

SUBMISSION TO THE REGIONAL TELECOMMUNICATIONS REVIEW 2015

TO: The Chair and Committee of the Regional Telecommunications Review 2015

FROM: Robert Smallwood

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SUMMARY:

It's time to declare nationwide broadband telecommunications networks "*Essential Infrastructure*" alongside water, electricity and roads.

Commonwealth, State and Local Governments have funded a plethora of communications initiatives over the past several decades, yet many regional Australians remain significantly disadvantaged compared to metropolitan counterparts because of substandard or absent broadband infrastructure.

The Commonwealth government's current NBN plan to relegate more than 400,000 Australian residences exclusively to geostationary satellite Internet (into the indefinite future) will only exacerbate the exiting "digital divide" between city and country areas as faster, higher-capacity, higher-performance services become available to metropolitan customers through cellular wireless 4G/5G/LTE services and fibre.

Regional customers face disadvantage and persistent frustration caused not only by inadequate or absent access to broadband, but even when access is available, in many areas issues such as insufficient network backhaul capacity, poor mobile sector capacity, network congestion and frequently unreliable hardware often make using online services impractical or even impossible.

Because of their remoteness from many services (shopping, banking, selling, etc.) regional residents have an even greater need for reliable high-quality broadband access, as they often do not have alternatives for accessing these services in the physical locations that metropolitan residents have.

Further, download/upload quotas on usage of satellite and mobile data that are often an order of magnitude more restrictive (and 20X to 30X more costly compared to services available in metro areas) severely limits what regional customers can do during a given billing period.

To develop digital equity throughout Australia, uniform broadband wholesale pricing and access specifications must be developed and maintained throughout the nation. High-quality regional services should be funded through levies placed on carriers operating in metropolitan regions.

Beyond access issues, persistent network congestion and under-provisioning of both access networks and backhaul capacity are major issues in regions. To ensure that customers can make informed choices when selecting a network provider, network operators and ISPs should be required to publish their network utilisation/congestion statistics by region on a quarterly basis.

Providing Fibre to the Node for the majority of Australia's regions where real-world copper is degraded, damaged, corroded and compromised, is an ineffective approach and can never be a sufficient approach beyond being a stop-gap measure, making its eventual replacement with fibre within 5-10 years imperative and ultimately more costly than necessary over time. A long-term, nationwide Fibre to the Premise initiative where only the most remote residents are served by Fixed Wireless and Satellite should be the ultimate goal of governments at all levels.

THE MAJOR ISSUES/RECOMMENDED SOLUTIONS:

- COVERAGE DOES NOT EQUAL CAPACITY.
Network congestion in regional areas is a constant hindrance to effective use of the Internet. Access alone is not a sufficient measure of digital inclusion. Capacity (i.e., absence of network congestion and low network contention ratios), high speeds and sufficient monthly download quotas on par with metro areas are all also crucial to a digitally-inclusive society.
- ENCOURAGE TRANSPARENCY AMONGST CARRIERS AND SERVICE PROVIDERS.
 - PUBLISH NETWORK CONGESTION STATISTICS.
All Retail Service Providers are not equal -- and this is a major determinant of the quality of service that regional customers receive. Most customers will be unaware of the importance of backhaul capacity acquired by both ISPs and mobile carriers in determining the quality of the Internet service that they receive. The requirement for mobile carriers and ISPs to make publicly available their contention and congestion statistics on all infrastructure on a regional basis would be a significant step forward in creating greater transparency in the industry for customers to make informed choices.
- INFRASTRUCTURE, EDUCATION & IT SUPPORT.
To achieve “digital equity” in regional areas (“regional”=regional towns, remote communities, stations and outback – i.e., everything beyond metro areas) there are three necessary (but not sufficient) pillars that are essential in all cases and require resources and government programs to deliver:
 - Physical communications infrastructure with sufficient capacity and speed along with metro-level quotas with attached Service Level/reliability targets, (not just “best endeavours”);
 - Digital education and training provided at all levels of society, throughout the regions;
 - Availability of IT support to ensure the infrastructure is repaired in a timely fashion, maintained and upgraded and the software supported.
- OFFLOAD TRAFFIC FROM SATELLITE IN EVERY POSSIBLE INSTANCE.
Historical performance of satellite services should lead us to be sceptical of what the NBN LTSS will ultimately deliver and regional areas should prepare accordingly.

The likely scenario that will unfold is:
 - Following the launch of the new NBN satellites in early 2016, customer demand for connection to the new satellite will be immediate and extremely heavy. It is most unlikely that NBN will be capable of meeting the short to immediate-term customer demand for the timely rollout of satellite Customer Premise Equipment to regional customers—NBN anticipates 400,000 premises will eventually be connected to the LTSS—Customer premise equipment installation to all end user sites where there is demand will likely require several years (and probably more) for NBN to deliver, leaving customers who are in the queue for the LTSS with poor service and dependent on the grossly inadequate Interim Satellite service.
 - Unless urgent measures are taken to offload as many customers as possible onto alternative access technologies such as Fixed Wireless or Fibre to the Premise, high customer demand on the LTSS will exceed system capacity as soon as they can be connected; the LTSS will rapidly reach a status of over-subscribed and contended, resulting in permanent poor performance with no upgrade path available;

- Based on current demand growth, heavy usage during the peak evening hours will result in significant time-of-day performance deficits for all LTSS users.
- Maximum monthly download quota limits placed on satellite services will severely limit the ability of business and healthcare applications to deliver metropolitan-grade service levels.
- Insufficient capacity, high throughput demands, long signal transit latency due to geosynchronous transit, fixed-bandwidth spot beams (cannot be dynamically demand-allocated) along with the inability to switch voice and video traffic on the satellite will make video conferencing and VOIP audio calls all but impossible in many if not most circumstances. In areas where LTSS may one day be expected to replace the existing USO-mandated HCRC terrestrial telephone services, satisfactory satellite-to-satellite voice calls may be all but effectively impossible to achieve.
- A “NO DISADVANTAGE” STRATEGY.
A requirement that any new service provided via NBN be of at least the same or better quality as an existing service that is to be removed following NBN rollout. (e.g., removing terrestrial telephone service not to be permitted if satellite voice calls are the only alternative means of telephone calls) If terrestrial services are to be maintained, an upgrade path must be created to replace the end-of-life technology currently in place (and being supported by Telstra) for which spare parts are becoming increasingly difficult to source.
- MAKE COPPER TO FIBRE TRANSITION SEAMLESS AND PAINLESS FOR CUSTOMERS.
More promotion is required in the lead-up to service disconnection of copper services. Customers should be made more aware of their options when existing copper-based services are to be removed. For example, little to no publicity has taken place with regard to how customers can order UNI-V voice services as a proxy for copper line based telephony services.
- A CONCESSION MODEL IS NEEDED FOR REGIONAL MOBILE DATA USERS.
In regional areas more 3G/4G/LTE will become available on the same timetable as the NBN satellite option in more than 500 locations nationwide as the Regional Black Spot program delivers new mobile phone towers. The only real difference between the 4G/LTE technology that mobile carriers deploy for data service carriage and NBN Fixed Wireless is the labels applied to these services and the fact that data on a mobile carrier’s network cost 20X to 30X more than the same data delivered on the NBN Fixed Wireless network.

The current model of separating NBN Fixed Wireless and mobile LTE services onto two hardware platforms and applying vastly different charges in regions is patently absurd. The technology deployed by the NBN for its Fixed Wireless services is virtually identical to the cell technology on mobile towers. Many of these cellular services will have little traffic and plenty of backhaul supply.

For residents in remote areas, in each instance where NBN Fixed Wireless is not co-located with mobile phone towers, a concession model should be developed and adopted by government that reduces the cost of cellular data bandwidth usage to parity with Fixed Wireless/Fixed Line costs to permit customers to use the cellular network as their primary broadband data service instead of requiring NBN to install LTSS satellite. This approach will:

- Improve Internet performance, reduce transit latencies;
- Offload traffic from satellites and subsequently reserve satellite capacity for regions where it is likely to be the last and only resort for broadband access.

- Dramatically reduce need (and many millions of dollars in costs to NBN Co) for additional NBN Fixed Wireless or satellite infrastructure.
- COST-EFFECTIVE SITE SHARING FOR FIXED WIRELESS PROVIDERS.
Investigate the use of existing Telstra towers and NBN Fixed Wireless towers to site share not only with other cellular carriers but also with other private Fixed Wireless providers on an affordable incremental cost-plus basis to extend Fixed Wireless footprints, thereby offloading traffic from NBN satellites and NBN FW in areas where demand exceeds NBN supply.
- PROVIDE SUPPORT FOR REGIONAL COMPETITORS.
In locations where NBN have designated “Satellite-only” areas, provide support for other carriers and service providers who express interest to deliver fixed line and fixed wireless services.

NBN have stated that they have no intention of extending the footprint of their fibre transit network before the completion of the NBN rollout. This will unnecessarily constrain the increasing deployment of Fixed Wireless and Fixed Line in areas where more (privately-owned) fibre becomes available over the next 10 years. Therefore, it is imperative that the government supports a competitive environment than can provide cost-effective alternatives to NBN’s “Technology Choice” program—e.g., development of additional private fibre networks into regional areas that would further extend the reach of Fibre to the Premise, Fibre to the Farm, Fixed Wireless access networks and provide additional backhaul capacity to metropolitan content servers and Internet Exchange points—without the need for these networks to connect via the NBN.

The current NBN “Technology Choice” option will not be affordable for most regional areas, but many local network builders can do this work at a far lower cost, having fewer overheads than NBN. We shouldn’t accept as a given that the NBN is the only cost-effective broadband infrastructure option for all areas.

This approach would further offload LTSS traffic, effectively extending the useful life of the NBN satellites. If NBN will not accept additional capacity provided by new (private) fibre transit networks in regional Australia, the government should provide incentives to assist fibre providers with connecting to other networks, Internet data centres and other content servers, independent of the NBN.

- ENCOURAGE LOCAL COMMUNICATIONS INFRASTRUCTURE CREATION.
Make it easier for farmers and pastoralists to lay their own fibre that can be connected to existing networks. Farmers are especially creative and resourceful when it comes to delivering cost-effective solutions. A national “Fibre Farmer” initiative that permitted Farmers to lay fibre into their premises that could be connected to existing networks where fibre backbones exist would drive a new wave of benefits into the agriculture sector.
- PREPARE FOR CONTINUED EXPONENTIAL GROWTH IN MOBILE DATA DEMANDS.
As reported by Australian regulator ACMA, mobile data traffic grew 52% from mid-2013 to mid-2014 and mobile traffic worldwide is expected to grow six-fold between 2015 and 2019. (Source: Cisco VNI Mobile, 2015). Between 2015 and the completion of the NBN rollout, regional users are likely to require 10X the bandwidth that is available today in metro areas. This data support “Nielsen’s law of bandwidth”, (Similar to Moore’s law of transistors on a computer chip) which has shown that consistently from 1982-present, a high-end user’s bandwidth grows by nearly 50% per year. This data, previously reported for fixed connections, is also accurate for recent mobile data traffic.

To remain internationally competitive, Australia must be prepared to continue to ensure that its policy framework and infrastructure development incentives are appropriately encouraging deployment of sufficient mobile network reach and capacity to support this trend.

- FUND COST-EFFECTIVE ALTERNATE TECHNOLOGIES.
Investigate what funding support could be made available for alternate technologies, not a part of NBN, for extending coverage into remote areas for safety and emergency services (e.g., Centre for Appropriate Technology passive mobile repeaters.)
- INTRODUCE MICROCELLS WITH SATELLITE BACKHAUL.
Explore the viability of deploying cellular microcells using NBN customer satellite terminals in remote areas for backhaul to extend cellular coverage into otherwise economically unviable areas. While this will still be subject to latency delay issues (the same as other satellite voice services) and provide only limited coverage, it will likely provide an acceptable service where is provided that will be better than no service at all.
- ROLL OUT MORE HIGH-SPEED, HIGH-CAPACITY PUBLIC WIFI.
Ubiquitous Free Community WiFi. (where possible, using NBN services for access, including satellite backhaul, where capacity is available) This can be an inexpensive means of delivering more public access to broadband where it is not possible to provide FttP in every home in a regional area.
- EXPLORE NON-TRADITIONAL MEANS OF SOLVING COMMUNICATIONS PROBLEMS.
Explore options for providing technology solutions for safety and emergency services to remote areas of highway as an alternative to mobile phone towers. (e.g., satellite phone hire trials, “Spot GPS Messenger” and Personal Locator Beacons).
- MORE FIBER. MORE FIBRE.
Create a long-term plan for extending fibre backbones deeper into regional areas to incrementally offload traffic from Fixed Wireless and satellite services, thereby extending the viability of these services further into the future.
- PREPARE FOR A MASSIVE GROWTH OF INTERNET SENSORS AND RELATED NETWORK USAGE.
The “Internet of Things” is coming – Initiate a top-level Commonwealth discussion of its likely impact on network capacity/usage and requirements in regional areas (e.g., real-time GPS-oriented farming automation) and consider a plan and a network architecture strategy to mitigate impacts.
- USE BROADBAND TO PUSH HIGHER EDUCATION AND DEGREES INTO THE REGIONS.
Support Australian higher learning institutions in extending and promoting the delivery of cost-effective, degree-granting programs into regional areas and beyond.
- FUND PRIVATE INITIATIVES THAT DELIVER SUSTAINABLE COMMUNITY BENEFITS.
Private initiatives that are often uneconomic to start can be sustainable if assisted by government to launch. Examples would include regional Fixed Wireless networks beyond the NBN fixed wireless footprints; “Fibre to the Farm” services in areas near passing fibre backbones, etc.
- MORE PRIVATE FIBRE.
Encourage farmers, pastoralists, Shires and anyone else who is willing and able to lay their own fibres to do so and provide opportunities for these fibres to be connected into existing networks.
- ASSIST REGIONS IN USING BROADBAND TO UNCOVER, DEVELOP AND MARKET THEIR UNIQUENESSES TO THE WORLD.
The viability of many regional communities is being threatened by the availability of global

access to online shopping and services. To survive, regional communities will need to identify and focus on their uniqueness, develop products and digital services to capture the value of this uniqueness and market both locally and to the rest of the world to generate new sources of income, new jobs and reasons for people to live, work and invest in regional areas. Community-based initiatives to support this transition using high-speed broadband infrastructure will increase the long-term viability and vitality of regional areas.

DISCLAIMER: This submission reflects my personal views and may or may not align with those of my current employer or the parent organisation of my employer and does not constitute an endorsement of these points by my employer.