

Ken McDonald – Response to JSC Terms of Reference  
Inquiry into the communications infrastructure in Australia's external territories

To: The Committee Secretary  
Joint Standing Committee on the National Capital and External Territories  
PO Box 6021  
Parliament House  
Canberra ACT 2600  
Phone: [+61 2 6277 4355](tel:+61262774355)  
Fax: +61 2 6277 8463  
[jscncet@aph.gov.au](mailto:jscncet@aph.gov.au)  
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RE: Report on the availability and access to enabling communications infrastructure in Australia's external territories

Response by Ken McDonald  
BSc BEng MEngSc MIEEE MAIST

[REDACTED]  
[REDACTED]  
[REDACTED]  
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## Introduction

I am an Australian Engineering consultant and run an engineering systems company in Australia with a worldwide customer base. While my office is based in Mornington Victoria my home and home office are located on Norfolk Island. My wife and I have been associated with the Island for more than 25 years.

My expertise is in the design of high speed real time software based control systems for a variety of heavy industries and the telecommunications industry. I have been involved in several projects delivering enhanced telephone and data services to outback and rural Australia and more recently have been involved in the design and development of advanced mathematical models for rolling hot and cold steel or Aluminium. From Mornington or Norfolk Island I manage several development teams of engineers worldwide and provide remote support to development and customer sites in Japan, North America, Europe, India, Bangladesh, China and Australia. My business relies on good stable low latency internet connectivity to service these needs. Recently due to the Covid pandemic travel limitations I have spent much of my time working from Norfolk Island. The challenges and limitations of working with worldwide development and customer groups have been made very visible by the need for remote working scenarios.

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## Terms of Reference

I would like to comment on the terms of reference as outlined by the Joint Standing Committee and firstly reproduce them here for reference. I will concentrate on aspects of the terms of reference for which I have most experience and would value the ability to discuss these in more detail during the consultative phase of the committee investigations.

1. the availability of, and access to communications technologies and infrastructure in each of the external territories;
2. future opportunities in enabling communications technologies and infrastructure in each of the external territories including telecommunications services, submarine cables, satellite capabilities;
3. opportunities and barriers arising from current and potential future communications infrastructure in each of the external territories;
4. examining the economic benefits of improving the availability of, and access to communications infrastructure in each of the external territories; and
5. recommendations for any future communications technologies and infrastructure for each of the external territories.

## Availability and access

Norfolk Island is an isolated community and its telecommunications systems are provided by a mix of satellite systems. These systems, although advanced in technologies suffer from the deficiencies of high network latency and relatively low data bandwidths. I view these deficiencies as major impediments to current and future communications requirements for Norfolk Island and the services which people, both tourists and residents and business come to expect in this modern world.

Services are provided by the following parties:

1. Norfolk Telecom
2. NBN via mainland providers and local installation and service people.
3. Bespoke leased satellite circuits for a number of government or semi government and financial enterprises.

Norfolk Telecom provides centralised services with PSTN voice network and data over ADSL, 3G/4G and wireless access points. The data backhaul is via medium earth orbit (MEO) and geostationary satellite systems. I should mention that the MEO system (SES or O3B) will be turned off later this year and replaced with a geostationary system. When this changeover occurs I see this as a major setback for internet data service provision as the relatively low latency of the MEO connection will be replaced with a high latency connection.

NBN installations on Norfolk Island were subsidised ( approximate amortised cost between \$7000 and \$8500 per subscriber ), and together with the cost of the satellite beams focused on Norfolk Island mean that the true cost of such a services is heavily subsidized. No backup is available in event of service failure and first point of call in the case of customer premises issues is the mainland based retail providers. NBN competes directly with Norfolk Telecom for data internet services. Customers can make a choice as to which service they choose, or in many cases, myself included, both Norfolk Telecom and NBN services. NBN installations are independent and each subscriber is effectively isolated from all other subscribers, so there is no ability to take advantage of centralised data distribution, redundancy and data caching opportunities.

Currently Norfolk Island is not serviced by submarine cable technology.

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## Future Opportunities

Several future opportunities present themselves for consideration.

1. Submarine cables. In 2016 there was an important opportunity to connect to the new Hawaiki cable being laid between Australia, New Zealand and east coast North America. Although various representations were made at the time the opportunity to connect was not taken up. New opportunities for high throughput, low latency submarine cable connection should be carefully considered.
2. Starlink low earth orbit satellite systems. Constructed and launched by SpaceX and now in beta testing. This is an exciting development and has the promise of high throughput low latency connections for under serviced regions of the world.

As background material, I have attached a private letter sent to the Hon. Senator Fiona Nash in October 2016 outlining a case for the submarine cable connection that was in planning at that time.

## Opportunities and Barriers

One of the barriers to improvement of services to Norfolk Island in my view is that there is no coherent all encompassing policy and planning for telecommunications services on the Island. The major providers compete against each other, as mentioned subsidised services competing against Island provided services. In addition, newer services like NBN do not have redundancy and cannot provide adequate services levels for business.

I believe that it is important to break down any inherent organisation barriers and all groups work together to come up with the best in class planning and implementation of future technologies. It is also particularly important to take the best possible professional advice when planning the future requirements.

The high latency for NBN means that interactive services fall far short of requirements. This is made very obvious for example when conducting video conferencing with worldwide teams. I typically spend 20 hours per week in Video conference calls with groups of 15-20 people located worldwide, but principally in Australia, Japan, Canada and USA. Audio communications is acceptable, but as soon as screen sharing is required, the low uplink rates to NBN from Norfolk Island mean that there is a delay of 10 – 20 seconds per screen update when sharing PC desktops for technical discussions, verses 1-2 seconds for a standard VDSL or fibre broadband links within Australia.

The workaround is often to have a colleague share a screen on my behalf from their PC ( in a high bandwidth location such as Melbourne or USA ), and then have me on Norfolk Island talk to their screen instructing them what to display.

Interactive services like remote diagnosis of issues on customer sites is also problematic with high latency low bandwidth connections. It simply takes too long to work through diagnosis of remote systems and download the necessary data required for diagnosis of problems.

## Economic Benefits

While I cannot quantify the direct economic benefits in \$ terms I can make several important points. These points are orientated to high bandwidth low latency connections such as submarine cable.

1. Ability to long line communications to Australian Telecom providers and get substantially lower cost calls. The ideal scenario would be local calls Australia wide at rates similar to those enjoyed in Australia.

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2. Improved remote medical diagnosis and turnaround taking advantage of high speed file transfers, remote specialists and AI cloud services. This can lead to improved patient care and importantly bring a remote island closer to mainland specialists.
3. Ability to stream data services like TV, movies and entertainment would be greatly enhanced. Better use could be made of multicast technology where applicable.
4. Currently slow internet browsing speeds would be significantly improved.
5. Use of what are now ubiquitous cloud services such as Azure, Google and Amazon can be greatly enhanced, delivering a better experience for technical professionals such as myself.
6. Low latency enables better use of interactive services such as remote customer equipment diagnosis, video conferencing and gaming.
7. Reliable 3G/4G backhails enable a much better experience for tourists and locals with their mobile phones.
8. Centralised management and distribution on island would provide for enhanced caching and distribution of data, together with redundancy.
9. High tech individuals and firms would be attracted to Norfolk Island if communications cost, latency, and throughput were improved.
10. Financial institutions and government and local admin departments would benefit from high reliability low latency connections.
11. Eliminate the need for various enterprises to provide their own leased satellite services by providing a reliable Island wide service. This would contribute to economies of scale.

### Recommendations for Future Technologies and Infrastructure

I have already mentioned a couple of technologies in the “Future Opportunities” point. I would trust that all available known options be explored by the committee.

I would ask that you carefully consider the points made above along with the other submissions that you may receive. I would welcome the opportunity to discuss these points further when the committee holds public and private sessions on the Island later this year.

Yours Sincerely,

Kenneth McDonald

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