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Committee Secretary
Joint Standing Committee on the National Capital and External Territories
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Parliament House
Canberra ACT 2600
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Dear Committee Secretary

Re: Submission to the Inquiry into the availability and access to enabling communications infrastructure in Australia's external territories

Indian Ocean Territories Telecom Pty Ltd (IOTT) wishes to thank the Joint Standing Committee for the opportunity to provide a submission to the inquiry into the availability and access to enabling communications infrastructure in Australia's external territories.

IOTT has operated in the Indian Ocean Territories since its inception in 2003. IOTT are a well-established Internet & Network Service Provider on the Cocos Islands with a number of tower/communication equipment sites. Being Cocos Islands based, IOTT is able to offer timely service and support, allowing local businesses and residents to get back online rapidly and efficiently.

All communications to and from the Cocos Islands are backhauled via satellite (as per the services that IOTT currently supplies below). With the proposed fibre link via the Perth to Oman undersea fibre cable (OAC), IOTT welcomes the possibility of migrating satellite services to wholesale fibre bandwidth. **IOTT is well placed to quickly and efficiently roll out Internet services to end users utilising the fibre backhaul bandwidth should it become available.**

On the Cocos Islands, IOTT supply services such as:

- NBN Sky Muster & Sky Muster Plus Satellite Services
- NBN Business Satellite Services
- Internet Services over C-Band Satellite
- Inter and Intra-Island High Speed WAN services both on and between West and Home Island premises
- 4G LTE Network

More details on the product offerings and comments regarding the use of these on the Cocos Islands below.

NBN Sky Muster & Sky Muster Plus

IOTT offers satellite services over NBN's Sky Muster Ka-Band. Bandwidth on these services are 25Mbps download & 5Mbps upload. Plans are based on peak and off-peak limits and range from:

Regular Sky Muster

\$40 per month for a 25/5Mbps, 10GB Peak & 15GB Off-Peak plan to
\$160 per month for a 25/5Mbps, 200GB Peak & 150GB Off-Peak plan

Sky Muster PLUS

\$60 per month for a 25/5Mbps, 25GB Peak & 25GB Off-Peak plan to
\$195 per month for a 25/5Mbps, 150GB Peak & 150GB Off-Peak plan

All plans have:

No Excess Data Charges

No Lock-in Contract

With the newer NBN Sky Muster PLUS plans, only streaming video and VPN traffic is Metered. Everything else is UnMetered. Meaning you can use as much web browsing, social networking, emailing, gaming, downloading etc as you like and not have your link slowed. Only Metered Traffic (streaming & VPN) is slowed once the metered data allowance is all used for the month.

IOTT feels that the introduction of NBN Sky Muster product has been an enormous boost to the Cocos Islands for residents and businesses alike. Particularly residents who have been readily able to take advantage of Internet entertainment features, for example social media and video streaming.

There have been challenges, namely:

- Quota limits, particularly for larger institutions such as the local High School. Introduction of NBN Business Satellite may resolve, however at a cost.
- Equipment failures due to harsh island environment. This may become more prevalent as the 80cm powder coated steel antennas are rapidly corroding.
- Rain Fade due to the nature of Ka-Band satellite.

IOTT recommends that NBN change to using 120cm moulded antennas which would be a better option to reduce rain fade dropouts and corrosion factors.



Example image of corrosion on a NBN 80cm powder coated steel antenna install approximately 3 years ago.



NBN Business Satellite Services

IOTT also offers NBN Business Satellite Services.

These are considerably more expensive than the consumer grade NBN Sky Muster products.

Customers need to purchase and maintain their own satellite equipment ranging from ~\$1800 to over \$20,000 per site, plus installation fee for a professional installer. However, this does allow for higher quality equipment not available on Sky Muster services. Rain fade is an issue for Ka-Band Satellite Services and larger antenna and higher-powered satellite modems allows for increased uptime.

Bandwidth options are 30/1Mbps (cheapest), 30/5Mbps & 13/13Mbps (most expensive due to high upload capability).

Monthly Plan Pricing is based on bandwidth and data plan selected. Data usage pricing is volume based, meaning there is no limit to how much data can be consumed, however it is priced per 100GB increments.

It is an expensive option, for example, the wholesale pricing for 100GB on a 13/13Mbps is over \$1700. 30/1Mbps & 30/5Mbps are less expensive.

There has been **no uptake** to date of NBN Business Grade Services on the Cocos Islands other than IOTT's own use for the 4G LTE network backhaul. Whilst it is a superior product, local and business/education/government users are either content with the consumer grade Sky Muster Services or not able to justify the high cost to implement and maintain this service.

C-Band Satellite

IOTT offers a C-Band Satellite Service for business/government wanting a higher availability or redundancy service. This is typically used as a backup link to NBN Sky Muster. IOTT has a C-Band Earth Station on West Island and can deliver to the customer wirelessly via IOTT's extensive local wireless tower network across the atoll.

C-Band satellite services do not suffer from the rain fade issues as readily as the NBN Ka-Band services. However, this comes at a cost as wholesale pricing for C-Band is over \$1,000 per Mbps and typically closer or above \$2,000 per Mbps.

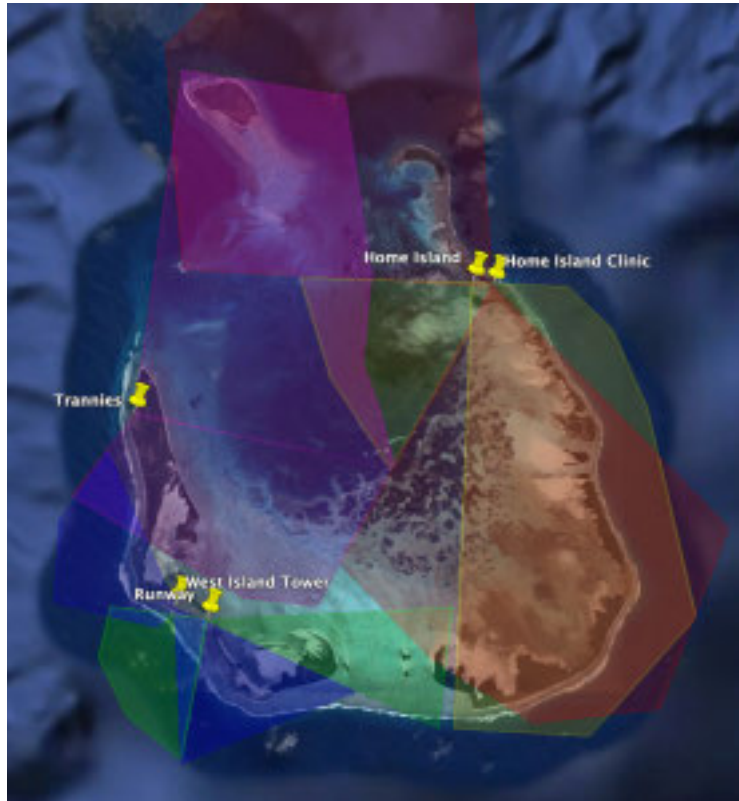
Inter and Intra-Island High Speed WAN

IOTT has an extensive intra & inter-island high speed wireless point to point 'backbone' network between the islands. At present this is used for providing high speed WAN (wide area network) campus links for entities such as the Medical centres, Schools, Shire, Water Corporation and local Cocos Islands Co-Operative. This is also used to provide the backbone for the 4G LTE network.

Future possibilities are to install a Point to Multipoint network on top of this 'backbone' network to provide high speed connectivity to the customer premises ("last mile") if the undersea fibre connection becomes available.

4G LTE Network

The 4G LTE provides network coverage for the majority of the main Cocos Islands atoll, lagoon and surrounding off-shore areas. There are currently 6 LTE Base Stations operating in the atoll on 5 tower locations, with additional tower/base station locations proposed. Current tower locations and coverage map shown below.

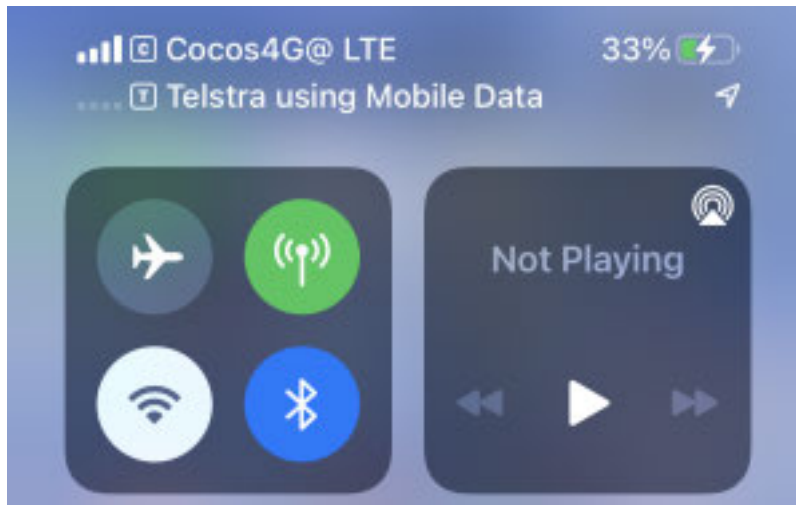


Calling options on the Cocos 4G LTE Service

- eSIM using Mobile Data – See below for more information (000 is routed to mainland emergency calling)
- Skype - can also have a traditional number to receive phone calls on.
- Chat apps. These include: Messenger, Whatsapp, Telegram, Signal, Viber, WeChat etc.
- WiFi calling - available if using a MiFi device (000 is routed to mainland emergency calling)
- Voice over IP - 3rd party App with an 089130xxxx number (000 calls on this are routed to the local AFP 0891626600)

eSIM using Mobile Data

Telstra, Optus, and Vodafone all allow you to use an eSIM instead of a physical SIM if you have a compatible device, such as an iPhone XS, Samsung S20 or Pixel 3 or newer. If you opt for an eSIM, this keeps your physical SIM slot free for a Cocos 4G SIM. This essentially turns your phone into a dual SIM phone.



Example image above is an iPhone XS with a Telstra eSIM on the Cocos 4G network. Telstra mobile calls & SMS are possible over the Cocos 4G network.

The network does not currently have Voice over LTE (VoLTE) capability or SMS (more details below). VoLTE may be a future possibility, however was not in the initial project scope. With the option of utilising your mainland provider's (eg Telstra) number, the option of dedicated Cocos VoLTE number on the Cocos Network has initially been deemed redundant and unnecessary.

IOTT VoIP

For users that do require a traditional number, another option is that IOTT can provide a VoIP number (eg 08 9130 88xx) used on your mobile via a 3rd party App.

IOTT is active with our upstream provider Concerotel in the **DITRD&C's Alternative Voice Services Trials Program**. These trials are designed to improve the Cocos Voice over IP service and aim to find better ways of delivering voice services for the future.

An extract from the media release:

"The trials are a great opportunity for new players to demonstrate new ways to provide better voice services, more in line with changing consumer needs particularly for greater mobility," Minister Fletcher said.

"I'm particularly pleased to see two small, innovative companies – Concerotel and Zetifi – in this first tranche of grants."

NBN Co will deliver up to 260 trial voice services across Australia, including across its fixed wireless and satellite networks, as well as trialling a low band fixed wireless solution.

Concerotel will deliver up to 200 trial voice services in the Cocos (Keeling) Islands and Norfolk Island, providing better VOIP services to mobile phones reliant on satellite links.

More information about the program:

<https://www.communications.gov.au/what-we-do/phone/phone-services/universal-service-guarantee-telecommunications/alternative-voice-services-trials-program>



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Voice over LTE (VoLTE)

The Cocos 4G network does NOT currently have Voice over LTE (VoLTE) capability or SMS. That is there are no 04 numbers locally available. This can be included as an additional capability in the future. However, as most users already have a number with one of the mainland carriers that can be used on the network (eg via eSIM) it is not only redundant it is more cumbersome to have multiple numbers. Also, users are increasingly using other methods for voice calling than traditional phone numbers.

Monthly Pricing

Initial pricing set for post-paid plans for Cocos Islands Residents and Businesses has been set at \$25 for 5GB and \$45 for 10GB.

Visitors to the Cocos Islands can organise a 4G WiFi router with a pre-paid data allocation through the local Community Resource Centre. This allows for atoll wide connectivity for Internet and WiFi Calling/SMS using their mainland provider's number.

Poor Economies of Scale

The remoteness of the Cocos Islands, high cost and low population equates to very poor economies of scale.

Whilst it is easy to criticise end user costs it is the **high costs that IOTT endures as an unsubsidised private entity** that make operating here on the Cocos Islands a difficult venture.

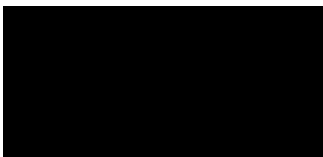
For example, the NBN Business Satellite Service wholesale cost alone to supply the 4G network is currently around \$700 per 100GB. 100GB equates to 20 Residential users on the 5GB plan, the revenue of which is only \$500 (\$25 each). This does not even include any of the other costs to operate a LTE network such as contractors/staff, (LTE & Billing) Software licensing, power, equipment replacement & maintenance and so on.

Conclusion

IOTT have worked hard over many years to bridge the so called 'digital divide'. We have a passion for the Cocos Islands and will continue to provide improved services for many years to come.

IOTT is well placed to supply local residents, business, education, government & visitors high speed Internet access now and deliver new technologies such as connectivity to the undersea fibre when it arrives on isle.

Yours sincerely



Brad Waugh
Managing Director