-national-average/](http://www.zdnet.com/article/nbn-tem-users-download-more-data-per-month-than-national-average/), accessed 20 January 2017

ZDNet, 2017 'Telehealth demands proper affordable broadband: AMA', <http://www.zdnet.com/article/telehealth-demands-proper-affordable-broadband-ama/>, accessed 20 January 2017

## Appendix A – BIRRR Baseline Voice and Broadband Service

BIRRR defines a baseline VOICE and BROADBAND service as one that delivers a universal reliability of 99.9% for all Australians, regardless of technology used. It must include fair and equitable repair times and a minimum QoS standard.

### Baseline voice services should provide:

Baseline voice services should provide an equal or superior service to the existing TUSO. A voice service must have a guaranteed minimum level of **reliability, affordability, accessibility and QoS**.

- That meets the needs of vulnerable groups within communities.
- That is technology neutral and supported by customer service guarantees.
- That is not adversely affected by latency, jitter or packet loss and not restricted by fair use policies.

### Baseline broadband services should deliver:

Baseline broadband services should deliver an equitable broadband service to all Australians. A broadband service that has:

- adaptable minimum speed
- sufficient data allowance
- affordability
- accessibility to all
- guaranteed reliability

The USO needs to ensure these minimum requirements are flexible and dynamic to ensure they change **reactively as minimum broadband requirements increase over time**. Minimum data limits must be reasonable (and adaptable, increasing as data needs increase) for all Australians and recognize the current exponential growth in data needs. The minimum data allowance must be reviewed on a regular basis to ensure that it maintains pace with technology requirements.

**A baseline voice and broadband USO should be regularly updated to reflect the needs and requirements of business, education, health and community welfare.**

## Appendix B - Satellite Internet in Australia – A user's perspective

John lives at Bindera NSW, some 25km by road from the township of Gloucester. His home has no mobile service and access to a reliable mobile service entails a 16Km drive towards the township of Gloucester. John has located a weak 3G mobile service on one of the higher hills on his property; however access is via 4WD and the journey is too treacherous in wet weather.

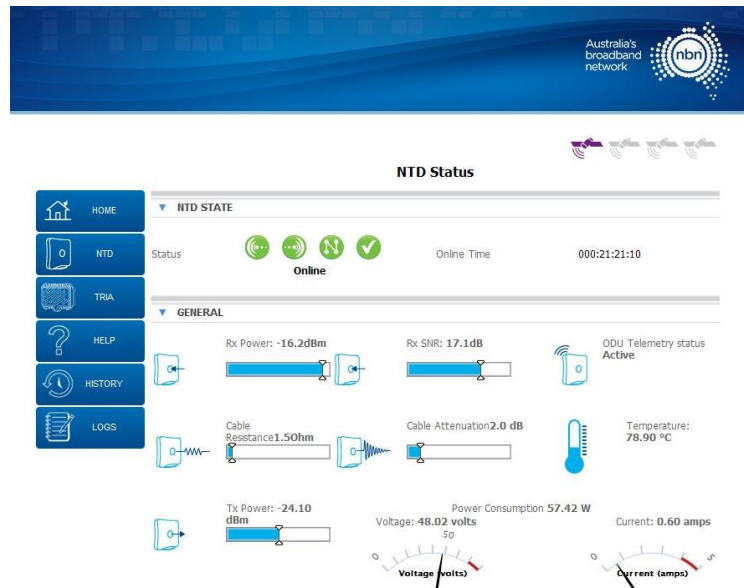
The home is serviced by a reliable fixed line telephone service. His landline is securely ploughed below the surface and safe from all but the very worst natural calamity. 240v mains power is unreliable and may fail at any time due to storm damage or other event.

John's first internet access at this location was by dial-up modem, however due to the 6km or so to the exchange, performance was very poor. John switched to satellite internet when the first ABG satellite service was launched and has used satellite internet access ever since.

To date, the nbn ISS has proved the most reliable and satisfactory, despite a brief period of congestion when its capacity was oversold. During the period that John used the ISS, he found that it only failed for relatively short periods and then only during torrential rain events. The ISS service outage pattern (due to rain events), was closely mirrored by that of his Ku band VAST television service. It did not suffer any other significant down-time and he cannot remember a fault outage. For business and social internet activities, he 'simply knew' that the ISS was 'always on'. He relied on it to conduct his agricultural business and for social activities. He reports that one failing of the ISS was that it could not reliably support an IP Telephony voice service (VoIP). His ISS 60GB plan was just adequate for purpose.

In May 2016, the nbn Ku band 6/1 MB/s Interim Satellite Service (ISS) was replaced, with the new Ka band 25/5MB/s Sky Muster service. John selected a Sky Muster plan that was similar in cost to his ISS plan. It was **half the ISS quota** he had enjoyed at only **30GB per month**. Since inception, Sky Muster has been less reliable (orders of magnitude) by comparison with the nbn ISS. Apart from what now appears to be endemic technical failures, Sky Muster's sensitivity to droplet attenuation (rain fade) is a significant problem. When available or not suffering degradation; Sky Muster does support an adequate quality VoIP service albeit with unsatisfactory geo-stationary satellite delay. John uses VoIP as a secondary service, knowing that his reliable and secure land line is always available in emergencies.

Frustrated by the frequent Sky muster service failures John decided to accurately record the effects of a typical rain event on his service. Modest rain events are frequent on the Mid North coast of NSW and may occur at any time of the year. John lives in a relatively high storm affected area. John captured a screenshot of the nbn ViaSat S-NTD's Graphical User Interface, to identify the Rx SNR during normal conditions. Rx SNR identifies the relative level of the signal received from space by his dish on the roof. It was recorded on the afternoon of 19<sup>th</sup> January 2017, during a period of dull overcast with light drizzle. These conditions have minimal impact on Ka Band signal level.



The screen capture shows the Rx SNR at **17.1dB** which is a healthy level for these conditions. It identifies that the dish is adequately aligned for his location. John's service is provided by **Sky Muster Beam 34** (Forster Beam) which is serviced by the **Kalgoorlie Earth Station** in Western Australia.

On Wednesday evening 18<sup>th</sup> January 2017, at around 7.00pm claps of thunder announced an approaching storm. A screenshot of the storm was taken at around 8:52 pm after internet activity was briefly restored.

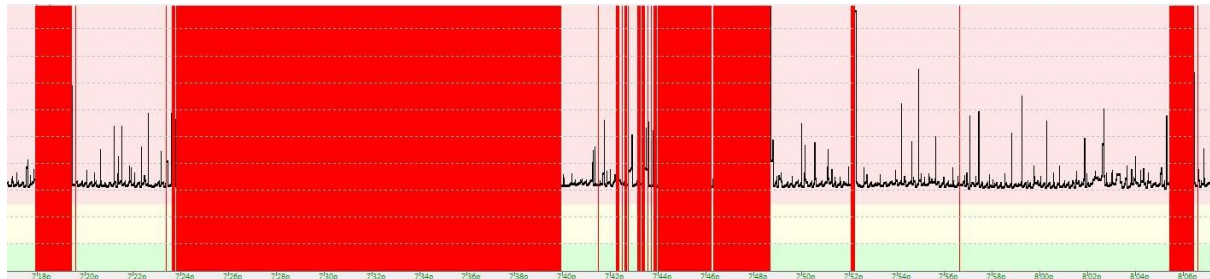


Storm image from the Bureau of Meteorology 128Km Radar located at Williamstown, NSW.



John's home is to the south west of Gloucester and is identified by the purple dot. The rain event moved from the south west to the north east. It was a relatively trivial atmospheric event and the total rainfall recorded after the storm had passed, was just 12mm.

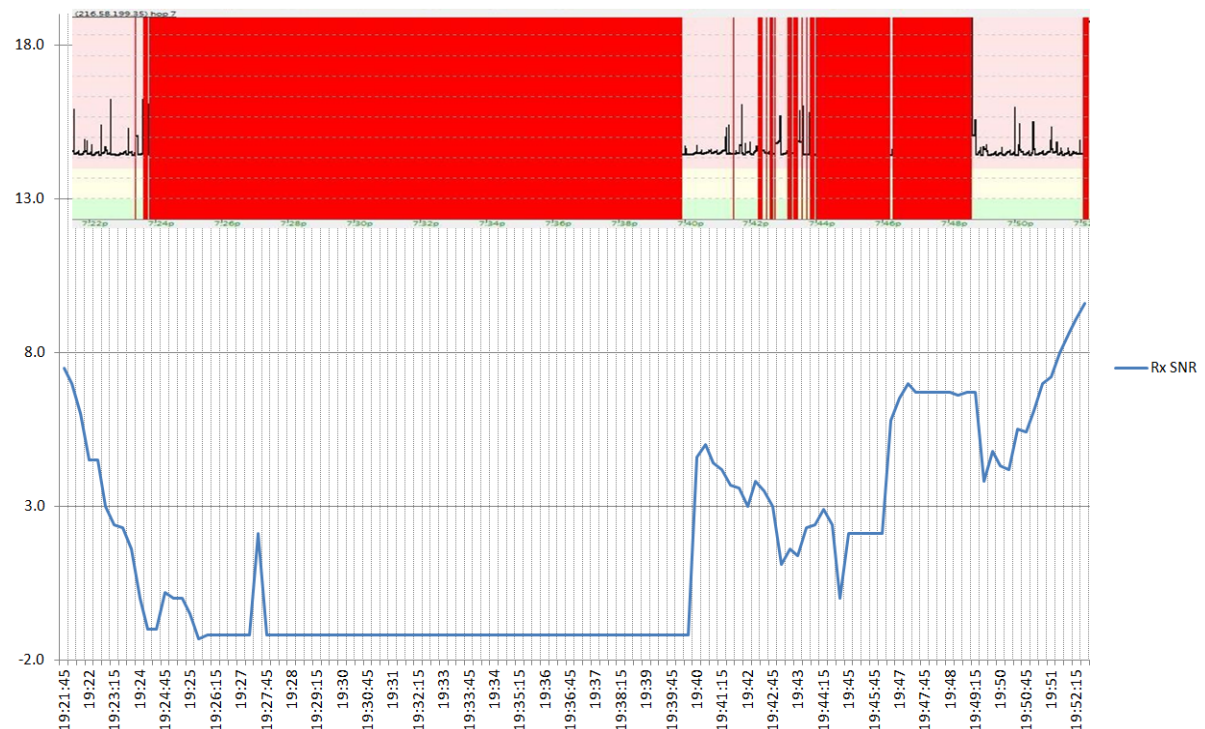
However the effect of the event on John's Sky Muster service was significant. An image of the continuous ping that was operating as the storm passed is shown below. Red bars indicate periods of no service.



*PingPlotter chart of service outages*

John's service was effectively unavailable from **7:18pm** until **8:06pm**, when the last of the heaviest rain moved off. Whilst the period of interruption was not continuous (as is often the case), **a voice call would not have been possible during that period due to the risk of imminent disconnection**, when the service failed yet again. The service failed later in the evening; however that event is not recorded.

**S-NTD Measured Rx SNR during rainfall vs Packet Loss (red)**



*Table 1 - Chart showing Rs SNR versus Packet loss over time*

During the rain event, the ViaSat S-NTD's Rx SNR was monitored at 15 second intervals to determine the correlation between SNR levels and any loss of service. When the satellite

connection is lost, S-NTD access is not available and the Rx SNR cannot update. As a consequence there are periods where the S-NTD Rx SNR value is 'frozen'.

The Rx SNR dropped rapidly as the storm approached. The first loss of internet occurred just prior to 7:24pm. An Rx SNR of less than around +2dB appeared to roughly coincide with the failure of John's Sky Muster service. In the latter stages of the event this correlation is a little less evident as the S-NTD is 'frozen' at higher Rx SNR values. At 7:49pm the Rx SNR finally climbed above +3dB and service is briefly restored, before once again failing at 7:52pm. Whilst John's service exhibits a significant noise margin of approximately 17dB – 2dB = **+15dB**; this is clearly insufficient to cope with even a modest rain event, which delivered just 12mm of rain.

Anecdotally during this period the Australian Open was streaming live via the Ku band VAST Satellite Television Service. VAST suffered a few short outages during the heaviest rain periods, but unlike Sky Muster, it was up much more than it was down. Unlike a voice service over nbn internet; VAST is not an essential service.

### Typical rain events reported on Whirlpool

Jaelle	Just had a storm (18/01/2017), and SkyMuster as usual conked out. However, it came back automatically well before the storm was over. Strange.
JDNSW41	Earlier this evening a storm passed to the north of us, and SkyMuster died for about five minutes. Only about the second time this has happened in the eight and a half months I've had it. Pretty big storm by the look of the radar, but we only got a few drops here.
Rayvsq	<p>Over the last couple of weeks we have had decent rain just about every afternoon and evenings.</p> <p>As soon as it starts to rain Sky Muster goes down (figuratively speaking that is). Depending on how heavy the rain is determines how long it is down.</p> <p>I do have to say that not all rain causes the drop out. It seems to be a combination of very heavy cloud cover to the north/north east (basically in the path of the satellite) and rain.</p> <p>I have found if the cloud cover is to the east, west and south and there is rain we don't have much problem – unless it is very heavy rainfall.</p> <p>The Sky Muster system is not as robust in wet weather compared to the Ipstar ISS.</p> <p>Yes given enough cloud cover and rain no satellite is immune to drop-outs, but Sky Muster has a little less grunt compared to the previous system.</p> <p>I never thought I would say that the Ipstar service would out perform Sky Muster – but in this case it does.</p>

## Appendix C – Availability

“Availability is usually expressed as a percentage of uptime in a given year. The following table shows the downtime that will be allowed for a particular percentage of availability, presuming that the system is required to operate continuously. Service level agreements often refer to monthly downtime or availability in order to calculate service credits to match monthly billing cycles. The following table shows the translation from a given availability percentage to the corresponding amount of time a system would be unavailable.”

(Wikipedia 2016)

Availability % ⇄	Downtime per year ⇄	Downtime per month ⇄	Downtime per week ⇄	Downtime per day ⇄
<b>90% ("one nine")</b>	<b>36.5 days</b>	<b>72 hours</b>	<b>16.8 hours</b>	<b>2.4 hours</b>
95%	18.25 days	36 hours	8.4 hours	1.2 hours
97%	10.96 days	21.6 hours	5.04 hours	43.2 minutes
98%	7.30 days	14.4 hours	3.36 hours	28.8 minutes
<b>99% ("two nines")</b>	<b>3.65 days</b>	<b>7.20 hours</b>	<b>1.68 hours</b>	<b>14.4 minutes</b>
99.5%	1.83 days	3.60 hours	50.4 minutes	7.2 minutes
99.8%	17.52 hours	86.23 minutes	20.16 minutes	2.88 minutes
<b>99.9% ("three nines")</b>	<b>8.76 hours</b>	<b>43.8 minutes</b>	<b>10.1 minutes</b>	<b>1.44 minutes</b>
99.95%	4.38 hours	21.56 minutes	5.04 minutes	43.2 seconds
<b>99.99% ("four nines")</b>	<b>52.56 minutes</b>	<b>4.38 minutes</b>	<b>1.01 minutes</b>	<b>8.66 seconds</b>
99.995%	26.28 minutes	2.16 minutes	30.24 seconds	4.32 seconds
<b>99.999% ("five nines")</b>	<b>5.26 minutes</b>	<b>25.9 seconds</b>	<b>6.05 seconds</b>	<b>864.3 milliseconds</b>
<b>99.9999% ("six nines")</b>	<b>31.5 seconds</b>	<b>2.59 seconds</b>	<b>604.8 milliseconds</b>	<b>86.4 milliseconds</b>
<b>99.99999% ("seven nines")</b>	<b>3.15 seconds</b>	<b>262.97 milliseconds</b>	<b>60.48 milliseconds</b>	<b>8.64 milliseconds</b>
<b>99.999999% ("eight nines")</b>	<b>315.569 milliseconds</b>	<b>26.297 milliseconds</b>	<b>6.048 milliseconds</b>	<b>0.864 milliseconds</b>
<b>99.9999999% ("nine nines")</b>	<b>31.5569 milliseconds</b>	<b>2.6297 milliseconds</b>	<b>0.6048 milliseconds</b>	<b>0.0864 milliseconds</b>

## **Appendix D – Terms and Abbreviations**

<b>TERM</b>	<b>MEANING</b>
<b>ABG</b>	Australian Broadband Guarantee - satellite service closed to new subscribers in 2011
<b>ABS</b>	Australian Bureau of Statistics
<b>ACMA</b>	Australian Communication and Media Authority
<b>ACCAN</b>	Australian Communications Consumer Action Network
<b>ADSL</b>	Asymmetric digital subscriber line - A compression technology that supports high-speed digital services over conventional copper telephone lines.
<b>ATA</b>	Analogue Telephone Adapter - necessary equipment for a VoIP service if a legacy analogue phone is used
<b>ATO</b>	Australian Taxation Office
<b>AVC</b>	Access Virtual Circuit - the bandwidth acquired by RSPs which can be allocated to end-user premises. The AVC is a virtual point to point connection from nbn's network boundary associated with end-user premises back to the POI.
<b>B4RN</b>	Broadband 4 the Rural North
<b>BER</b>	Bit Error Rate - the number of bit errors per unit time.
<b>BIRRR</b>	Better Internet for Rural, Regional & Remote Australia
<b>Broadband</b>	High-speed internet access that is always on and transmits data faster than dial-up access. Broadband is implemented through a range of technologies such as fibre-optic cable, DSL, HFC, mobile wireless, fixed wireless and satellite.
<b>CAN</b>	Customer Access Network - The 'last mile' of a telecommunications network which connects end users to that network.
<b>CCO</b>	Copper Continuity Obligation - An obligation under the TUSOP Agreement which requires Telstra to continue to maintain and operate its existing copper network in areas outside nbn's fixed-line footprint for the provision of voice services until 2032.
<b>CODEC</b>	A codec is a device or computer program for encoding or decoding a digital data stream or signal.
<b>CPE</b>	Customer Premise Equipment - any equipment which is the property of the network operator and located on the customer premises

<b>CSG</b>	Customer Service Guarantee - Under the CSG, carriage service providers (CSPs) are required to meet performance standards and provide customers with financial compensation when these standards are not met.
<b>CSP</b>	Carriage Service Provider - use a telecommunications network to provide telecommunication services to the public. -
<b>CVC</b>	Connectivity Virtual Circuit - is a virtual charge imposed by nbn to service providers to connect traffic from the nbn network to the service provider network.
<b>DRCS</b>	Digital Radio Concentrator System – a digital wireless system that delivers standard subscriber services, in a large area with very low subscriber density. De-Commissioned.
<b>FTTN</b>	Fibre to the Node - A network where fibre is deployed from the Point of Interconnection (POI) to street cabinets (nodes) which are close to end users. Copper lines then carry the signal from the node to the premises.
<b>FTTP</b>	Fibre to the Premise - A network where fibre is deployed from the Point of Interconnection (POI) to the individual premises. It is also called Fibre to the Home (FTTH)..
<b>FTTdp</b>	Fibre to the distribution point - A network where fibre is deployed from the point of interconnection (POI) to the fibre to copper converter (one converter per household) in the street outside each property. A short run of copper then carries the signal to the premises.
<b>FUP</b>	Fair User Policy – An nbn policy instrument that ensures that its access network is not overloaded.
<b>FW</b>	Fixed Wireless - a network design in which network connections are provided through radio signals at fixed locations.
<b>HCRC</b>	High Capacity Radio Concentrator – an upgrade to the Digital Radio Concentrator System (DRCS)
<b>HD</b>	High Definition - commonly refers to an increase in display or visual resolution over a previously used standard
<b>ICPA</b>	Isolated Children's Parents Association - a voluntary, non-profit, apolitical parent body, dedicated to ensuring all rural and remote students have equity of access to a continuing and appropriate education.
<b>IEN</b>	Inter-Exchange Network - switches customer calls through transmission systems to exchanges at Local and Trunk level.
<b>IP</b>	Internet Protocol - the method by which data packets are exchanged over the Internet.
<b>ITU</b>	International Telecommunications Union
<b>ISS</b>	nbn Interim Satellite Service, closed to new subscribers in January 2014
<b>KA &amp; KU band</b>	Bands of the Radio Frequency spectrum reserved for satellite communication

<b>MCF</b>	Mobile Carrier Forum (ACMA) – <a href="http://www.mcf.acma.org.au">www.mcf.acma.org.au</a>
<b>Mbps</b>	Megabits per second. Mbps is used in reference to download and upload speeds.
<b>MTM</b>	Multi Technology Mix – A term which describes the nbn access network which uses a mix of technologies to provide every Australian with access to fast and reliable internet services.
<b>NBN</b>	National Broadband Network
<b>NGWL</b>	Next G Wireless Link - is a remote area fixed mobile wireless service that uses the Telstra Next G (3G) network to provide access to voice and internet services for home or business. It is a complex set up with many variants.
<b>NRHA</b>	National Rural Health Alliance
<b>NSOC</b>	Network and Services Operations Centre – A single centre that provides state of the art nbn™ network monitoring 24 hours a day, 365 days a year.
<b>NTCA</b>	Northern Territory Cattlemen’s Association
<b>NTD</b>	Network Termination Device – for the nbn network this is customer premise equipment (CPE) that is owned and maintained by nbn
<b>OTT</b>	Over-the-Top – refers to a voice service carried over the internet by best efforts.
<b>PC</b>	Productivity Commission - the respondent for this submission.
<b>POI</b>	Point of Interconnect - The point at which a carrier’s network links with telecommunications equipment or facilities not belonging to that network
<b>POTS</b>	Plain Old Telephone Service. a retronym for voice-grade telephone service employing analogue signal transmission over copper loops.
<b>PTSN</b>	Public Switched Telephone Network - The infrastructure for basic telecommunications services (including telephones, switches, local and trunk lines, and exchanges). The operation of the PSTN adheres to the standards created by the ITU-T.
<b>QoS</b>	Quality of Service – standards which define the overall performance of a telephony or computer network with emphasis on the performance seen by the users of the network
<b>RAPAD</b>	The Central Western Queensland Remote Area Planning and Development Board (RAPAD) - a unified local government organisation which aims to assist and facilitate the growth and development of Central West Queensland and wider Outback regions.
<b>RSP</b>	Retail Service Provider - An entity that provides telecommunications services to end users and has a direct customer relationship with end users.
<b>RRR</b>	Rural, Regional and Remote – An acronym for rural, regional and remote Australia.
<b>RTIRC</b>	Regional Telecommunications Independent Review Committee

<b>Rx SNR</b>	Receive Signal to Noise Ratio - the average in separation from the signal to the noise, measured in decibels (dB)
<b>Satellite</b>	An artificial object which has been intentionally placed into orbit. The context in this document is a communications geo-stationary satellite.
<b>SMOF</b>	Single Mode Optical Fibre - is glass fibre that allows only one mode of light to propagate.
<b>S-NTD</b>	Satellite Network Termination Device – the nbn customer premise equipment for the nbn Sky Muster network
<b>SWING</b>	Subscriber Wireless Network Gateway
<b>SZU</b>	Standard Zone Units – a charging system used by Telstra based on charging zones or areas
<b>TC-1</b>	Traffic Class One – the highest priority internet bandwidth reserved for voice traffic
<b>TC-4</b>	Traffic Class Four – the lowest priority internet bandwidth reserved for best effort traffic
<b>TCER</b>	Total Character Error Rate
<b>TCP</b>	Transmission Control Protocol - one of the main protocols of the Internet protocol suite
<b>TCRN</b>	<p>RRR Landlines that aren't copper are referred to as Telstra Customer Radio Network (TCRN) and this includes the following services:</p> <ul style="list-style-type: none"> <li>* DRCS - Digital Radio Concentrator Systems (Now De-Commissioned)</li> <li>* HCRC ( High Capacity Radio Concentrator) (replacement for DRCS)</li> <li>* SWING (Subscriber Wireless Network Gateway)</li> <li>* NGWL (Next G Wireless Loop)</li> <li>* USO Satellite Landline - where there are no towers and landline is supplied by geostationary satellite designed specifically for voice only.</li> </ul>
<b>TIO</b>	Telecommunication Industry Ombudsman
<b>TUSO</b>	Telecommunications Universal Service Obligation
<b>TUSOP</b>	Telstra USO Performance Agreement
<b>TTY</b>	Teletypewriter is a special type of phone. It is the most common piece of equipment used by NRS users. It is a phone with a keyboard where you can type your side of the message, and a small display screen where you can read what the other person has said to you.
<b>UDP</b>	User Datagram Protocol is an alternative communications protocol to Transmission Control Protocol (TCP) used primarily for establishing low-latency and loss tolerating connections between applications on the Internet
<b>UIP</b>	Universal Service Infrastructure Provider
<b>USO</b>	Universal Service Obligation
<b>VDSL</b>	Vertical Deflection Supplementary Listing - A compression technology that supports high-speed digital services over conventional copper telephone lines.



<b>VOIP</b>	Voice Over Internet Protocol - is a methodology for the delivery of voice communications over Internet Protocol (IP) networks, such as the Internet.
<b>VoLTE</b>	Voice over Long Term Evolution - the protocol which carries voice traffic on 4G (and later) mobile networks.
<b>VoWIFI</b>	Voice over WIFI – describes the use of a smart phone to provide voice communication over a WIFI connection.
<b>VPN</b>	Virtual Private Network - extends a private network across a public network, such as the Internet.
<b>VSAT</b>	Very Small Aperture Terminal - a small two-way satellite ground station that provides customer services such as voice, video or internet.
<b>VSP</b>	Voice Service Provider – a provider of voice over IP services

## Appendix E - Sky Muster Plans – Limited data and high costs

The Sky Muster Fair Use Policy is draconian.

[http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-fair-use-policy\\_20160407.pdf](http://www.nbnco.com.au/content/dam/nbnco2/documents/sfaa-wba2-product-catalogue-fair-use-policy_20160407.pdf)

### 2.3 Additional Fair Use thresholds for NEBS supplied by means of the NBN Co Satellite Network

- (a) Without limiting section 2.1(b), Customer must limit usage of each NEBS AVC TC-4 supplied by means of the NBN Co Satellite Network as follows (except in respect of Public Interest Premises, to the extent that NBN Co waives this obligation under section 2.5(b)):

Associated CVC Class	Download usage averaged across AVCs during Peak Periods (GB)	Upload usage averaged across AVCs during Peak Periods (GB)	Maximum usage by each AVC during Peak Periods (GB)	Maximum usage by each AVC in total (GB)
0	30	5	75	150
1	35	6	100	150
2	40	7	150	150

nbn<sup>TM</sup> co's Fair Use Policy applies to each Sky Muster provider:

- nbn<sup>TM</sup> requires each customer to limit their Data Usage to no more than 150GB in any four week period.
- Furthermore, nbn<sup>TM</sup> requires each customer to limit their *Peak Hour* Data Usage to no more than 75GB in any four week period.
- nbn<sup>TM</sup> requires all RSPs to limit their average customer Peak Hour Data Usage to no more than **30 GB** of downloads and no more than **5 GB** of uploads in any four week period.

As a result of this policy, Plans with smaller data allowances represent better much value than Plans with larger ones.

## 'Sweet Spot' Sky Muster plans

### 30Gb Sky Muster Plan Comparison

'30GB Plans' - 25/5 Sky Muster Provider Plans				
Provider	Peak GB	Off Peak GB	Cost/ Peak	Total Cost/
Activ8me				
Ant Com	30	50	\$1.67	\$49.95
Bordernet	30	50	\$1.67	\$50.00
Clear Broadband				
Harbour ISP	30	35	\$1.67	\$50.00
IPSTAR	30	60	\$1.67	\$50.00
Iinet *				
Westnet *				
Reachnet	30	30	\$1.63	\$49.00
SkyMesh	30	30	\$1.67	\$49.95
Average GB / Cost	30.0	42.5	\$1.66	\$49.82

\* 24 Month Contract, or \$99.99 activation fee no lock-in

### 40GB Sky Muster Plan Comparison

'40GB plans' - 25/5 Sky Muster Provider Plans				
Provider	Peak GB	Off Peak GB	Cost/ Peak	Total Cost/
Activ8me	40	60	\$1.75	\$69.95
Ant Com	40	60	\$1.75	\$69.95
Bordernet	40	70	\$1.88	\$75.00
Clear Broadband	40	60	\$1.62	\$64.95
Harbour ISP	40	60	\$1.88	\$75.00
IPSTAR	40	70	\$1.75	\$70.00
Iinet *	40	80	\$1.37	\$54.99
Westnet *	40	80	\$1.37	\$54.99
Reachnet	40	60	\$1.85	\$74.00
SkyMesh	40	55	\$1.87	\$74.95
Average GB / Cost	40.0	65.5	\$1.71	\$68.38

\* 24 Month Contract, or \$99.99 activation fee no lock-in

## Maximum Sky Muster Plans

Maximum 25/5 Sky Muster Provider Plans				
Provider	Peak GB	Off Peak GB	\$ / Peak GB	Total \$ / Month
Ant Com	70	80	\$2.93	\$204.95
Harbour ISP	65	85	\$3.08	\$200.00
SkyMesh	60	90	\$3.33	\$199.95
IPSTAR	60	85	\$2.50	\$150.00
Reachnet	60	85	\$2.42	\$145.00
Clear Broadband	60	90	\$2.42	\$144.95
Bordernet	50	90	\$2.50	\$125.00
Activ8me	50	80	\$2.40	\$119.95
linet *	40	80	\$1.37	\$54.99
Westnet *	40	80	\$1.37	\$54.99
Average GB / Cost	55.5	84.5	\$2.43	\$139.98

\* 24 Month Contract, or \$99.99 activation fee no lock-in

Note: The cost for the maximum plan data on Sky Muster is exorbitant. 60-70GB is insufficient for a family or business.

#### Minimum Cost Sky Muster Plans

Minimum Cost 12/1 Sky Muster Provider Plans				
Provider	Peak GB	Off Peak GB	\$ / Peak GB	Total \$ / Month
Activ8me	5	50	\$6.99	\$34.95
Ant Com	5	50	\$6.59	\$32.95
Bordernet	5	15	\$7.00	\$35.00
Clear Broadband	10	10	\$2.50	\$24.95
Harbour ISP	5	10	\$7.00	\$35.00
linet *	20	40	\$2.00	\$39.99
IPSTAR	10	10	\$3.50	\$35.00
Reachnet	5	12	\$6.80	\$34.00
SkyMesh	5	5	\$6.99	\$34.95
Westnet *	20	40	\$2.00	\$39.99
Average GB / Cost	9	24.2	\$5.14	\$34.68

\* 24 Month Contract, or \$99.99 activation fee no lock-in

## Appendix F – Sky Muster Installation difficulties

BIRRR Member Michelle

Sky Muster installation FAIL! Oh help!!

Our 'service' provider is Ant Communications.

In early November, I arranged through Ant to have Sky Muster installed.

They picked the installation date of 12th of January, which I agreed to.

A technician phoned the week before to see if I could change my installation date to the very next day, which I was unable to do as I had prior commitments.

On the 12th I stayed home specifically because the installer was supposed to come ... but they never showed up. No phone call. No email.

I phoned Ant on the 13th. Waited on hold for 20 minutes & left a message.

A different technician phoned late on the afternoon on the 16th. My 6 year old answered the phone & muddled the message, as 6 year olds do.

6:30 am on 17th the technician phones to say he'll be on site within the hour. !

On his advice, I emailed Ant straight away to make sure they knew the install was happening today.

He installed it, did some test & told that it was working but waiting for Ant to turn their end on & it should be working within 2 hours.

I had heard about others having trouble with the power cycle reset process so I asked him to show me how to do it properly..... and he told me it was a "completely fictional load of rot that doesn't do anything" !?!

... 4 hours later it's still not working, so I phoned Ant (again) ... and they claimed to know nothing about the install at all & as they would have to issue a new work order it will take up to 48 hours to switch it on !!!

.... more than 48 hours later ... still not working .. phoned Ant 3 times that day. Always on hold for at least 20 minutes then put to answering machine. Left 3 messages.

.... Friday morning received a "courtesy call" from a totally clueless Ant operator to see how I was "enjoying" my new Sky Muster!!

She told me to do the power cycling rubbish, which I've done about 7 times now, resulting in a lot of wasted time but still no internet.

Phoned the nbn™ co. They told me to phone the installation company. Phone the installation company. They told me to phone the service provider. Phoned the service provider, who told me to phone the nbn™ !!

... I go to town today, & as I come into service my mobile phone starts going crazy with messages from nbn™ & technicians!!

Totally useless ... if I lived in a mobile coverage area, obviously I wouldn't be trying to connect to Sky Muster!!

... good luck trying to run a business in regional Australia. ...

If anyone has any suggestions how to get this silly thing working, it would be hugely appreciated.

My home phone number 07 XXXX XXXX (unless it's cloudy for 3 days, the that that will go out too), otherwise I will back into service area on Monday.

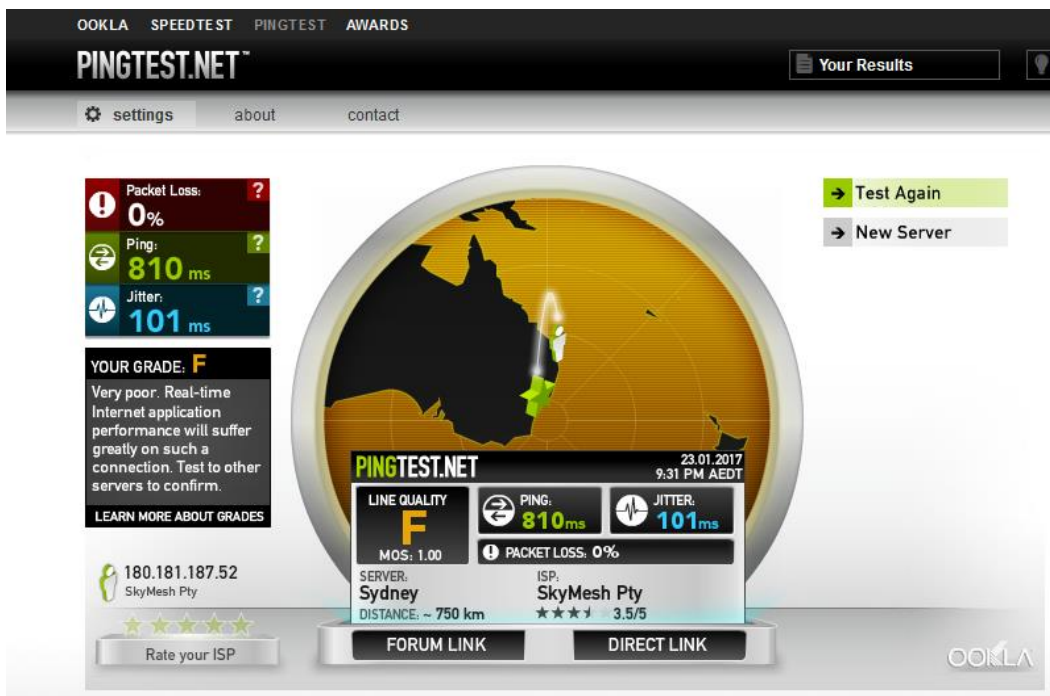
## Appendix G – Jitter

The following test via [www.pingtest.net/index.php](http://www.pingtest.net/index.php) shows a good jitter test over Sky Mesh.



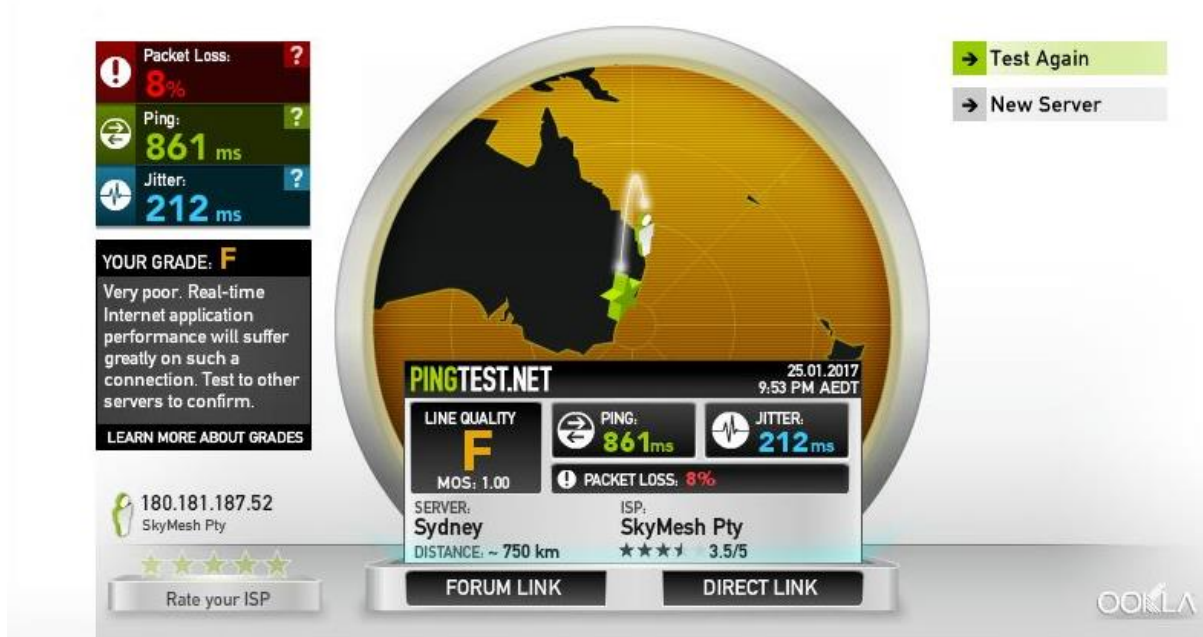
The ping time is reasonable at 686ms, there is no packet loss and the jitter is low. A VoIP call and the internet browsing experience will be as good as it gets on Sky Muster.

The next pingtest identifies that Sky muster is 'on the edge'.



The latency is higher at 810ms and the jitter is now 101ms. The quality of internet browsing and even VoIP calls should still be acceptable.

The following pingtest shows a time when Sky Muster is performing very poorly.



The latency is higher at 861ms, the jitter is very high at 212ms and there is now packet loss.

Sky Muster browsing will be very poor and VoIP calls may be unintelligible.

Note: The tests above were taken at various times on various Sky Muster services.



## Appendix H - Identification of Sky Muster Service Degradation using PingPlotter

PingPlotter <https://www.pingplotter.com/> is an easy to use PC based software that provides powerful proof of network problems and faults. Ping is a computer network administration software utility used to test the reachability of a host on an Internet Protocol (IP) network. It measures the round-trip time for messages sent from the originating host to a destination network element that 'echoes' the ping back to the source. PingPlotter generates a cyclic ping (user determined interval) to a chosen network destination. The destination echoes the ping and network round trip latencies are recorded.

PingPlotter measures the time taken for the ping to return (the network latency) and also records the number of packets lost (packet loss) ie packets that have been sent where there is no response. Lost packets are unacceptable and cause enormous user frustration as the internet slows to a crawl more so on high latency connections. Packet loss is a grave network fault situation, which is frequently the result of network overload (too many customers using a limited resource) or network fault. A working internet service should have very few red packet loss spikes.

Due to the fundamental distributed design of the nbn 121 POI network; it is poorly protected against intentional, malicious or unintentional (fault) capacity overload.

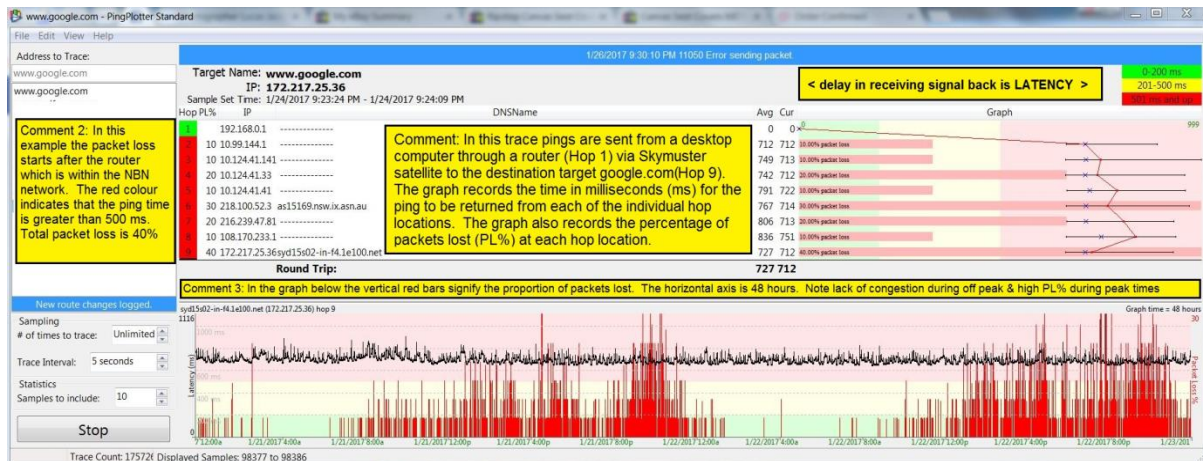
Capacity overload may occur within the:

- shared customer elements of the nbn network
- provider's back-haul network capacity and protection
- provider's physical network
- capacity and protection of the provider's connection to the various essential elements of the World Wide Web including VoIP.

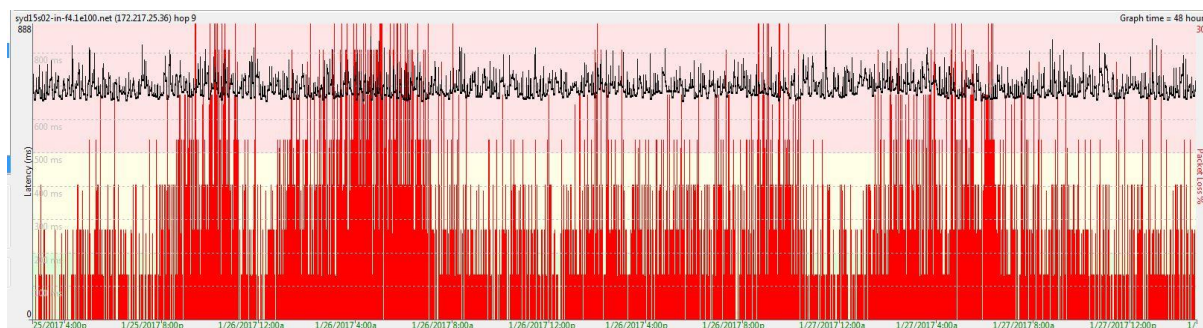
The nbn network and provider delivery mechanisms are so far removed from the standards that must apply to a carrier grade service, that no meaningful comparison is possible.

In the example below a Sky Muster end user has captured a period of what seems to be network contention (or congestion). PingPlotter records the latency at each network element in the path to the destination; which in the case below is [www.google.com](http://www.google.com). Hop 2 in the plot is the first network element after the satellite segment of the circuit and the *average latency* for this element is 712ms.

In the chart below it can be seen that packet loss is occurring on consecutive days (21/1/2017 to 23/1/2017) and well into the evening. The only period of zero packet loss is during off peak times between 1.00am and 7.00am; when no one is using Sky Muster. Packet losses of up to 40% are evident, which is an atrocious level of packet loss. The ping interval is five seconds.



The next screen capture is from another Sky Muster user also using ping plotter. It identifies severe and continued packet loss, day and night for the period 25/1/2017 to 27/1/2015.



Unacceptably high and extensive periods of packet loss appear to be an endemic problem for Sky Muster users.

Sky Muster packet loss may occur for any user, at any time of day or night.

## Appendix I – Essential equipment minimum cost of VoIP on Sky muster

### Typical essential Sky Muster VoIP equipment

The diagram below identifies the minimum Sky muster equipment that is necessary for a



working Sky Muster VoIP service.

It shows a Netcomm Wireless NF5 router. This VoIP WIFI router provides a VoIP connection to an analogue phone or analogue cordless phone. The typical one off equipment only cost for a provider supplied NetComm NF5 Wireless N Router with VoIP is \$105.00 (SkyMesh hardware cost) or for a more powerful router and WIFI, a Netcomm NF13ACV Wireless AC1200 with VoIP for \$155.00 (SkyMesh VoIP hardware cost).

The analogue phone or cordless phone is extra.

Note: A cordless handset system is essential as any landline based service with household wiring supporting multiple phone outlets will no longer be serviceable.

If there is a domestic power outage; the phone service fails.

### Typical minimum Sky Muster VoIP plan cost (SkyMesh)

Phone Handset not included

SkyMesh Sky Muster Monthly VoIP/internet plan

NBN- SA- 5- 5 – **5GB Peak** and 5GB Off-Peak - **\$34.95** per month.

NBN- SA- 15- 15 – **15GB Peak** and 15GB Off-Peak - **\$39.95** per month.

VoIP Plan - **\$10.00** per month (plus call charges)

The minimum cost for a VoIP service with SkyMesh on Sky Muster is **\$44.95** (per month) + call costs. With only 5GB of peak data available on this plan, it would be inadvisable to connect any internet devices to this service, as the data quota is just sufficient to support the voice service. A service with additional internet data is available for **\$49.95** (per month) + call costs

SkyMesh will assign a phone number that is local to your location. When people from your local area call you, it will be a local call for them. The \$10 VoIP fee is charged monthly in advance and any accumulated call charges are billed at the end of the month.

**Call Charges:**

<i>Local &amp; National Landlines</i>	<i>1800</i>	<i>13/1300</i>	<i>Australian Mobiles</i>	<i>International</i>
<i>10¢ untimed</i>	<i>Free</i>	<i>25¢ untimed</i>	<i>30¢ per minute or part thereof</i>	<i>From 1¢ per minute</i>

Calls to 1223 cost 75¢ per call.

Calls to 190 Premium services are not available.

**One off initial service/equipment costs**

- NetComm NF5 Wireless N Router with VoIP – **\$105.00**
- Netcomm NF13ACV Wireless AC1200 with VoIP – **\$155.00**

Note: You must supply a standard telephone handset or cordless phone.

## Appendix J – Northern Territory Cattlemen’s Association Member Feedback on Sky Muster



### NORTHERN TERRITORY CATTLEMEN’S ASSOCIATION INC.

Advancing and protecting the interests of cattle producers in the Northern Territory

*Member - National Farmers' Federation & Cattle Council of Australia*

Suite 9, 1 Floor, Raffles Plaza, 1 Buffalo Court, Darwin NT 0800 | GPO Box 4845, Darwin NT 0801  
T: (08) 8981 5976 | F: (08) 8981 9527 | E: [office.darwin@ntca.org.au](mailto:office.darwin@ntca.org.au) | W: [www.ntca.org.au](http://www.ntca.org.au)

To whom it may concern.

- The NTCA recently requested feedback from members regarding the NBN Sky Muster.

Please see below a sample of the feedback received by the NTCA in response to the request. I am writing in response to email seeking feedback regarding the NBN rollout and installations.

Member Issues:

#### MEMBER 1

Active8 is our provider.

Member 1 has 6 internet services on the station, these services – office, schoolroom, 3 homes, and staff TV room/staff quarters. Total of up to 40 people.

All services were booked for upgrades with the new NBN – this process carried on throughout 2016.

The communication from the point of lodgement with Active8 and in turn the NBN and then with the installer Hills has been very poor. The NBN corresponds and representatives are very confused by our address, physical location, and multiple services. We are constantly contacting them to clear and follow up on them being confused about booking installs. We constantly update our information with them and clear the confusion only to have it happen again.

The education package for the schoolroom was lodged 14/6/2016 and it has still not been installed.

Installation issues –

\* We finally got to the point where some installations were made mid-2016. For this we were very grateful.

\* However we had an installer come to the station in late 2016 to complete installations. He then left the station without completing the installs stating it was too hot and a number of other excuses. We offered to provide labour and any machinery necessary to complete the task, which would mean he would not have to come back (therefore waste money). He refused and left the station.

\* Since that day we have contacted the NBN and Hills on a number of documented occasions by phone and email asking when the installs would be re-booked and that one was the education package. We were told we would be contacted. Finally we started to

receive emails regarding the installations being booked for January. I had already advised the above bodies on numerous occasions that there would be no road access from late December until as late as April 2017. This they chose to ignore and keep sending us install dates for January 2017. To make matters worse the installation company keeps phoning the managers mobile phone (which does not work on the station) to confirm installation times. We have contacted the above bodies more than ten times asking them not to use the mobile and giving them landline numbers to use.

**\* All we want is a fair service that any other Australian can access. For our children to be able to complete their schooling with suitable internet. Nothing more.**

## **MEMBER 2**

As an update on how often nbn is out – today at 8.30pm I might have had 20mins of use about 3-4hrs ago. I just rang Keith \*\*\*\*\* to hear that his modem is blue where as ours has been white for most of today – like to know is that how they limit us – cut it out altogether – if so it is very dangerous.

We have 3 connections here, only one has been changed to NBN. Its been brilliant. Much faster, more reliable and only goes out when there's heavy rain briefly. Our only trouble has been with the service provider activ8me who have muddled up the other 2 accounts that need to be upgraded and as i lodged the paperwork back in October I'm pretty disappointed they haven't been installed yet.

Mainly being that my children study distance education and they NEED the connection so they can do their schoolwork.

## **MEMBER 3**

\*\*\*\*\* Station is yet to be connected to the NBN. The installation was scheduled for September last year, however the installers had the wrong coordinates for the homestead and couldn't find the house. The installers were Hills and they kept leaving messages on my mobile, which of course has no reception until I go to town. I explained several times they need to ring and make installation appointments on the fixed line. The house is 4 km off the Victoria Highway and signed posted, not hard to find.

On the 6th December last year, the internet service was turned off to \*\*\*\*\*. My service provider, Activ8 me, told me NBN turned it off. I contacted NBN and they said they are not able to turn it off, Activ8 me had to have turned it off. I don't know who was lying. It took until the 7th January this year to have the internet turned back on. On the 19th January Hills installers left a message on my fixed line message machine to say they would be installing the NBN service on the 2nd February. I returned the message and said all ok to install on that day. They said they would ring and confirm a week before the installation. I haven't heard from them. When the installation does take place, it is important it works efficiently from installation, because as you are aware pastoral businesses are becoming more reliant

on the internet to conduct their daily business. I thank you for my being able to relay my concerns.

#### **MEMBER 4**

Today it has been more or less out for 4 hours – 11am to 3pm – how can one run a business with this sort of service. As well if we are on phone for medical emergency – DMO on call and need to send them a photo – how do we get the photo out with that sort of service? How do we get to order dozer parts when we have to go onto the net and order from a store and need to get it on the bus asap. One night I couldn't even get to pay the super as the internet was out- there are things which have deadlines and we need a lot more sure supply of service than having it out so much. God forbid the phone is out too and we are trying to get an emergency relay call out to someone who can speak to doctor or order something for us

#### **MEMBER 5**

We had NBN installed last June and in all fairness it has worked well. We had a few teething problems with installation but that appears to have sorted itself out. A couple of times we have lost connection but were notified by Activ8 that there was a problem beyond our control otherwise we have disconnected everything and re connected and patiently waited till the blue light came back on!!

#### **MEMBER 6**

NBN Seem to be more download happening than we are using. We aren't using the internet any more than we were before and we burn through 35g faster than when we had 25g. Speed is faster but it doesn't work in storms. When we go over we can only purchase 5g additional. Not acceptable when operating a business.

#### **MEMBER 7**

Ordinary.

#### **MEMBER 8**

Our experience with the NBN includes;

\* Regular outages. Until December 2016 we sometimes experienced up to 3 outages per week, lasting from 5 minutes to all day. We've been away recently so I'm not sure if this pattern has continued through January 2017.



\* Inability to contact the ISP when experiencing a problem. Either the ISP does not answer the phone, or the phone line hangs up before it rings, or some ISP's have a policy of asking you to leave a message and/or terminating the call once you've waited in queue for 10 minutes. When you don't know if the problem is your end or theirs, contacting the ISP is time consuming, frustrating and uncertain.

\* Data usage. We evidently use more data than I think we can account for. I've gone through our device settings, followed the advice, and we are very conscious/conservative in our usage behaviour. I'm baffled how we can use 40G per month.

\* Shaping is awfully slow, which is why using the data before end of month is so scary. Previously, shaping would slow the data speed over several days, under sky muster the speed is immediately and painfully slow.

I appreciate the constant improvements NBN and ISPs are implementing, but our commercial and personal needs of the internet are way in front of these improvements. We waste a lot of our time on problem solving and it's a constant barrier to our business; for example we would like to transition the office to cloud based systems but our experience with sky muster is still too unreliable.

#### **MEMBER 9**

Happy New Year to you and all the staff. Don't talk to us about the internet! The last two months has been woeful. Sometimes good, but mostly horrible. Skybridge have been in touch with us and have partly connected the system here. At the moment they are talking about using a helicopter to complete the work to isolated people.

#### **MEMBER 10**

First 3 days are impressive.....since then..drops out regular , can switch it on, boil kettle, make and eat breakfast, and it still hasn't finished loading weather or whatever at 5 in the morning , thats the polite version...I don't bother anymore.

#### **MEMBER 11**

We found the NBN installation process arduous: they sent out two lots of contractors more than a month apart to install an upgrade on an existing service & install a new service both with Activ8. Seemed like a terrible waste of time & resources.

## MEMBER 12

Now that it's installed we are very happy. Our only unknown is when are existing Telstra satellite services going to be switched over to the new NBN service?

## MEMBER 13

At the end of this email is recent thread from \*\*\*\*\* facebook page when I asked if anyone else having trouble. No faith in Hills at all. Activ8 even thought we had the new Skymuster installation in our quarters and sent congratulatory email. I didn't respond because it was so ludicrous! However realised 3 months later they'd turned the old one off and been also billing for the new plan and installation! Nil usage in my favour in arguing that one. Obviously our staff are very on the ball too ... although it was so useless most of the time one didn't know if it was working or not.

Plenty of guys round here have had 5-7 no-shows. Now they are saying the wet season is making things hard – that is when I went closest to losing it.

They still have not showed up around here. Latest excuse – having trouble getting the gear here! For heaven's sake - We are on highway No 1!

Some \*\*\*\*\* people are obviously not across nbn stuff at all – we can get mobile coverage (only just at \*\*\*\*\* ) but as far as I know everyone round here is entitled to nbn and that satellite is the only way to get it. Is that the case?? The satellite plans are bigger and less expensive and supposedly faster and more reliable haha. Mind you I wouldn't call mobile reliable most of the time either. We use our maximum available download of 50Gb for \$150/mo in less than half a month.

I have had a few people comment to me personally who haven't commented on this thread below. I would think the \*\*\*\*\* farm is a pretty big customer to be mucked around for so long.

Those of us who have had words with Hills have been assigned liaison personnel of some sort who swear to be taking a personal interest in our unacceptable service, but we are still only given the generic phone number and we all seem to have a different person so still no coordination. When I talked to my bloke just before Christmas he said they were still getting quotes to do the ground mounted pole installations – so it seems all the other appointments were complete bullshit. Or the quote business is. To be frank I believe nothing they say anymore.

I put in for 4 services at \*\*\*\*\* . When they were coming to do an installation in Sept or Oct they seemed to be talking one service – so I rang a checked up and they had to scour through their records to find all four and put them together. They were all applied for together at the same time with activ8. Then I never heard from them again for ages ...

Bottom line – their system of collating and filing applications would seem to be pretty sub-standard.

I think involvement of more local blokes would be a big step in the right direction if not being done. At least ask locals about freight truck companies if nothing else!

#### **MEMBER 14**

Hello Zion and the Hills team,  
Thank you for your email.

I have many questions in relation to your email:

1. Why did someone from Hills ring me on Tuesday 13 December to tell me a technician would be coming to install our satellite internet on Thursday 15 December when they obviously weren't?
2. Why, therefore, could you not also ring call me and at least leave a message? I missed one call to my mobile in the last week from a private number and no message was left.
3. Why did Hills tell me the contractor would call me 24 hours and 1 hour before arrival?
4. Why did some of our family travel 500km to be here for the installer?
5. Why did I not receive any contact to say nobody was coming?
6. Why have I been given more than 6 installation dates since my application was accepted in early July?
7. Why is Hill's latest installation date after the Interim Satellite Service has been turned off?
8. Why, on about 2/11/16 did Hills ring me say they would be here on 30 November? And why did I hear nothing when they didn't show up?
9. Why on about 8/12/16 did I have to ring Hills for next installation date?
10. Why did they tell me they would do it in January???
11. Why don't Hills employ local contractors who know the country, the properties and the people who are waiting for Skymuster installations.

Obviously, my confidence in the ability of nbn and Hills to deliver on Skymuster in promised timeframes has been severely eroded.

I have been tolerant to date because we can just get mobile signal in some of our buildings. We are however now facing Christmas with unusable internet, mostly because we were expecting an install before Christmas and stupidly were less frugal than usual with our meagre, limited download. We are also facing an impending wet season, and live in an area impacted by floods, so good communications are critical.

#### **MEMBER 15**

NBN. We've just had the last of our systems changed over to Skymuster. This was supposed to be in two separate visits (which would have made three visits in total), but the rain meant they couldn't get out to Docker River, so did all 5 of ours at once. Which was great and we were really pleased that they were able to make it happen. However, they messed up recording the box numbers against the 'houses' (let's just not even go into the debacle about having to name every building.....) and it has taken about 10 hours of staff time to try and get it sorted. The wrong boxes against the wrong houses, which meant the

wrong usage was potentially to be charged to the wrong person....but we were able to create enough noise for Skymesh to give us a way to sort it out (get all the boxes, and then reallocate correctly) before the changeover of the first month usage. The relationship between NBN and other providers (ours is Skymesh) is pretty ordinary, with both sides always happy to blame the other. The entire process of not being able to link multiple connections to the one visit is just laughable if it wasn't so serious and this appears to be simply how the system was set up and 'no-one' knows how to get around it. The lack of consistency at the other end of the phone - even though we may spend hours documenting what the issues are - there very rarely seems to be a record of it the next time we call. We have not noticed any changes in the speed of the service in the office (and \*\*\*\* and I don't have another one at home) with mixed reports from staff as to whether it's better or not. Certainly still no-where near town access (speed/volume/\$\$ comparisons). We did have drop outs during the rain, which hasn't happened before - but the rain isn't usual either, so not much we can pull out of that. But the internet stays on better than the TV with cloud cover, both pre and post Skymuster.

We have had to put all our staff connections into our name - so that we didn't face the months of delay for someone to switch over to a new user or to turn off when someone left. This was a REAL pain, but we've worked out our way around it, so when a staff member changes, we simply change the credit card details.

## **MEMBER 16**

NBN at \*\*\*\*\*

1. often out when we need to use it
2. slow even when not supposed to be
3. was told it was worked out that everyone was allocated to get 35gig and after that price rises sharply however our office has 4 people working business out it and it just isn't enough. 35gig sounds a lot however I am told that flyers on planes have free unlimited usage as they fly overhead of us. I am told that the poor town people who are flying are used to having unlimited use at home in their cities so they have to have unlimited usage as they fly.
4. Towns already have free access in areas, why are plane passengers allowed to chip in on what we can get?
5. I would also like to know if planes also often have no usage for an hour say 4-5pm like we do as well while it updates etc. Why can't they update at night? Race into the office and have no idea if it is out for 10mins, or 1hour and if it is out for 1hr, did I come into the office in the first or last 5mins so do I sit around and wait or come back later when the same thing can be going on. It is really annoying to race in to do something on line and it is out!

## Appendix K – Provider cases of nbn Fixed Wireless Congestion

nbn™ fixed wireless can experience serious over air and back-haul congestion. This is due to antenna, equipment and other capacity limitations in the nbn network.

Many users on nbn Fixed Wireless are experiencing serious QoS issues and their VoIP service are also suffering

These network issues are not being addressed by nbn as highlighted by senior management at SkyMesh and Aussie Broadband via social media.

*The 'problem' in Ballarat is with Fixed Wireless only, and it's a combination of congestion at the towers and nbn co's backhaul. It affects all RSPs and not just SkyMesh. We've been trying to find out when nbn co will fix the congestion. From memory and third-hand via Support and Systems Engineering, the progress has been roughly as follows.*

*We reported individual speed faults to NSOC and they closed the tickets saying 'no fault found'. We then raised more tickets and complained, so they closed the ticket saying the speed over the radio sector is normal and therefore nothing is wrong. We raised speed faults for every customer on every congested tower and they bulk closed all tickets saying no fault found.*

*We then raised one ticket for one customer and continued to reopen the ticket and complain it shouldn't have been closed. NSOC told us that so long as a customer can get at least 25/5 Mbps at one point during the day (or night) that was acceptable. We disputed that vigorously. They then explained that 25/5 Mbps was (up to) 25 Mbps download and (up to) 5 Mbps upload and we explained that they were thinking of the 50/20 Mbps service.*

*I spoke to an insider late last year and was told confidentially that the towers will be upgraded once the new round of funding comes through in the new year. The new year arrived and none of our customers have future Scheduled Maintenance for their towers at this stage. I raised the issue of funding at a high level within nbn co last Tuesday and was told that they get funding regularly. I was told the funding is not for specific products or projects, it's just for the nbn™ network in general, so it wouldn't be a funding problem. I was asked who told me that and I conveniently couldn't remember.*

*We have now been asked to raise new speed faults with NSOC, which we have done, and forward them as examples, which we have done, and it will be investigated. I'll report more as significant progress comes to hand.*

*Rees, P, Whirlpool, 23/1/17*

User #10787 3784 posts

**Phil Britt**  
**Aussie / Wideband**  
ISP Representative

O.P.

For some time, Aussie Broadband has been trying to get transparency around nbn wireless tower congestion that we know is happening within the nbn network.

There are many examples where customers are suffering peak time performance issues and RSP's like Aussie Broadband struggle to get these acknowledged within the current nbn fault logging procedures. It's only once pushed, and tickets are escalated to senior levels that nbn will acknowledge congestion in certain wireless areas.

Once areas of congestion are identified it usually takes nbn a number of months to add additional capacity to the sectors through overlaying other frequencies and migrating customers to different NTDs.

Aussie is considering building a tool to assist the industry in identifying these areas. My question to you good folk on Whirlpool is, how much information are you prepared to provide to such a tool?

To enable accurate identification of congestion issues we would like to collect the following:

1. Location ID, so basically the full address of the service
2. From the location ID we can identify if it's a nbn wireless service or other technology
3. IP address, so we can identify the RSP
4. Speed test result from an embedded speed test system within the page
5. The plan speed the end user is subscribed to.

We would provide a guarantee not to use the information for any other purpose other than identifying areas of congestion, ie we would not market to those addresses. Having said that our general marketing may hit those addresses from other data sources we hold.

We are also considering a log in system so that people can store their results and look back on the history and gain more information about their area.

Once there is sufficient data in the system, we then plan to make the information public through a heat map style interface overlaid onto Google maps where by we don't identify specific premises but areas of poor speeds.

So my question to you is, would you be prepared to provide accurate address level information when conducting a speed test? If so then we will put time into developing this system.

## Appendix L – NBN Co Ltd Statement of Expectations 24<sup>th</sup> August 2016



### NBN Co Ltd Statement of Expectations 24 August 2016

This Statement of Expectations ('this statement') is issued by Shareholder Ministers of NBN Co Ltd ('nbn' or 'the company'). It replaces previous statements provided to the company and will be updated as required to reflect future decisions by the Government.

The National Broadband Network ('the network') aims to foster productivity and provide a platform for innovation in order to deliver economic and social benefits for all Australians. This statement provides guidance to nbn to help ensure its strategic direction aligns with the Government's objectives for the delivery of the network. This statement provides nbn with flexibility and discretion in operational, technology and network design decisions, within the constraints of the Equity Funding Agreement with the Commonwealth, and the Government's broadband policy objectives (summarised below).

nbn is accountable to the Government as sole shareholder for its performance. In investing in the project on the terms of the Equity Funding Agreement, the Government has regard to whether nbn is achieving the Government's broadband policy objectives and whether the company is acting in a transparent and accountable manner.

#### **Broadband policy objectives**

The Government is committed to completing the network and ensuring that all Australians have access to very fast broadband as soon as possible, at affordable prices, and at least cost to taxpayers. The Government expects the network will provide peak wholesale download data rates (and proportionate upload rates) of at least 25 megabits per second to all premises, and at least 50 megabits per second to 90 per cent of fixed line premises as soon as possible. nbn should ensure that its wholesale services enable retail service providers to supply services that meet the needs of end users.

To achieve these objectives nbn should roll out a multi-technology mix network and build the network in a cost effective way using the technology best matched to each area of Australia. nbn will ensure upgrade paths are available as required.

nbn should pursue these objectives and operate its business on a commercial basis. In doing so nbn should be mindful of the following principles:

- **Rolling out the network:** When planning the rollout, nbn should prioritise locations that are poorly served, to the extent commercially and operationally feasible. During the rollout, nbn should be guided by the following goals: service quality and continuity for consumers; certainty for retail service providers and construction partners; and achievement of rollout objectives as cost-effectively and seamlessly as possible. nbn should apply the Government's new developments policy.
- **Vehicle for market reform:** The Government expects the network to be a wholesale only access network, available to all access seekers, that operates at the lowest practical



level in the network stack. The completion of the network will enable the structural separation of Telstra and a more competitive market for retail broadband and telephony services. nbn should retain optionality for future restructuring or disaggregation.

- **Market environment:** nbn is a commercial entity operating in a market environment and can compete and innovate like other companies in this environment in accordance with legal and policy parameters.
- **Funding:** Taxpayers have made a substantial investment in nbn. The Equity Funding Agreement imposes a cap on the maximum amount of equity funding that will be provided by the Government. nbn needs to remain disciplined in its operations, proactively managing costs to minimise funding requirements and working with the Government to optimise its capital structure.
- **Working with stakeholders:** nbn engages with a number of different stakeholder groups across Australia. The Government expects that the company will engage productively and collaboratively with its stakeholders including Members of Parliament, members of the public, local communities, retail service providers, construction partners and relevant industry bodies. In particular, the company should be engaging proactively with those in regional and remote Australia who have historically been at an access disadvantage. nbn is expected to maintain its high standards in working with communities when exercising any carrier powers and immunities. nbn together with retail service providers should work to ensure a high quality end user experience through the migration and ongoing service periods. This includes working closely with retail service providers to proactively manage any complaints.

### **Transparency, Accountability and Planning**

nbn is a wholly-owned Commonwealth company, bound by the *Corporations Act 2001* and the *Public Governance, Performance and Accountability Act 2013*, that operates at arm's length from the Government. In operating its business, nbn should be mindful of the following principles:

- **Public transparency:** The Government requires a high degree of transparency from nbn in its communication with the public and Parliament. The company should publish online weekly progress reporting of network deployment and active services, release updated construction plans on a regular basis and deliver quarterly management briefings to the public. Additionally, the company should publish information that details how it has addressed the Government's objectives outlined in this statement, on an annual basis.
- **Communicating and managing risks:** The Government expects that nbn will actively manage risk. It should communicate risk to Shareholder Ministers and Departments, and engage closely with them, including by providing monthly progress reports. The Government expects that nbn will continue to strengthen its engagement with Government agencies. This should include security agencies to address security risks related to the network.
- **Business Planning:** nbn is required to undertake a rigorous corporate planning process which aligns with the large investment the Commonwealth has made in the company and the national importance of the project. Corporate planning should be carried out in accordance with nbn's obligations as a Government Business Enterprise, applicable regulatory obligations, and the objectives, directions and guidance given to nbn by Shareholder Ministers. Any information necessary for consideration of these plans (or other network issues) should be available to Shareholder Ministers and Departments.

nbn should promptly disclose to Shareholder Ministers and Departments any material variance from its Corporate Plan assumptions or forecasts, along with other material events. Should nbn become aware that there is a substantial risk that it will be unable to complete the rollout within the parameters set out in either the Corporate Plan or this statement, it should advise Shareholder Ministers and Departments immediately.

## Appendix M: Telstra's position on the future of the USO

# Telstra's position on the future of the USO

As the Productivity Commission reviews the future of the Telecommunications Universal Service Obligation (USO), Telstra will continue to advocate for regional and rural customers.

### Helping meet the needs of regional Australia through the USO

The future of the USO is an important issue for many customers, especially those in regional and remote areas, because at the moment this government policy provides a guarantee that no matter where you live or work, you can get access to a telephone service.

The USO is currently paid for through a mixture of government and industry funding.

Telstra is the largest single contributor of funding to the USO (providing even more funding than the Federal Government) with an annual contribution of around \$140 million.

Telstra is supportive of changes to the USO if they improve the experience for customers, particularly those in rural and remote Australia.

While nbn.co may be able to take on the responsibility of delivering the USO after their network rollout is complete, they are not likely to be in a position to do so at the moment.

There also needs to be careful consideration of relying on nbn co.'s satellite solution, Sky Muster, to deliver the USO's Standard Telephone Service to the most remote locations in Australia.

Our regional customers have expressed concerns regarding the availability and voice quality of the Sky Muster service. We recommend that Telstra, the Government and nbn co. investigate how Sky Muster can be optimised for voice. Once that work is done, the Government should review Sky Muster's suitability for the delivery of the USO.

Any change to the USO must ensure that rural and remote customers continue to have confidence in the availability of a voice service and know that any USO transition will be planned and executed carefully.

### The future of payphones

The USO ensures that everyone has reasonable access on an equitable basis to payphones, regardless of where they live or do business. Telstra currently operates around 17,000 payphones to keep people connected.

We fully support the Productivity Commission's recommendation regarding payphones and we remain open to beginning negotiations with Government.

Removing the current payphone obligation may reduce the funding needed for the USO, creating opportunities for telecommunication providers to make additional investments in their regional infrastructure.

### Listening to regional customers

We'll continue to talk with our customers as well as businesses and organisations across the country about how we can ensure that everyone, no matter where they live or work, can enjoy the benefits of reliable communications.

