



The Hon Luke Hartsuyker
Chair
2021 Regional Telecommunications Network Review
Department of Infrastructure, Transport, Regional Development and Communications

Please find attached Kangaroo Valley Broadband Network's (KVBN) submission to the 2021 Regional Telecommunications Network Review

KVBN was established in 2018 with a view to providing a broadband network to Kangaroo Valley, namely as a Wireless Internet Service Provider (WISP). Historically the Valley has been very poorly serviced by major internet providers. For example ADSL covered about 10% of the Valley and the NBN network is even less comprehensive. The satellite service in areas which is not covered by the NBN fibre network has proved a poor substitute. When complete, the network KVBN will cover a geographically challenging area, with a low density population, an environment that is not commercially attractive to large Telcos. I believe it can provide a model for many regional areas that are not, for whatever reason, receiving the benefits provided by the major Telcos

Since it was established KVBN has completed the first of three rollout phases. The concept was proven in this first phase, and at the time of writing 42 residences have been connected and are receiving download and upload speed of over 50Mbps and 30Mbps respectively. This is as good, if not better, than the speeds experienced by most subscribers in major cities.

KVBN could not have evolved to this stage without the assistance of the NSW Government through the Regional Digital Connectivity Program. The attached submission covers the many lessons that have been learned along the way, and proposes solutions as to how many of the obstacles faced by WISPs under the current laws and regulations could be minimised.

In sum, most of the rules and regulations that cover the provision of internet services are designed with only large Telcos in mind. I wonder if there may not have been a focus on these organisations when seeking input for the review, and this is one reason that I did not become aware of it until about 10 days before the closure date for submissions. I hope it does not suffer too much as a result of it having to have been put together very rapidly.

Sincerely,

John Sinclair
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Submission To 2021 Regional Telecommunications Review

By J Sinclair - Kangaroo Valley Broadband Network

29 September 2021

Kangaroo Valley Broadband Network

Kangaroo Valley Broadband Network (KVBN) was established by me (John Sinclair) in 2018 to overcome a perceived shortcoming in internet coverage of Kangaroo Valley.

By way of introduction Kangaroo Valley (KV) is one of the very few fully enclosed valleys in the world. It runs for about 40KM from north-east to south-west and 15KM south-east to north-west. It almost completely surrounded by a steep escarpment ranging in height from about 80 to 680 metres. There is only one road accessing the Valley from the west, and four from the east. Within this area there a number of long narrow gullies, at points less than a kilometre wide and over 15km in length.

KV's prime industries are agriculture (predominantly beef and dairy cattle), and tourism. It is situated about two hours drive south of Sydney, one hour drive south of Wollongong and two hours drive north east of Canberra. Because of its location it is becoming increasingly popular with weekenders, retirees, and those who are able to work from home, at least part of the time. The exact number of full-time residents is difficult to assess given this floating population, but the 2016 census figures for Kangaroo Valley, Upper Kangaroo River, Beaumont, Bellawongarah, Budgong, Wattamolla, and Woodhill Mountain combined indicate there were 1437 full time residents in the Kangaroo Valley area living in 897 residences. During vacation times it is estimated the overnight population in Kangaroo Valley could sometimes treble, given the volume of guest accommodation, caravan parks and camp sites.

I have been providing IT and internet services in the Kangaroo Valley area for 15 years, connecting people to the internet, and trouble shooting any problems they may be experiencing with their computers. In the course of providing those services it became obvious to me that much of KV was being bypassed with services like ADSL, and later, the NBN Fixed Wireless network. My customers were continually complaining about the poor internet service they were receiving. For example, some businesses were unable to rely on providing EFTPOS services as it dropped out so often.



As a consequence of this I developed the concept of KVBN. The idea was to beam a signal from Nowra, over the eastern escarpment into KV Village. From the Village the signal would be retransmitted to 16 base stations strategically positioned around the escarpment and then beamed back down into all areas of KV. A diagram of the proposed full network is at Annex A

As a starting point I sought crowd funding from the customers I had and from the general community, offering them discounted services once the network was able to reach their particular location. I ended up with 166 funders who contributed \$1,000 each totalling \$166,000. Shortly thereafter, I became aware of the NSW Government Regional Digital Connectivity Program that was seeking submissions for funding to provide better services to rural and regional areas. A proposal was submitted and a grant of \$1,130,000 was awarded, to be administered by the NSW Telco Authority (NSWTA).

Understandably there were conditions placed on the grant and funding was to be provided in phases. The first phase was a proof of concept phase. In this phase a signal had to be successful beamed into the Valley and a 1 month Stress Test conducted. A number of unexpected events delayed the successful completion of this phase. They included:

- The Currowan Bushfire that swept through the southern part of KV in early 2020, the after effects of which are still being felt by a number of individuals in various parts of KV,
- The extreme rain event that occurred on the South Coast Shortly thereafter which delayed construction, and
- Covid lockdowns which delayed receipt of equipment required to construct the sites, as well as delaying the opportunity to construct the sites and install equipment.

Nonetheless the proof of concept phase was completed in February 2021 with very good results with respect to download and upload speeds, and reliability. It did, however, prove more costly than anticipated and used up all the NSW Government Grant money provided for that phase, plus all the crowdfunding contributions, and I also took out a personal loan to cover the final few expenses. This Proof of Concept stage made available network access to approximately 300 residences and business establishments. At the time of writing this submission, 42 subscribers are now connected.



The second phase of the network has now commenced and I am confident that the sites at Red Rocks and Mount Scanzi will be completed before November. The footprint will then encompass another 200 residences and business establishments, and those that subscribe will be connected as fast as possible once that occurs.

Private Land

For KVBN, the most profitable base stations are on private property. In each case I have been able to negotiate lease agreements with the landowners with the provision of unlimited fast internet connections as payment for the use of land. All sites so far are located on private land. Agreements have been struck with all the landholders that have enabled their construction and operation.

Crown Land

All the other sites envisaged are on Crown Land (National Park). To gain approval to use these sites there is an environmental assessment process to complete. Compared to a large Telco typical structure, KVBN's sites are small, solar powered and essentially invisible from the valley floor. Antennas are typically below the edge of a cliff with solar panels and network cabinet on the cliff top but back from the edge so that no part of the installation is in silhouette. Also, all components are painted so they are camouflaged.

Unfortunately site inspection has been delayed due to COVID restrictions. However the first site visit with NPWS Rangers should occur in October.

The issue with using Crown Land is that there are standard charges for doing so. For a single site in this area it is \$4,347 [IPART - Review of rental arrangements for communication towers on Crown land, 2013]. There is no allowance for a waiver to be sought, or granted withing the current regulations. The network design has 7 sites on Crown Land, and I cannot find any workable alternative to using those locations. Under the current regulations, this would cost KVBN \$30,429 per year. While that sort of expense could be born by a major Telco, it is prohibitive for a small Wireless Internet Service Provider (WISP), like KVBN. Furthermore a major telco is probably more likely to be constructing a single large site, not a number of smaller sites. NSWTA has been extremely supportive in negotiating with National Parks and it is hoped a successful resolution to the prohibitive charges will eventuate. The point I wish to make is, however, *The regulations and rental charges laid down for use of Crown Land may be appropriate for large businesses, especially in areas of high population density, but do not allow for smaller, less resourced businesses like KVBN in areas of low population density.*



Low Population Density

A country area, by its very nature has a low population density, in comparison to a city or regional centre. This means that when building a Wireless Broadband Network there will only be a relatively small number of subscribers for each base station. A base station costs between \$50,000 and \$100,000, getting a grant is essential, however, as outlined later in this submission, if you also need 3GHz to reach some customers and there is no alternative to install some base stations on Crown Land then running costs will exceed revenue very quickly. (See Annex B and Annex C for costings provided to NSW Telco Authority)

Access To Spectrum

There is a similar issue with access to radio spectrum. Most subscribers will be connected using the 5GHz band. However, even if they are in direct line with one of the base stations and there is foliage along the line of sight (of which there is a great deal in KV), then a 5GHz signal will be unable to penetrate that foliage.

A 3GHz signal will penetrate that foliage, partly because of a lower frequency but mostly because of the higher transmit power allowed in this licensed spectrum. Currently, there is no part of that band available to small WISPs like KVBN without having to pay unsustainable rental fees. Again, NSWTA is being most helpful in working through this problem.

NSWTA have determined that NBNC Co hold spectrum licences for 3GHz that cover Kangaroo Valley. They suggest that NBNC Co may be amenable to giving KVBN access to these for a low fixed price. Indeed, the ACMA during discussions about this problem also suggested that a Government owned entity like NBNC Co would not be able to just sit on a resource like radio spectrum, when there was a need in the community. I haven't yet made an approach to NBNC Co.

Without a solution such as this, the current regulations pertaining to frequency allocation in the 3GHz band do not allow for small WISPs such as KVBN to provide services in low population density areas. Licensed spectrum in the 3GHz band costs \$3,068 per base station radio per year. If 8 – 10 subscribers are connected to a base station radio, the site is uneconomical and services can't be provided. 8 - 10 subscribers per radio is typical for these 7 sites in National Parks.



Finally there will be a small number of locations in KV that will not be suitable for either a 5GHz or 3GHz radio. I have studied the problem carefully and believe that TV White Space (TVWS) in the 600MHz band would provide the solution. Being such a low frequency means propagation through trees and foliage is very good. There is available very good TVWS equipment off the shelf, and many jurisdictions around the world have licensing regimes and allow the use of TVWS for providing internet access in rural areas (at very low cost – and lightly licensed).

The Australian Communications & Media Authority (ACMA) have indicated to me that TV White Space has been “earmarked” to be sold for mobile phone services.

If a small part of that band could be reserved for WISPs, rather than it all being allocated to commercial organisations, it would assist WISPs to provide comprehensive coverage in geographically challenging areas.

Summary

I remain confident that KVBN will eventually have a network that will cover the whole of the Kangaroo Valley area and provide an internet service as good as is experienced in major cities. Many lessons have been learned in developing the network to its current state. It could not have been achieved without the help and support of the NSWTA who have been extremely helpful in supporting me navigate my way through the labyrinth of bureaucratic demands and requirements. KVBN is basically a single person designing, installing and administering the project. Large Telcos have parts of their organisation devoted to each of the elements of a project. The more time I spend on administrative matters, the less time I have to establish the full network, thereby leading to delays, especially in the eyes of my customers. So it is particularly frustrating when it appears that small WISPs don't appear to be taken into account when regulations are being contemplated and promulgated.

I believe the lessons learned in developing KVBN to its present state provide an example of the challenges faced by small WISPs attempting to provide a comprehensive internet service to rural and regional areas that larger ISPs have chosen, for whatever reason, not to provide a service similar to the one they provide to the higher population density areas of Australia, particularly the major cities. To me, the most important issues are:



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1. *Government agencies making laws and regulations on matters like charges to be imposed have to consider not only the large well resourced organisations, but also much smaller operators that fill in the gaps that the large organisations are not covering.*
2. *There needs to be provision for small WISPs with regard to access to spectrum. Perhaps it can be made a condition of NBNC's license that they make available their unused spectrum (when certain criteria are met).*

John Sinclair
Kangaroo Valley Broadband Network

Annexes:

- A. Kangaroo Valley Broadband Network Diagram
- B. National Park Sites, costings
- C. 3GHz License Fees, costings