JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 1

The following question was submitted to the Attorney-General's Department on 29 October 2009:

1. What is the status of the Department's efforts in pursuing additional funds from the Department of Infrastructure, Transport, Regional Development and Local Government for improving internet bandwidth for Christmas Island?

The answer to the Committee's question is as follows:

The Department of Infrastructure, Transport, Regional Development and Local Government has not been approached regarding internet bandwidth for Christmas Island.

The Attorney-General's Department is sponsoring a whole-of-government solution for Information and Communication Technology services on Christmas Island for government facilities, including the school, hospital and offices. This is under the Information and Communication Technology reforms following the Review of the Australian Government's Use of Information and Communication Technology - Gershon Report. Community needs are being considered in this approach.

JOINT STANDING COMMITTEE ONTHE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 2

The following question was submitted to the Attorney-General's Department on 29 October 2009:

2. Has a cost comparison and/or feasibility study been undertaken of cable versus satellite technology in delivering improved communication services for the Indian Ocean Territories? If so, what were the findings/recommendations?

The answer to the Committee's question is as follows:

A feasibility study of communications services to the Indian Ocean Territories, specifically cable versus satellite technology delivery, has been conducted by the Christmas Island Chamber of Commerce. This was funded by the Attorney-General's Department through the Economic Development Fund. A copy of the report is attached.

CHRISTMAS ISLAND'S COMMUNICATIONS

A COMPARISON OF CABLE AND SATELLITE

John Hibbard

Hibbard Consulting

July 2008

This report is created and provided by Hibbard Consulting Pty Ltd, ABN 50 098 482 690

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A COMPARISON OF CABLE AND SATELLITE FOR CHRISTMAS ISLAND COMMUNICATIONS

Executive Summary

Christmas Island is currently serviced solely by satellite. The communications link is small and that is hampering normal communications as well the development of the island. One solution is to significantly increase the satellite capacity. This will improve the performance of applications such as the internet, however the development of improved health, education and offshore business applications will require such capacity as to make the use of satellite extremely expensive.

The alternative is to connect CI with a submarine cable. Ochre Networks is proposing to lay a cable between Perth and Jakarta and connect onto Singapore. The cable is intended to be ready for service in third quarter 2010.As this cable will pass close to Christmas Island, there is the potential to create a branch which could connect to CI and provide abundant capacity to Perth.

With only 5 years or so of phosphate mining remaining, CI needs to develop new industry to bolster the economy. The most prospective targets appear to be tourism and re-development of the casino and related gambling systems. However whatever the industry, it will need quality telecommunications in order to be effective. With quality and quantity of capacity, health and education limitations can be addressed such that Christmas Island is able to match services on the mainland. The assessment below clearly indicates a submarine cable represents the more attractive way of achieving the required standard of telecoms.

The opportunity to use cable is transient in that once the Ochre Networks cable is constructed, connectivity to CI will not be possible. As another cable is likely to be many years away, any intention to have submarine cable connectivity must be exercised now.

The primary proposal from Ochre Networks in which Ochre does almost everything and takes full responsibility for implementation involves an annual payment for 15 years which starts at $1.9 M and escalates 3% per annum. The NPV of this cost is $13.1M and it provides 10,000 Megabits per sec of capacity (CI currently has just 2 Mbps of capacity!!)

The alternative approach is for CI to make capital contribution of an estimated $8M coupled with annual payments of $0.7M pa for 1000 Mbps of capacity. This approach results in an NPV of 10.7M but carries the risk that in the current high demand, short supply environment pertaining in the submarine cable industry, the $8M might increase.

Ochre also offered to lay a Branching Unit and “stub” the branch for future installation of the spur to CI. By not doing the spur as part of the original project, there will significant added costs and uncertainty. Furthermore the $1.75M required to install the Branching Unit would not produce any benefit until the spur is laid subsequently. As such, this option does not appear very attractive.

The alternative of using satellite to provide similar services has been examined and our analysis shows that it is substantially more expensive at a starting cost of $2.8M per annum for a comparable offering. This produces an NPV of $41M over the 15 year period. Even if we forego the health and education benefits, the NPV is still $20M. As the satellite alternative is both

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technically and economically inferior to the cable alternative, it will limit the scope for the development of internet, health, education and business services for CI.

A submarine cable can fuel the development of CI and position it to offer its people close to comparable services with the Australian Mainland. It will enhance the tourist potential and facilitate the development of offshore banking, gambling and other industries as a transition path from phosphate mining.

In summary, this comparative analysis of cable and satellite indicates that provided the current is availed of, cable would have great attractions for the CI community and provide a lower cost means of providing the provision of high class services service in the future.

Background

Currently CI is served solely via satellite. The satellite capacity for voice and internet totals a meagre 2 Mbps incoming and 1 Mbps outgoing. The reason for the difference in each direction is that CI internet users download much more info than they send from the internet.

The current cost for this capacity is $8K per month paid to the satellite provider plus local operating costs (eg labour, power, consumables, etc).

Additionally CI receives four Australian television channels from the Optus satellite. (It is understood this satellite capacity is paid for by the Dept of Territories). As well, there are some private antennas which receive one or more Indonesian channels.

The population of CI is around 1200. The ethnic composition is 70% Chinese, 20% European and 10% Malay. Religions practised on Christmas Island include Buddhism 75%, Christianity 12%, Islam 10% and others 1%. English is the official language, but Chinese and Malay are also spoken.

There is one school with around 300 students. There is a hospital with 8 beds. There is a resident doctor on island, but any procedures beyond minor surgery must be done off-island (normally Perth) which involves substantial expense.

The principal contributor to the economy is tourism although this is not well developed due to lack of infrastructure and costs. The reduction in the immigration activities has reduced the contribution this made to the economy.

For commuications, there are about 1000 fixed phones and 600 GSM mobiles. The phone system is operated by Telstra. There is one ISP, CIIA, with about 500 customers, of which 400 or so have a broadband style service. There are 170 computers at the school but the total number on the island is unknown.

Discussions with persons on CI have all yielded the comment that the telecommunications service, specifically access to the internet is inadequate being extraordinarly slow. The School Principal advises while there are 170 computers in the school, their utility is limited due to the inability to effectively access the global internet.

Development Opportunities for CI

Given there was adequate external connectivity, the following developments could benefit CI.

Improved Internet Performance: The limitations of the current satellite link is a major contributor to the slow service experience on the internet. Good internet quality is essential to a sound tourism business.

Health: The ability to have a high capacity link to the a major hospital in Perth could assist greater greatly with the provision of medical services on the island. In many cases, this will allow a specialist in say Perth to review a case before travel and better assess whether travel is neeeded. Also it may allow the on-island doctor to carry out procedures under the guidance of a remote expert, particularly if video is available. Such arrangements are currently undertaken out of Perth with Vietnam and PNG, and more are planned. Former Australian of the Year, Dr Fiona Stanley is the driver behind this.

Education: In addition to increasing the utility of his existing computers, the School Principal advises that specialised distant education packages are available to enhance the educational experience and so allow the school to provide the same level of education as available on the mainland. Unless CI is abnormal, obtaining good teachers on a long term basis is difficult in remote communities and so better communications links have the advantage of being able to top up both the teachers and students knowledge through these distance learning programs. Additionally better entertainment and information can make it easier to attract and retain teachers.

Entertainment: Television is an important entertainment not just for the local community but for tourists. Diversity of TV channels is important and hence the availability of ethnic channels, international news as well as sport channels can enhance the viewing experience. Receipt of such by satellite may be possible but will depend on the access to suitable satellites and the strength of the received signal. Hence the quality of the signal and variety of choice will may be impacted. While the use of cable would produce superior quality transmission, access to Australian Pay-TV channels is now available via satellite provided there are sufficient subscribers to warrant the set-up of the service.

Offshore Business: Superior transmission links afford the ability to win offshore business. Where there is lower cost labour, call centres are a prime candidate. Where there is a suitable tax regime, offshore banking and gambling can represent attractive propositions. It is well known that Northern Territory has secured substantial online gambling platforms and Christmas Island, in conjunction with a re-development of the casino could replicate the NT and provide diversity and security to the industry., as well as generating useful tax revenues for CI.

Forecast of Potential Capacity Demand

In forecasting capacity, the most appropriate basis is to consider what has been experienced elsewhere. In some cases assumptions must be made. The estimate of demand has been based on the following:

Internet Demand

The mainland experienced over 100 % growth rate for 2 years after capacity became more readily available following the commissioning of the Southern Cross cable in 2000. It then eased to 80% then 60% and has stabilised over the past 3 years to between 50% and 60%. It is not unreasonable to believe that if there was abundant cost effective capacity available, then such growths should

be replicable on CI. But for the sake of conservatism because CI has already had some access to high bandwidth websites, a lower growth forecast is suggested. Currently the satellite capacity equates to a cable equivalent of 2 Mbps bothway. In the absence of abundant capacity this will only edge up to 2.5Mbps by say mid 2009. The forecast increment to 5 Mbps upon commissioning of cost-effective capacity could well prove to be on the low given the latent demand from the current poor service.

Health

The recommended minimum capacity if available is between 30 and 45 Mbps for the effective benefit of tele-medicine. I have assumed 45 Mbps increasing to 155 Mbps in 2015 as new applications of tele-medicine emerge.

Education

The typical bandwidth for a highly compressed commercial channel signal is 20 Mbps. However for distant learning, such sophisticated equipment is inappropriate so a less compressed standard of 45 Mbps has been adopted along with the assumption that this would increase to 155 Mbps in 2015 as remote learning programs develop further.

Entertainment

Whether it is Foxtel or some other cable TV provider, it seems reasonable to assume that CI will want some 6 channels over the cable system quickly growing to 15. This could include some of the free-to-air channels currently delivered via satellite. Each channel is assumed to require a bandwidth of 20 Mbps to support high definition television in the future. However lower grade quality for delivery to home rather than to a studio is possible with 5 Mbps bandwidth. Such is potentially possible over satellite at present but this opportunity has so far not been availed of.

Offshore Business

The demand for this is difficult to assess. However with the initiatives identified earlier, that to ensure optimum service quality, 20 Mbps will be initially required and is forecast to grow at 20% pa.

Projection of Demand

Demand (Mbps)	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**
Telephony and Internet	2.5								
Growth rate		100%	75%	60%	50%	40%	30%	30%	30%
Progressive demand	2.5	5.0	8.8	14	21	29	38	142	527
Health Link		45	45	45	45	45	155	155	155
Education Link		45	45	45	45	45	155	155	155
No of Cable TV Channels		6	8	10	15	15	15	15	15
Capacity per channel		20	20	20	20	20	20	20	20
Capacity for TV		120	160	200	300	300	300	300	300

Offshore Business		20	24	29	35	41	50	124	308
Growth			20%	20%	20%	20%	20%	20%	20%
Total Demand with TV	2.5	235	283	333	446	461	698	876	1445
Total Demand excluding TV	2.5	115	123	133	146	161	398	576	1145

These numbers appear at first glance to be extraordinarily large but are not out step with the growth projections being made on the mainland for Australia as a whole. For example internet capacity internationally from Australia has grown from 6 Gbps in total in 2002 to over 250 Gbps at end 2007.

The above figures include the option of delivery of high quality TV which would be possible via cable. This could be delivered via satellite for direct home delivery and hence the figures with it excluded have been provided. But if in the future CI wishes to have high definition television like the rest of Australia, that will almost certainly have to be delivered via cable.

The Qualitative Comparison of Cable and Satellite

Terrestrial connections (such as land fibre, microwave or submarine cable) have distinct advantages over satellite. For remote island communities, terrestrial connections mean submarine cable. The advantages are as follows:

- The connection is much shorter because for satellite it is necessary to connect through a satellite 36,000 kms above the earth. This adds signal delay in transmission (known as latency) and impacts upon the quality of voice calls. However more significantly it impacts upon the response time for internet, and hence limits the functionality of the internet.

- Satellite connections experience interruptions during solar eclipses (twice periods a year) impairing communications for up to an hour over several days.

- Submarine cables have abundant capacity and hence the ability to expand services is not constrained whereas for satellite, expansion of services is dictated by the available satellite capacity and the available signal from the satellite.

- The low latency, high capacity of cables is currently seen as a sign of the development of a country or territory as it positions the territorial domain for economic development, whether it is through improved access to health services, better distant learning functionality or new initiatives like call centres, offshore banking or related opportunities, or just better internet and voice communications.

- Increasingly tourists are demanding better access to the internet and the attributes of a cable can greatly improve internet performance.

- Satellites have the benefit of lower capital cost since most of the cost involves monthly payments for the capacity. On the other hand, cables have a higher initial capital cost. However for this capital cost, vast capacity is available whereas with satellite, every increment of capacity costs more in monthly charges. But possibly the most disturbing feature of satellite is the technology of the current radio frequency satellites in that satellites are at such an advanced stage of development that the price of capacity is unlikely to decline. As the cost of development increases to extract the next small increment in capacity, the unit cost can go up. Hence the unit cost of additional capacity seems likely to afford minimal if any discount with volume. Thus any decline in the cost of satellite capacity with increasing volume will be modest. This characteristic greatly disincents the expansion of capacity by users and as such more and more traffic is forced onto the small capacity with consequent impact on the quality of service.

- Free-to-air television such as the 4 main Australian stations may be easily received via satellite provided signal is available. Austar advises that pay-TV signals are available but to date have not been availed of. However this affords limited channels and if additional channels are not available on an accessible satellite, such would need to be delivered over cable.

- Satellite and cable can work in combination. The use of cable capacity for the majority of demand, supported by some modest capacity on satellite to ensure continuity of critical services (Phone, vital leased services such as the airport reservation/check-in system) will ensure continuity of service, in the unlikely event of a cable break. Of course TV can continue to be received via satellite.

It is these benefits of submarine that is why island communities around the globe are exploring the opportunity for securing cable connectivity to complement their satellite connectivity.

The Submarine Cable Opportunity for CI

Ochre Networks is proposing to lay a cable from Perth to Indonesia to Singapore. The cable will be routed in close proximity to Christmas Island (CI). Technology exists to insert in this main cable a “Branching Unit” which will allow some of the communication capacity of the cable to be diverted to Christmas Island so enabling direct cable connections between Christmas Island and Perth and/or Christmas Island to Singapore.

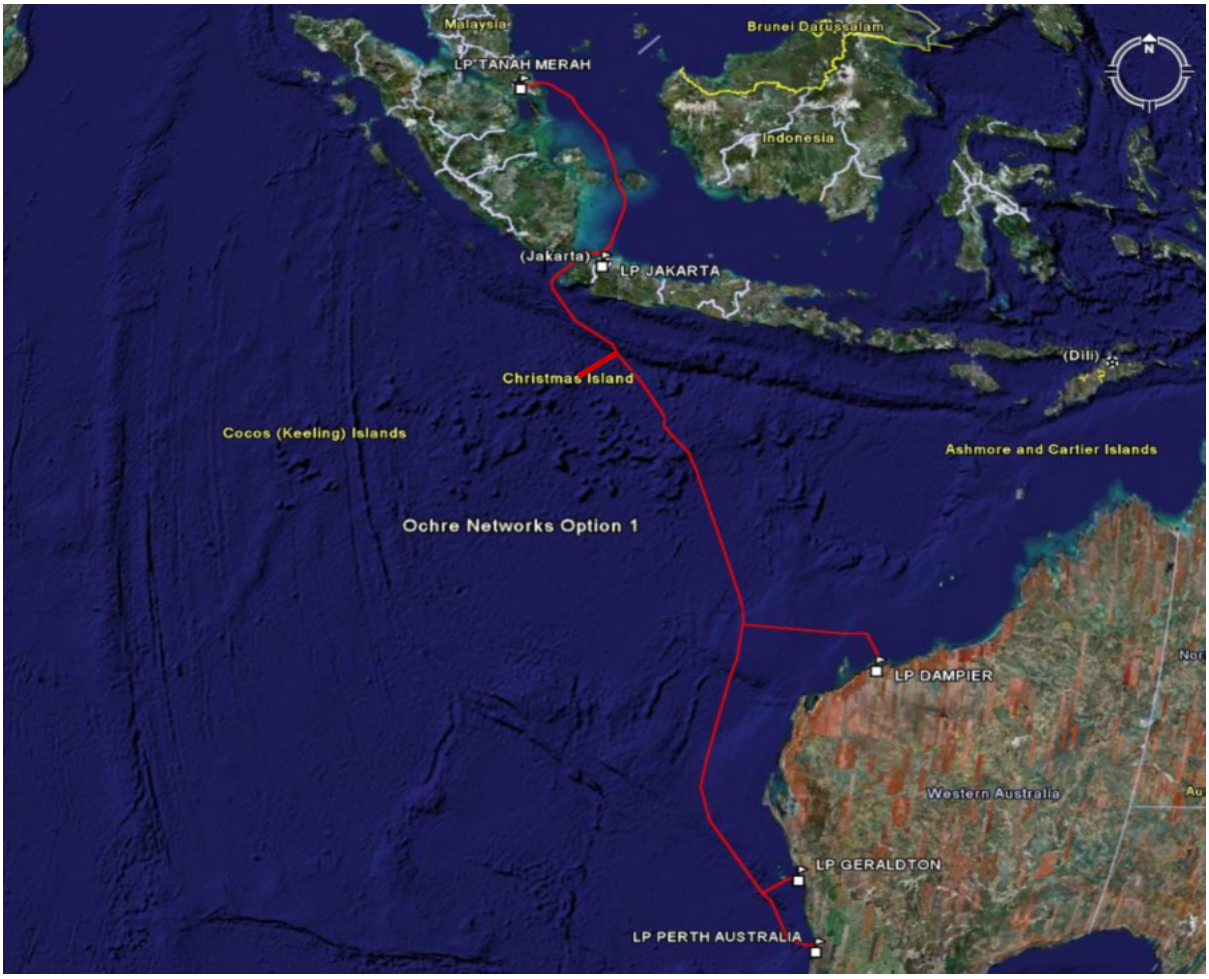
Submarine cables are very expensive and the Ochre Networks cable will cost over $US100M. The opportunity exists for Christmas Island to get access to this cable at a fraction of this cost. In fact, without taking advantage of this opportunity, it is unlikely that Christmas Island will have another opportunity for a cable in the next decade and potentially much longer.

Without submarine cable capacity, Christmas Island will have to continue to depend solely on satellite.

Description of the Ochre Project

Ochre Networks proposes to lay a high capacity optical fibre submarine cable between Perth and Indonesia with connection to Singapore. There are two options being pursued in Indonesia. One is with Matrix Networks which has just built a cable from Singapore to Jakarta. This cable has an unused branching unit well suited to providing a link to Perth. The alternative is that Ochre builds

its cable alone rather than in conjunction. The choice, which will be made by Ochre later this year, does not affect the provision of capacity to Christmas Island.



The Ochre cable, in going from Perth to Jakarta via the Sunda Strait, should pass in close proximity to CI as can be seen from the map. The exact distance away will depend on a detailed marine survey conducted by an oceanographic vessel which will plot the contours of the sea-bed and select a route which has the lowest risk. It will look for the optimum route through the submarine mountain ranges and valleys such as in the vicinity of CI. A previous study for the Nava cable, which did not proceed, indicated a route which was about 70 kms from CI. So it seems reasonable to assume that even with some variation in the route, it should be able to pass within 100kms of CI which is critical since it allows the spur not to require a submarine amplifier. Hence the design is much simpler and cheaper, and also the requirements for the cable station on CI far less. If there was an amplifier (a.k.a repeater), then it would have required the equipment necessary to feed power to it, which would be an added operations and maintenance task and a significant power drain. Fortunately it seems unlikely this will be the case.

At an appropriate point on the main cable adjacent to CI, a Branching Unit (BU) will be installed. The most recent versions of these allow selected wavelengths to be picked off and delivered to the spur. This avoids the need to route mainstream traffic into and out of CI which would have occurred in the past. This further simplifies the operational activity at CI.

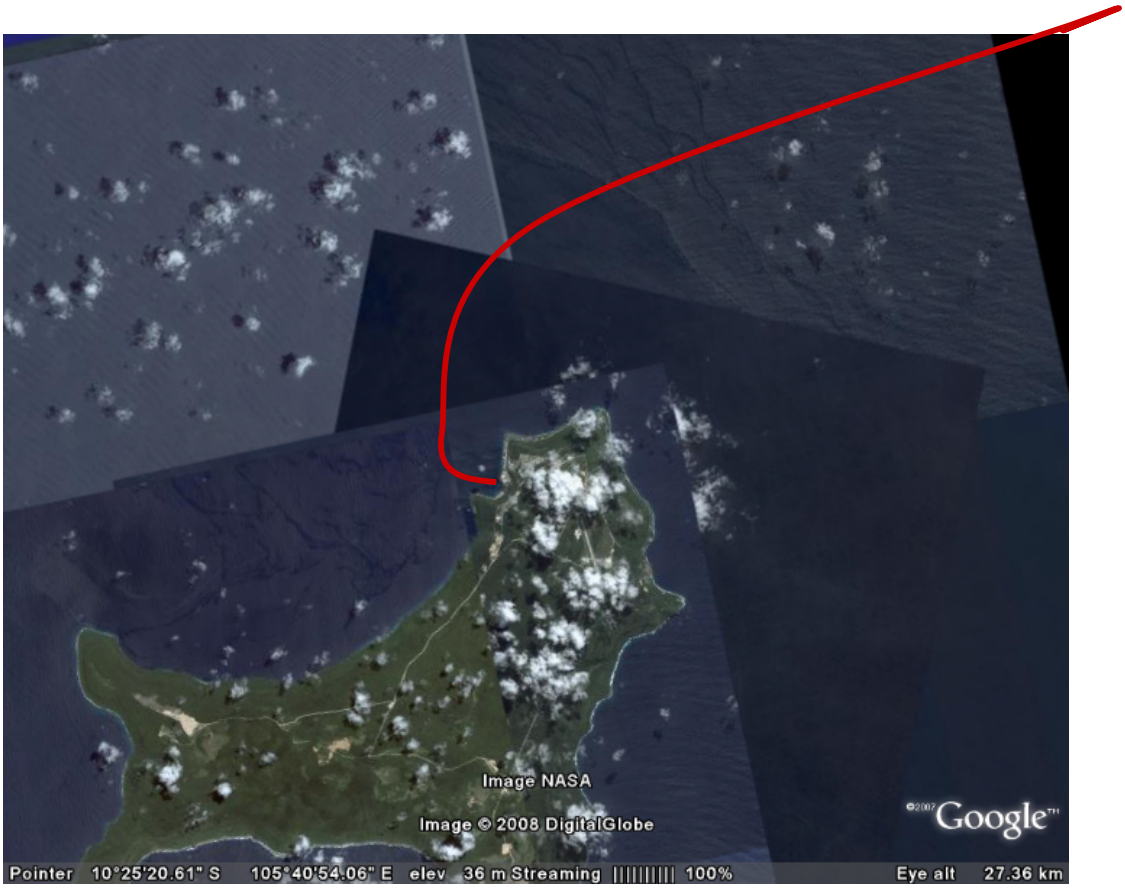
Branching Unit

Each wavelength has the capacity of 10 Gigabits per second (Gbps), or 10,000 Megabits per second (Mbps). Compare this to the current capacity of 2 Mbps which services CI now. One wavelength will be picked off for CI affording a 10 Gbps link between CI and Perth.

The spur cable is laid from the BU toward CI by the specialist cableship. The cable is brought ashore at a suitable point, desirably around Flying Fish Cove, so as to have only a relatively short land route to the cable station. The cable station can be in a normal telecom building as the cable system equipment only involves a few racks.

The arrangement being proposed here is almost identical to that currently being implemented off Madang in northern PNG where the Pipe Networks cable between Sydney and Guam will have a BU some 83 kms off the coast from Madang.

The above photo is of the Ile de Re, the Alcatel-Lucent cable ship which services the Pacific.



Possible Route of the Cable

Project Implementation

The implementation of the Ochre Networks cable depends on several factors. Firstly there is finalisation of the arrangements in Indonesia. Secondly there is the funding which needs to be obtained. Thirdly there is availability of equipment (cable and electronics) and a suitable cableship. With the current heavy installation program for submarine cable, ships and cable are in short supply with consequent queues.

Ochre is currently targeting August/September 2008 for finalisation of the Indonesian issue and the funding. However this might be delayed if the desired arrangement in Indonesia does not materialise. Tenders have already been called and are being assessed. Assuming the GO button is pressed in July (in anticipation of a positive outcome on Indonesia and funding), the project should be completed in 3rd quarter 2010. The principal determining factor in the timeline is the availability of cableships and the factory production of cable systems, due to heavy current demand for submarine cables due in part the growing realisation of their value to the development of countries.

Thus CI could assume that it should have the abundant capacity from fourth quarter 2010.

As to project risk, the professionalism, conservatism and experience of the submarine cable industry is such that if the project proceeds, it is highly unlikely that the implementation will not be successful. The biggest risk is that the project will not proceed. A previous similar project Nava did not proceed due to lack of funding which was result of the bursting of the internet bubble in 2002.

Project Cost

The full Ochre Networks cable system will cost around $US 100M.

Based on the experience in PNG, the cost of the spur to CI should be approximately the following (noting all dollars in this report are US Dollars):

Branching Unit	$1500K
Spur (assume 80 kms)	$5000K
Station Equipment	$ 500K
Manhole and Duct route	$ 250K
Install and Commissioning	$ 500K
Miscellaneous	$250K
Total Supplier Cost	$8000 K

However it should be noted that given the current supply and demand situation, the cost could be somewhat more.

Additional to the above cost would be a cost to CI for preparation of the cable station, the equipment to derive the various applications from the capacity, and the management of arrangements. This will total about $500K.

Finally, CI would need to acquire capacity on the main cable to obtain its capacity down to Perth (the above work only gives CI capacity in the spur). Ochre plans to sell wavelengths for $1M pa on the cable for a 15 year term. Based on the markets elsewhere in the region for similar capacity, this seems a very competitive price. The current systems between WA and Indonesia charge over the equivalent of $5M pa. However a wavelength of 10,000 Mbps is far more than CI will need in the next 15 years so following negotiations, Ochre has agreed to offer a 1000Mbps module for $700K per annum.

Operations & Maintenance

Once the cable is installed and traffic is activated, there will be operational costs. Also there will be maintenance costs as it is necessary to acquire an “insurance” policy so that there is a ship available to come quickly in the event of a cable break. The ship may be doing other work at the time (such as laying) but in the event of being required for a repair will stop what is doing and head for the repair location.

The cost to Ochre of the insurance policy for the main cable will be around $1M pa. Additionally the cost of operating the cable will be around $400K pa. These costs would be shared amongst the cable users and are normally built into the lease cost of the capacity.

The cost for marine maintenance of the spur would be around $25K pa, something would likely increase over time.

Overall Cost

Looking at the costs, and using a discount rate of 15%, we arrive at the following

Christmas Island	**KUSD**								
Item	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**
Stubbed BU	1500								
Spur of 80kms - supply and install	5500								
Terminal equipment	500								
Duct route	250								
Miscellaneous	250								
Rental of Wavelength		700	700	700	700	700	700	700	700
Spur Cable O&M		25	25	25	25	25	25	25	25
Total	8000	725	725	725	725	725	725	725	725
Rate	15%								
NPV	$10,710								

Over a 15 year period, the NPV of the supplier costs is $ 10,710 K.

Additionally there would be a one-off cost of about $500K as the cost to CI for preparation for the cable.

Alternative Ochre Proposal

Ochre has proposed an alternative whereby a fee of $1.9M pa for 15 years. This fee covers the supply and installation of the branching unit, the spur cable, the beach manhole and duct route and the terminal equipment. It involves testing and commissioning Subsequent to commissioning, it includes the operation and maintenance of the system. It also covers the risk of any increase in cost in the supply of the spur. Under this model, 10,000 Mbps of capacity is provided whereas in the one above it is only 1000 Mbps.

Ochre has proposed that the cost be increased 3% per annum over the period

The cost over the same period as above using a 15% discount rate results in an NPV value of $13,118K.

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**
		1900	1900	1900	1900	1900	1900	1900	1900
Increment rate	3%								
		1900	1957	2016	2076	2138	2203	2553	2960
NPV	$13,118								

Additionally there would be a cost of about $500K as the cost to CI for preparation for the cable.

Scope might exist to reduce the figure of $1.9M in return for a reduction in capacity to 1000 Mbps and this negotiation is appropriate after it is decided to proceed to the next stage.

System Ownership

Under the arrangement where CI paid separately for the link from the BU to Christmas Island, it might be argued that CI is entitled to (and should) own the spur and have title to it. While this might have some economic attractions such as depreciation, it carries with it significant complications in regards contractual arrangements, assignment of risk, liabilities should a failure in the spur impact the main cable, operational arrangements in the event of a system failure.

The alternative is for all the system and equipment to be owned by Ochre. As such there are no issues in regards operation and maintenance. As such if the option involving a capital payment is adopted, then this payment should be seen as a capital contribution not a purchase of the spur.

The "Preserve the Future" Option

Ochre Networks has also offered an option which would preserve the scope for a branch in the future. Their proposal is to lay a branching unit in the cable off Christmas Island and then stub the spur for later implantation. The cost of doing this is $1.75M.

However to take advantage of this in future, it would be necessary to pick up the stubbed spur, connect it to new cable and lay that cable to CI. Equipment would need to be installed at CI to access the cable capacity. An estimated cost of doing this is at least $10M. The extra cost over doing it now is because of the need for to re-start the work including the design work, mobilisation and bringing on-site of a ship and obtaining the expertise to do the work.

While this represents an option to preserve the future ability to provide a cable, it is not recommended.

The Satellite Alternative as a long-term solution for CI

CI has to date been served by satellite. The technical and commercial parameters associated with satellite have contributed to some of the complaints about network performance experienced of CI.

Technically the challenge for satellite operators is to extract more capacity from the satellites at a reducing unit price. As this is proving a real challenge, the potential for satellites to service the increasing needs of CI in a cost effective way seems to have issues.

However without doubt, satellites could provide the basic needs of CI. The latency issue would impact internet, and would limit the offshore development opportunities, but effective core communications could be maintained. However the ability to have the improvements in health and education mentioned earlier would be limited as it would become prohibitively expensive.

The attraction of satellite is that it is very much a Pay-As-You-Go model with limited capital expenditure. Thus you do not have to bet on the future with a large capital amount. However the monthly lease cost rises almost linearly with capacity. A consequence of this can be that there is often great caution in acquiring additional capacity causing capacity constraints and customer

complaints. More and more demand seeks to access the available capacity with a resulting rapid decline in service quality. This is turn suppresses demand but in the process limits the development of opportunities. Cable on the other hand gives abundant capacity at a significant capital cost but opens the door for new applications and high quality customer service.

An analysis has been conducted by Hausfeld Consulting, an associate of Hibbard Consulting, of the alternative of providing the above services on satellite and that is in Appendix 1.

Extracting from the Report of Hausfeld Consulting

In the analysis, the assumption has been made that television would be delivered via satellite. This is because Christmas Island would receive existing television services from the various satellites visible, and would not need to pay for dedicated satellite television capacity.

Next, we need to consider whether the remaining requirements are full duplex (two-way) or only half duplex (one-way), and if full duplex whether the requirement in each direction is symmetrical
On a cable, capacity is always allocated in symmetrical full duplex circuits. However on a satellite,
each direction is dealt with separately.

From the requirements in the above table, telephony is always symmetrical full duplex, but internet/health/education are usually heavily skewed with a higher rate on the download direction. We will assume that the offshore business is also asymmetric, but maybe not so much as internet. If we assume that internet/health/education is skewed 4:1 in favour of downloads, offshore business 2:1, and ignore the television requirements, we end up with the summary of satellite capacity required shown in the following table. For large enough antennas, one can obtain a conversion of 0.6MHz of satellite bandwidth for each 1Mb/s of data rate. We will also assume a favourable C-band space segment cost of around $2,500/MHz/month.

It is quite reasonable to assume that one might be able to acquire 4 to 5 transponders worth of capacity on a single satellite. So in the years until 2014 a single large C-band ground station facility is probably sufficient, at an initial capital cost of US$500,000 in addition to the cost of the capacity on the satellite.

However, in later years if these forecast requirements are accurate, then access to multiple satellites would be required. An additional satellite ground station facility costing a further US$500,000 would be required by 2015 and another by 2020. By 2025 the traffic forecast is more than enough to fill one fully dedicated satellite.

Just for comparison, the cost to procure and launch a whole satellite is currently approximately US$200M, including launch insurance, with a design life of each satellite on the order of 15 years maximum.

The results of the analysis are as follows:

	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**

Downlink Direction										
Telephony/Internet	(Mb/s)	2.5	5	8.8	14	21	29	38	142	527
Health Link	(Mb/s)		45	45	45	45	45	155	155	155
Education Link	(Mb/s)		45	45	45	45	45	155	155	155
Offshore Business	(Mb/s)		20	24	29	35	41	50	124	308
Uplink Direction										
Telephony/Internet	(Mb/s)	2.5	2.5	2.5	3.5	5.25	7.25	9.5	35.5	131.75
Health Link	(Mb/s)		11.25	11.25	11.25	11.25	11.25	38.75	38.75	38.75
Education Link	(Mb/s)		11.25	11.25	11.25	11.25	11.25	38.75	38.75	38.75
Offshore Business	(Mb/s)		20	24	29	35	41	50	124	308
Total Satellite Data	**(Mb/s)**	5	160	171.8	188.0	208.8	230.8	535.0	813.0	1662.3
Total Satellite BW	**(MHz)**	3	96	103.1	112.8	125.3	138.5	321.0	487.8	997.4
Number of equivalent 36MHz satellite transponders		0.1	2.7	2.9	3.1	3.5	3.8	8.9	13.6	27.7
Space Segment Cost estimated in US$,000 per month		**7.5**	**240**	**258**	**282**	**313**	**346**	**803**	**1,220**	**2,493**

Without any cost for television, the annual cost for these services starts at $2.88M and increase steadily through the 15 year period. And beyond 15 years, these charges continue to increase unless CI acquired its own satellite for $200M.

In order to compare this with the cable alternative, we need to determine the Net Present Value of the satellite alternative.

Model with Voice, Internet, Health, Education and Offshore Business									
Millions of USD	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**
Annual Satellite Capacity Cost	0.09	2.88	3.09	3.38	3.75	4.17	9.63	14.63	29.92
Earth Station Provision		0.50					0.50	0.50	
Total	0.09	3.38	3.09	3.38	3.75	4.17	10.13	15.13	29.92
Discount rate	15%								
NPV	**$41.71**								

The NPV of the satellite alternative is a whopping $41.7M compared to the cable option of $10 to $13M. Obviously the use of the satellite for health, education and offshore business makes the satellite alternative extremely unattractive.

It is informative to see what it will take to make the satellite option more attractive. If the health and education functions are removed, then the following result is obtained

Model with Voice, Internet, and Offshore Business

Millions of USD		**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**
Annual Satellite Capacity Cost		0.09	0.86	1.07	1.36	1.72	2.15	2.65	7.65	22.95
Earth Station Provision			0.50					0.50	0.50	
Total		0.09	1.36	1.07	1.36	1.72	2.15	3.15	8.15	22.95
Discount rate	15%									
NPV		**$20.03**								

Still the NPV is greater than for the cable which is carrying the health and education applications.

If we repeat the exercise and remove the Offshore Business application leaving only voice and internet, the NPV drops to $7.2M which is less than the cable alternative.

Comparison of Satellite and Cable

From a technical viewpoint, the cable is superior to the satellite in the performance that it offers with low latency.

From a capacity point of view, the cable has more than sufficient capacity for 15 years and potentially the 25 years of its design life. Satellite on the other hand requires the building and launching of additional satellites, and the supply of capacity will be constantly under pressure.

From an economic viewpoint, satellite is significantly more expensive than cable. This will become more and more so as time progresses. For the above service model, the NPV for satellite is $41.7M compared to $10.7M or $13.1M for cable.

Satellite costs can be reduced by cutting services but this is hardly compatible with the development of CI. However should we eliminate the Health and Educational service, then the satellite NPV becomes $20.0M still more than the cable NPV which does not change with the reduction of services.

By removing the capacity assigned for offshore development, the NPV declines to $7.2M making it more attractive than cable but this alternative will potentially limit the development opportunities of CI.

From a services viewpoint, cable affords the opportunity of the development of new services to afford CI a closer approximation to the services within Australia than possible with satellite.

From a reliability viewpoint, both cable and satellite have their potential for outages, but with the exception of the regular solar eclipse outages, both are fundamentally reliable. In the case of the cable, a small capacity via satellite is a prudent move to cover the situation of a cable failure and to provide for lifeline service during the period of repair.

So overall, there is really no comparison in the case of Christmas Island – the cable alternative is far superior to satellite assuming CI wishes to take advantage benefits that the cable has to bring.

Timetable for Decision

The planning of the Perth – Indonesia – Singapore cable is proceeding rapidly. While no placement of an order has been made with a cable supplier, tenders have been called and evaluated so it would seem that an order is imminent. Once an order is placed, then the addition of a spur to CI would involve a contract variation which is potentially more expensive than if a commitment is made before the order is placed. Thus an early decision will enhance the commercial terms of the arrangement.

The terms provided are indicative and require detailed negotiation to ensure that the outcome is favourable to CI. Therefore some form of letter of intent would greatly assist the process.

Next Steps

Following receipt of this report, the following actions should occur:

1. The CI and other authorities need to consider the report, seek any initial clarifications and ask any questions

2. Assuming there is no outright rejection of the idea of a cable, then subject to CI concurring, Hibbard Consulting will visit CI to present the findings and assist in reaching a decision in principle. While on CI, Hibbard Consulting will review the landing site and cable station as a prelude to a future full survey. This will conclude the work covered by the contract with Hibbard Consulting.

3. Once CI has reached a decision, this should be conveyed to Ochre Networks, possibly via a letter of intent.

4. CI will need to negotiate the terms in detail and finalise the contract with Ochre Networks, get it signed and any funding arranged.

5. CI will need to undertake any preparation needed on CI to receive the cable and manage the relationship with Ochre Networks.

6. CI will need to develop arrangements with the various service providers in order to implement the services to benefit CI

Appendix 1 -- Christmas Island Satellite Alternative

This is provided in a separate associated document.

HAUSFELD CONSULTING

ABN 52 518 506 476

Report on Christmas Island Satellite Options

Issue 1.0

5 June 2008

Abstract:

The purpose of this report is to provide a brief review of the possible satellite requirements and options for Christmas Island, in order to allow comparison with the submarine cable alternative.

Issue and Amendment Register					
Issue	**Date**	**Page**	**Para**	**Description**	**By**
1.0	5th June, 2008	All	All	Full Version	GH

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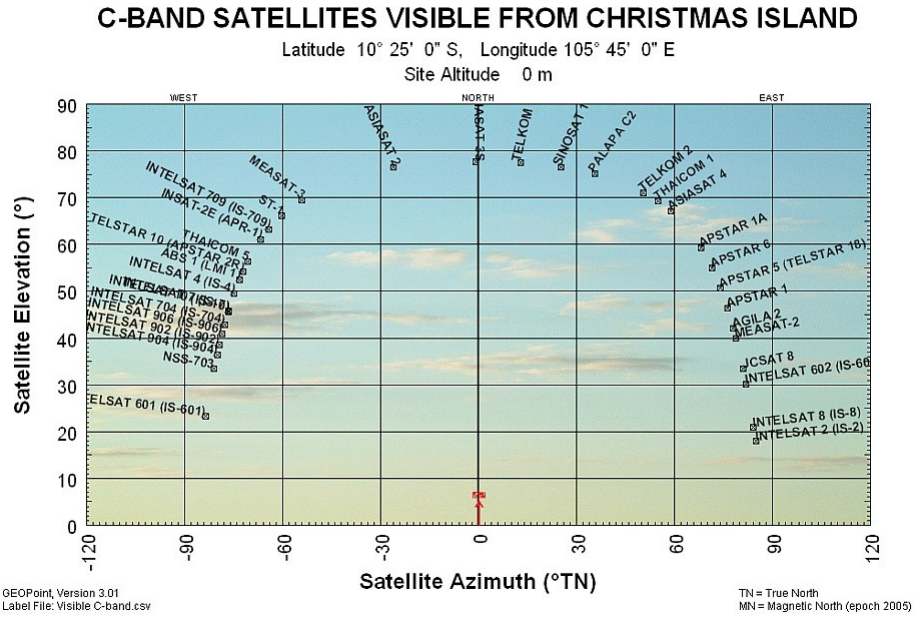
Index of Tables

1. Introduction

The purpose of this report is to provide a brief review of the possible satellite requirements and options for Christmas Island, in order to allow comparison with the submarine cable alternative.

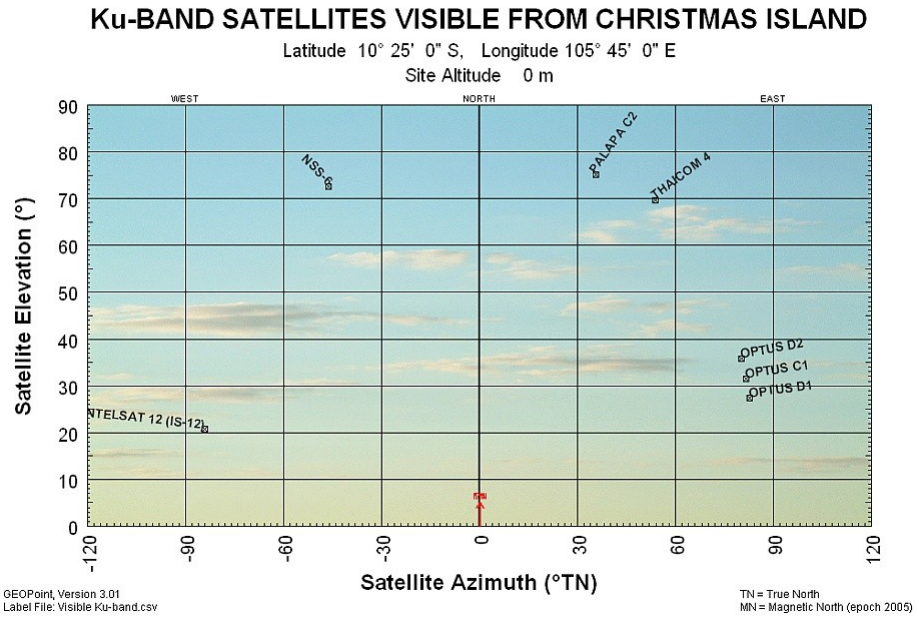
2. Christmas Island Satellite Coverage

Christmas Island is currently covered by a number of Indian ocean, Asian, and Pacific Ocean satellites. Most operate at C-band frequencies, but there are a few which provide Ku-band coverage. A complete list along with pointing angles information is provided at Attachment 1.



Picture 1: C-band Satellites visible from Christmas Island (see attachment 1).

These diagrams and the lists at Attachment 1 show only those satellites which are above 15 degrees look angle, and which actually have a beam footprint covering Christmas Island.

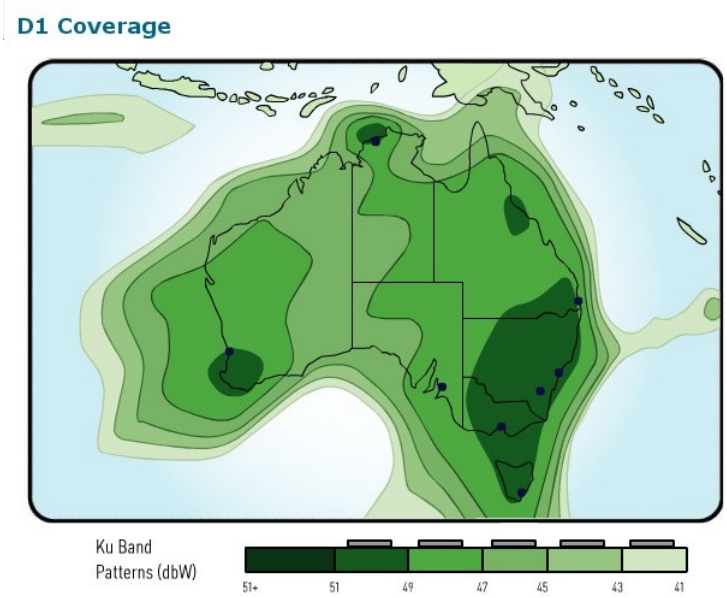


Picture 2: Ku-band Satellites visible from Christmas Island (see attachment 1).

3. Satellite Television Services

3.1 Australian Television Services

In 1999 [Ref.1] Christmas Island was receiving some free to air Australian television channels which were broadcast by Telstra on the Panamsat satellite. At that time, the indications were that the new planned Optus satellites would not provide coverages to Christmas Island. However, since that time the new Optus D1 and D2 satellites have been launched, and these spacecraft do provide coverages to both Cocos and Christmas Islands.



Picture 3: Optus D1 downlink footprint. (from www.optus.com.au).

Optus D1 was launched in October 2006. . It carries 24 Ku-band transponders designed to provide fixed communications and direct television broadcasting services to Australia and New Zealand and specific offshore locations such as Christmas Island. Optus D2 was launched in late 2007, and provides ongoing capacity for ethnic broadcast services and VSAT services. Optus D3 is planned to launch in 2009 to the 156E location and will be collocated with Optus C1 to provide enhanced capability for the Australian hotbird location delivering direct-to-home services across Australia and the island territories.

Visibility of these Optus satellites from Christmas Island allows full access to all of the Australian free to air and pay television services broadcast on those satellites at Ku-band, with relatively small receive dishes. The power level over Christmas Island is lower than much of the mainland, and the Ku frequencies can be susceptible to rain fade during the wet season. But both of these issues can be fixed by using larger receive dishes.

It is believed that Telstra still uplinks some free-to-air television programs onto the IS-2 (formerly known as Panamsat-2) satellite at Ku-band, which could still be received by Christmas Island. However, the IS-2 (PAS-2) satellite is nearing the end of it's life. Intelsat plans to replace this satellite with IS-5 (PAS-5) in early 2009, however the newer satellite does not have the same Ku-band footprint. Telstra has stated it's intention to move all of it's services from IS-2 (PAS-2) to the Asiasat 4 satellite before 2009. But Asiasat 4 does not cover Christmas Island. So if Christmas Island do still use any of the remote area TV services from Telstra, they will be losing access to these very soon.

3.2 Foreign Television Services

Most of the satellites visible from Christmas Island provide some mix of both free to air and pay television channels. In particular the Asiasat, Measat and Thaicom satellites all have significant communities of Asian television channels, including a large number of both Chinese and Indian language channels. Most of these channels operate in the C-band frequencies, requiring moderate size receive dishes, but are thus not effected by rain fade issues.

4. Typical Costs for Dedicated Satellite Capacity

4.1 C-band Space Segment Lease

The price of satellite capacity is specified in US$ per MHz unit of bandwidth per month. Prices can vary significantly from satellite to satellite depending upon the age of the satellite, the available capacity, the power of the beam, the size of the coverage area, and the number of existing users. Also there will generally be discounts available depending upon the size of the lease and the term of the lease contract. Prices on the satellites visible from Christmas Island typically vary from US$2500 to US$2800/MHz/month.

The typical user will need to relate this bandwidth price to something related to the usable data rate. Throughput for a given bandwidth depends upon the power of the satellite, the sizes of the receiving dishes, and the modulation scheme used. For reasonably large dishes (7m or better) at both ends of a link, and using a reasonably high power satellite, one can assume 8PSK modulation, equating to about 0.6MHz per 1Mb/s in each direction. A lower powered satellite, while possibly cheaper per MHz, may only allow QPSK modulation, or 0.9MHz per 1Mb/s.

So typical costs would range from US$1700-2300 per Mb/s per month.

Note that this is per link in each direction. So cost of a full duplex symmetric link would be double this figure.

4.2 Ku-band Space Segment Lease

Typical prices for Ku-band satellite capacity range from US$3200 to US$5000/MHz/month. The reason for higher prices at Ku-band are partially due to the higher cost of the components on the satellite, but mostly also due to supply and demand, since Ku-band is in less supply and higher demand.

As with C-band, reasonable size dishes will allow use of more bandwidth efficient modulation. Typically 0.6MHz per 1Mb/s will be possible on point to point links.

So typical costs for Ku-band capacity will range from US$1900-3000 per Mb/s per month for a half duplex circuit.

5. Typical Costs for Satellite Earth Stations

5.1 TV Receive Only Dishes

The cost of small Ku-band (1m) receive only equipment is typically less than $500 each. This includes dish, LNB and IRD set-top box. Costs may go up to $1000-1500 if a larger dish is required to avoid rain fade in the wet season.

At C-band, a mid size (2-3m) receive only facility might cost from $1000-5000. While large antennas (7.3m) may cost as much as $40,000.

5.2 Full Service Telco Grade Facilities

In order to provide the maximum capability, and most efficient use of the leased satellite bandwidth, it is necessary to have a reasonable sized antenna at both ends of a dedicated link. The minimum requirement would be a 4.8m dish, and something like a 7.3m dish would be most suitable. At Ku-band such an antenna would need automatic tracking capability of the satellite, but this is not a must at C-band. Given the climate at Christmas Island, a High Wind capable antenna is recommended to guarantee survival from cyclones. This drives up the price and manufacturing time of the dish. Also, for a critical telco grade facility, all of the electronic communications equipment will need to be fully redundant with automatic switch-over in case of failure.

Budgetary prices for planning purposes for a C-band high-wind rated 7.3m antenna and associated electronics, cabling, installation, etc would be US$500,000 and lead time of 5-6 months.

6. Comparison with Submarine Cable

6.1 Forecast Cable Requirements

The following table from Hibbard Consulting presents the current forecast demand for services on the proposed submarine fibre cable. All figures in Mb/s data rate.

Cable System Demand

Demand (Mbps)

	2009	2010	2011	2012	2013	2014	2015	2020	2025
Telephony and Internet	2.5								
Growth rate		100%	75%	60%	50%	40%	30%	30%	30%
Progressive demand	2.5	5.0	8.8	14	21	29	38	142	527
Health Link		45	45	45	45	45	155	155	155
Education Link		45	45	45	45	45	155	155	155
No of Cable TV Channels		6	8	10	15	15	15	15	15
Capacity per channel		20	20	20	20	20	20	20	20
Capacity for TV		120	160	200	300	300	300	300	300
Offshore Business		20	24	29	35	41	50	124	308
Growth			20%	20%	20%	20%	20%	20%	20%
Total Demand	2.5	235	283	333	446	461	698	876	1445
Capacity of Link	10000	10000	10000	10000	10000	10000	10000	10000	10000

Given the population of Christmas Island is less than 2,000 people, these figures appear phenomenal.

6.2 Satellite Alternative to Submarine Cable Requirements

For comparison with requirements for a satellite alternative to the cable, we will first remove the TV from consideration. This is because Christmas Island would receive existing television services from the various satellites visible, and would not need to pay for dedicated satellite television capacity.

Next, we need to consider whether the remaining requirements are full duplex (two-way) or only half duplex (one-way), and if full duplex whether the requirement in each direction is symmetrical On a cable, capacity is always allocated in symmetrical full duplex circuits. However on a satellite, each direction is dealt with separately.

From the requirements in the above table, telephony is always symmetrical full duplex, but internet/health/education are usually heavily skewed with a higher rate on the download direction. And TV is always half duplex. And we will assume that the offshore business is also asymmetric, but maybe not so much as internet.

If we assume that internet/health/education is skewed 4:1 in favour of downloads, offshore business 2:1, and ignore the television requirements, we end up with the summary of satellite capacity required shown in the following table. As noted in section 4 above, for large enough antennas, one can obtain a conversion of 0.6MHz of satellite bandwidth for each 1Mb/s of data rate. And assuming a favourable C-band space segment cost of around US$2,500/MHz/month.

Equivalent Satellite Requirement

		2009	2010	2011	2012	2013	2014	2015	2020	2025
Downlink Direction										
Telephony/Internet	(Mb/s)	2.5	5	8.8	14	21	29	38	142	527
Health Link	(Mb/s)		45	45	45	45	45	155	155	155
Education Link	(Mb/s)		45	45	45	45	45	155	155	155
Offshore Business	(Mb/s)		20	24	29	35	41	50	124	308
Uplink Direction										
Telephony/Internet	(Mb/s)	2.5	2.5	2.5	3.5	5.25	7.25	9.5	35.5	131.75
Health Link	(Mb/s)		11.25	11.25	11.25	11.25	11.25	38.75	38.75	38.75
Education Link	(Mb/s)		11.25	11.25	11.25	11.25	11.25	38.75	38.75	38.75
Offshore Business	(Mb/s)		20	24	29	35	41	50	124	308
Total Satellite Data	**(Mb/s)**	5	160	171.8	188.0	208.8	230.8	535.0	813.0	1662.3
Total Satellite BW	**(MHz)**	3	96	103.1	112.8	125.3	138.5	321.0	487.8	997.4
Number of equivalent 36MHz satellite transponders		0.1	2.7	2.9	3.1	3.5	3.8	8.9	13.6	27.7
Space Segment Cost estimated in US$,000 per month		**7.5**	**240**	**258**	**282**	**313**	**346**	**803**	**1,220**	**2,493**

It is quite reasonable to assume that one might be able to acquire 4 to 5 transponders worth of capacity on a single satellite. So in the years until 2014 a single large C-band facility is probably sufficient, at an initial capital cost of US$500,000 from section 5.2 above.

However, in later years if these forecast requirements are accurate, then access to multiple satellite would be required. An additional satellite facility costing US$500,000 each would be required by 2015 and another by 2020. By 2025 the traffic forecast is more than enough to fill one fully dedicated satellite.

Just for comparison, the cost to procure and launch a whole satellite is currently approximately US$200M,including launch insurance, with a design life of each satellite on the order of 15 years maximum.

7. References

1. Joint Standing Committee on the National Capital and External Territories, "*Island to Islands: Communications with Australia's External Territories*", © Commonwealth of Australia, March 1999.

2. Singtel Optus Pty Ltd, "*D1 Satellite Payload Information*", February 2007.

8. Contact Details

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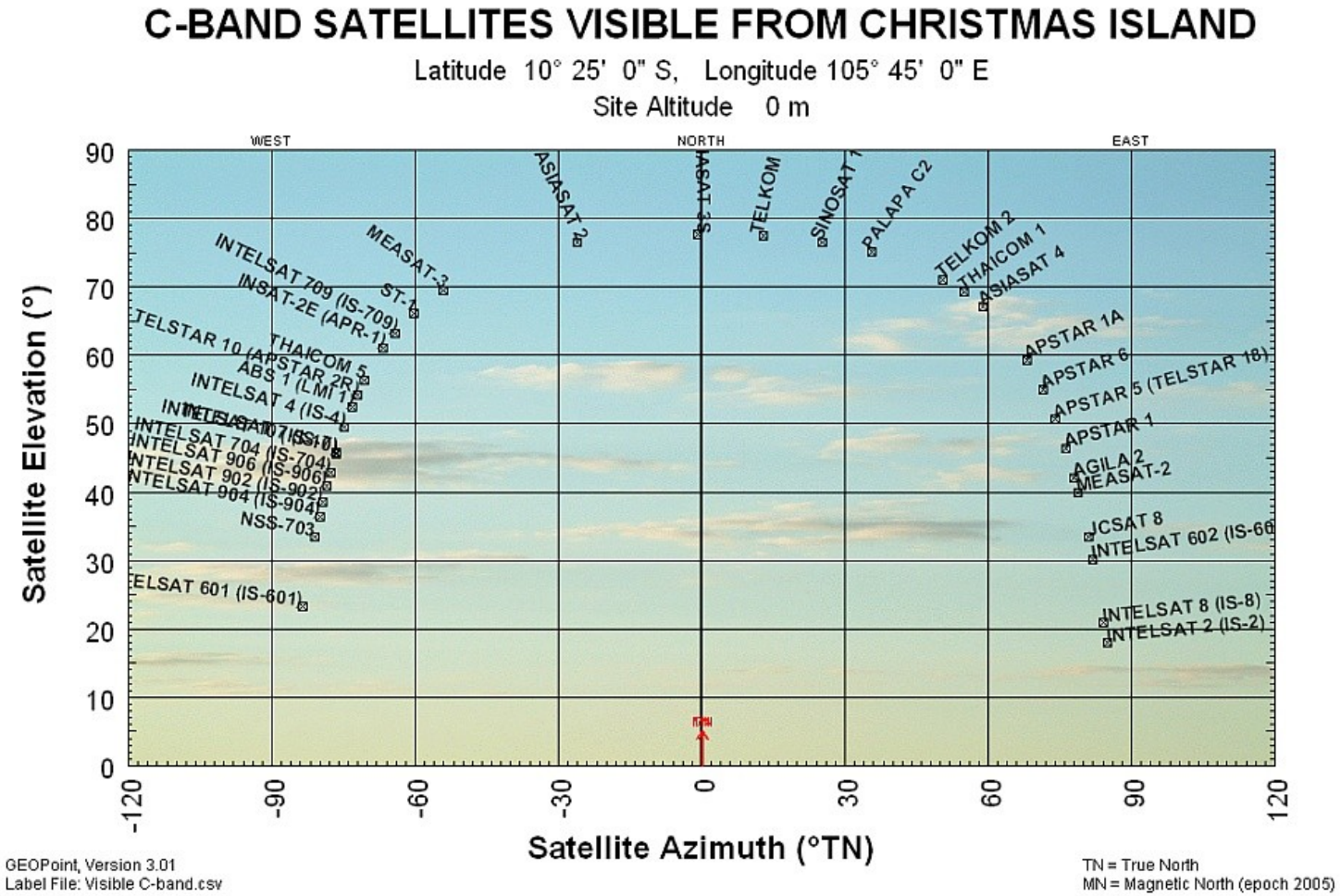
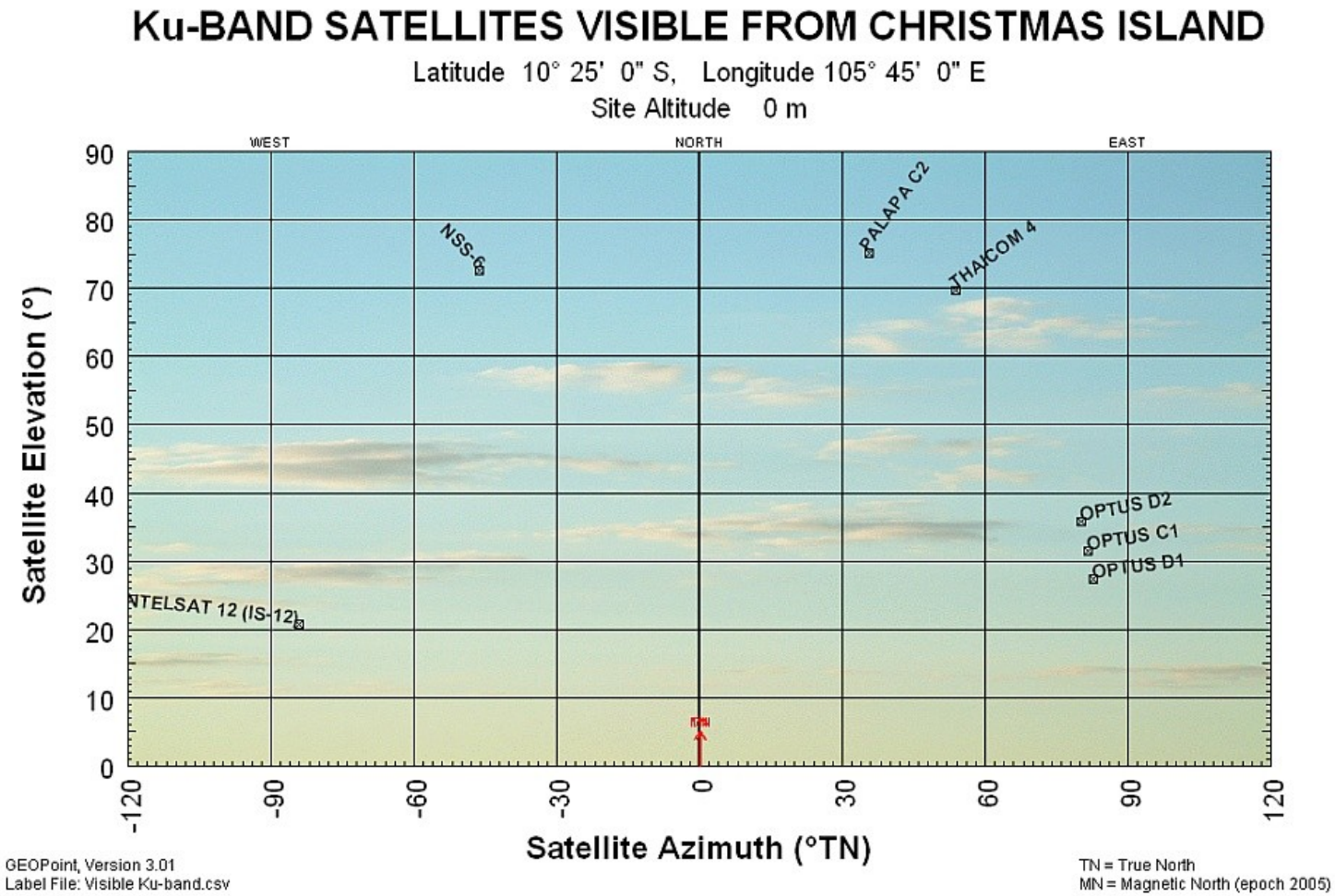
Email: ghausfeld@ieee.org

-- END --

ATTACHMENT 1 – Satellite Visibility from Christmas Island.




Ku-BAND SATELLITES VISIBLE FROM CHRISTMAS ISLAND
Latitude 10° 25' 0" S, Longitude 105° 45' 0" E
Site Altitude 0 m
WEST
NORTH
EAST
Satellite Elevation (°)
90
80
70
60
50
40
30
20
10
0
NSS-6
PALAPA C2
JCSAT 4
OPTUS D2
OPTUS C1
OPTUS D1
NTELSAT 12 (IS-12)
-120
-90
-60
-30
0
30
60
90
120
Satellite Azimuth (°TN)
GEOPoint, Version 3.01
Label File: Visible Ku-band.csv
TN = True North
MN = Magnetic North (epoch 2005)

Satellite Pointing Angles from Christmas Island

Satellite	Location	Frequencies	Pointing Angles	
			Azimuth	Elevation
ABS 1 (LMI 1)	75.0	C	286.9	52.5
AGILA 2	146.0	C	78.0	42.1
APSTAR 1	142.0	C	76.3	46.3
APSTAR 1A	130.0	C	68.2	59.2
APSTAR 5 (TELSTAR 18)	138.0	C	74.1	50.6
APSTAR 6	134.0	C	71.5	55.0
ASIASAT 2	100.5	C	333.9	76.4
ASIASAT 3S	105.5	C	359.2	77.8
ASIASAT 4	122.5	C	58.9	67.1
INSAT-2E (APR-1)	83.0	C	293.4	61.0
INTELSAT 10 (IS-10)	68.5	C	283.4	45.6
INTELSAT 12 (IS-12)	45.0	Ku	275.8	20.8
INTELSAT 2 (IS-2)	169.0	C	84.8	17.9
INTELSAT 4 (IS-4)	72.0	C	285.2	49.4
INTELSAT 601 (IS-601)	47.5	C	276.4	23.3
INTELSAT 602 (IS-602)	157.0	C	81.8	30.2
INTELSAT 7 (IS-7)	69.0	C	283.5	45.8
INTELSAT 704 (IS-704)	66.0	C	282.3	42.9
INTELSAT 709 (IS-709)	85.0	C	295.8	63.3
INTELSAT 8 (IS-8)	166.0	C	84.2	20.9
INTELSAT 902 (IS-902)	62.0	C	280.7	38.6
INTELSAT 904 (IS-904)	60.0	C	280.0	36.5
INTELSAT 906 (IS-906)	64.0	C	281.6	40.9
JCSAT 8	154.0	C	80.9	33.5
MEASAT-2	148.0	C	78.8	39.9
MEASAT-3	91.5	C	305.8	69.6
NSS-6	95.0	Ku	313.8	72.6
NSS-703	57.0	C	279.1	33.4
OPTUS C1	156.0	Ku	81.5	31.6
OPTUS D1	160.0	Ku	82.6	27.4
OPTUS D2	152.0	Ku	80.2	35.8
PALAPA C2	113.0	C, Ku	35.5	75.1
SINOSAT 1 (XINNUO 1)	110.5	C	25.2	76.5
ST-1	88.0	C	299.7	66.2
TELKOM 1	108.0	C	12.8	77.5
TELKOM 2	118.0	C	50.5	71.1
TELSTAR 10 (APSTAR 2R)	76.5	C	288.0	54.2
THAICOM 1	120.0	C	55.0	69.2
THAICOM 4	119.5	Ku	53.8	69.7
THAICOM 5	78.5	C	289.5	56.4

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 3

The following question was submitted to the Attorney-General's Department on 29 October 2009:

3. What community consultation has taken place in relation to the delivery of digital television to the Indian Ocean Territories and have any conclusions been reached about switching to digital television?

The answer to the Committee's question is as follows:

Australian Government policy is for analogue television to be switched off by the end of 2013. The Attorney-General's Department retransmits television to the Indian Ocean Territories as a community service and is seeking to ensure that digital television will be available prior to the end of 2013.

Community consultation will occur as part of this process.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 4

The following question was submitted to the Attorney-General's Department on 29 October 2009:

4. What is being done to improve the mobile and non mobile telephony services for the Indian Ocean Territories?

The answer to the Committee's question is as follows:

Senior officials from the Attorney-General's Department and Telstra are visiting both Cocos (Keeling) Islands and Christmas Island in early November. They will consider options for improving the telephony services.

JOINT STANDING COMMITTEE ONTHE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 5

The following question was submitted to the Attorney-General's Department on 29 October 2009:

5. From March to May 2008 a short term subsidy was available for air freight during adverse weather conditions. Has any consideration been given to improving freight services through an ongoing subsidy?

The answer to the Committee's question is as follows:

An air freight subsidy was provided as a temporary measure in early 2008 when sea freight could not be transported during adverse weather conditions. A permanent air freight subsidy is a matter for the Department of Infrastructure, Transport, Regional Services and Local Government.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 6

The following question was submitted to the Attorney-General's Department on 29 October 2009:

6. What is the method by which Cocos (Keeling) Islands receives its television signal? Will this method be reviewed including consideration of installing improved infrastructure?

The answer to the Committee's question is as follows:

The digital television signal to the Cocos (Keeling) Islands is received by satellite. It is then decoded and distributed to both West Island and Home Island in an analogue format.

The Attorney-General's Department is seeking to ensure digital television will be available by the end of 2013 when analogue television is due to be switched off.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 7

The following question was submitted to the Attorney-General's Department on 29 October 2009:

7. Has the Department been approached by DEWHA in regard to the 2005 business case to establish an International Research Centre on Christmas Island? If so, what is the status of this proposal?

The answer to the Committee's question is as follows:

In 2005, the former Department of Transport and Regional Services engaged in informal discussions with the (then) Department of the Environment and Water Resources (DEWR) regarding the establishment of an International Research Centre on Christmas Island. We understand that a proposal is under review the Department of the Environment, Water, Heritage and the Arts. Questions about this proposal should be directed to the Department of the Environment, Water, Heritage and the Arts.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 8

The following question was submitted to the Attorney-General's Department on 29 October 2009:

8. What is the status of the proposed use of the former Christmas Island Casino?

The answer to the Committee's question is as follows:

The Attorney-General's Department met with Mr Kwon, leaseholder of the Christmas Island Resort and Casino site, on 30 October 2009. Both parties reached agreement on the Commonwealth's use of the Poon Saan Accommodation units and Christmas Island Resort.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 9

The following question was submitted to the Attorney-General's Department on 29 October 2009:

9. Has the Department been approached by the Shire of Christmas Island or have any discussions taken place with the Shire Council in regard to funding a local policy officer position which would be responsible for planning, research and policy development at the local level? If so, what was the outcome of discussions?

The answer to the Committee's question is as follows:

The Attorney-General's Department has not received a formal request by the Shire of Christmas Island nor had any discussions regarding the funding of a local policy officer position.

Policy relevant to Christmas Island is developed by officers from the Attorney-General's Department, in consultation with other agencies. Regular visits are made to Christmas Island to consult with the Shire of Christmas Island and Christmas Island residents.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 10

The following question was submitted to the Attorney-General's Department on 29 October 2009:

10. Are there any officers from the Attorney-General's Department permanently residing on Cocos (Keeling) Islands? If not, what arrangements are in place for residents of Cocos (Keeling) Islands to be able to access the Attorney-General's Department?

The answer to the Committee's question is as follows:

The Attorney-General's Department does not have a departmental officer deployed permanently to the Cocos (Keeling) Islands. An Australian Government representative is located permanently on the Cocos (Keeling) Islands. This officer reports to the Administration Office on Christmas Island, and is primarily responsible for all housing matters.

Residents of the Cocos (Keeling) Islands can access the Attorney-General's Department through regular visits by staff from both the Canberra and Perth offices as well as phone, email and facsimile contact.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 11

The following question was asked by Senator CROSSIN:

Senator CROSSIN: Perhaps you could provide that submission [to the Coastal Shipping Inquiry] to us as well.

The answer to the Committee's question is as follows:

The submission from the Attorney-General's Department to the Coastal Shipping Inquiry is included at ***Attachment A***.

Australian Government

Attorney-General's Department

SUBMISSION TO THE INQUIRY INTO COASTAL SHIPPING POLICY AND REGULATION

HOUSE STANDING COMMITTEE ON INFRASTRUCTURE, TRANSPORT, REGIONAL DEVELOPMENT AND LOCAL GOVERNMENT

Territories and Native Title Division
Attorney-General's Department
April 2008

Indian Ocean Territories

Background

The Indian Ocean Territories (IOT) of Christmas Island and the Cocos (Keeling) Islands are non-self governing territories of Australia. Christmas Island is located approximately 2,600 kilometres north-west of Perth and 360 kilometres south of Java and has a population of approximately 1350. The Cocos (Keeling) Islands are located approximately 2,770 kilometres north-west of Perth and 900 kilometres south-west of Christmas Island and have a population of approximately 570.

2. Shipping is the major goods link to the IOT, with food, consumer goods, some fuel and plant equipment all transported to the IOT by ship. The IOT are exempt from the coasting trade requirements in the *Navigation Act 1912* (Cth). This allows ships to engage in trade between the mainland and the IOT and within the IOT without a licence or permit for coastal shipping.

3. Cargo shipped to the IOT is unloaded at Commonwealth-owned ports at Flying Fish Cove on Christmas Island and Home Island in the Cocos (Keeling) Islands. Both ports are managed under contract by Toll Ports and are regulated through Commonwealth and applied Western Australian legislation. The current port management contract expires on 30 June 2008 and an open approach to market for port management services will be undertaken soon. In 2007, 5,147 tonnes of containerised cargo was unloaded at Christmas Island and 2,061 tonnes of containerised cargo was unloaded at Cocos (Keeling) Islands.

4. Christmas Island port experiences significantly higher traffic than the Cocos (Keeling) Islands port, as it is used to load phosphate onto ships for export. During 2007, 86 phosphate ships were loaded at Christmas Island port. Major construction projects on Christmas Island, such as the Immigration Detention Centre, have temporarily increased the amount of cargo being loaded and unloaded at this port. Much of this cargo arrived from South-East Asia and did not constitute coastal shipping.

5. In 2007 the Australian Government approved the construction of a new passenger and freight handling facility at Rumah Baru in Cocos (Keeling) Islands. The project is scheduled for completion by the end of 2009 and will significantly improve freight and passenger handling.

6. The Commonwealth aims to keep the port fees low to keep the costs of shipping down. At Christmas Island Port there are additional costs for stevedoring, pilotage, demurrage and hiring which are currently $560 for a full container and $240 for an empty container. At Cocos (Keeling) Islands Port there is an additional cost for equipment hire.

7. The only regular cargo service to the IOT is operated by Zentner Shipping Pty Ltd. The Zentner-operated "Island Express" sails from Fremantle to Christmas Island and the Cocos (Keeling) Islands every four to six weeks. The current cost to ship a 20 foot general purpose container to Christmas Island is $6,475 and to the Cocos (Keeling) Islands is $9,880. These costs include packing, delivery, port and wharf charges and stevedoring. Zentner also imposes a service charge for Christmas Island. This has recently been increased to $810 and takes into account costs associated with additional vessel hire, fuel usage and other operating costs caused by weather delays affecting vessel operations at Christmas Island.

8. Although it is an open market, Zentner Shipping Pty Ltd is the only operator providing shipping services to the IOT. The Government encourages competition in this market; however its small size and value make it unattractive to many shipping operators.

Previous reviews of the Indian Ocean Territories' shipping services and infrastructure

9. In 1995, the Joint Standing Committee on the National Capital and External Territories produced a report entitled "Delivering the Goods", which inquired into the current and future freight options for Christmas Island, the Cocos (Keeling) Islands and Norfolk Island. The report contains a detailed history of the shipping practices in these locations.

10. In its 2006 report "Inquiry into current and future governance arrangements in the Indian Ocean Territories", the Joint Standing Committee on the National Capital and External Territories recommended that the Government investigate the cost of sea freight to the IOT with a view to reducing costs and streamlining operations. The previous Government did not agree with this recommendation.

Discussion

11. Regular commercial shipping is a vital transport link for the IOT and essential to the viability of the IOT communities.

a. Commercial shipping is the major carrier of essential supplies including food and consumer goods. The existence of the IOT communities is heavily reliant on regular and reliable supply of these goods via ship. Any decrease in service is likely to have an adverse effect on the communities and may lead to shortages of essential supplies.

b. Shipping has been identified as a major underlying cost of almost all economic activity in the IOT. The IOT economies are small and particularly vulnerable to cost increases. Economic growth is closely linked to the affordability of shipping services as many inputs for local businesses are shipped from the mainland. A decrease in service and/or an increase in shipping costs is likely to have a substantial, adverse effect on the IOT economies.

c. The IOT are of considerable strategic interest to the Australian Government due to their locations, populations and available infrastructure. Commercial shipping is used by the Government to move assets to and from the IOT. Supplies and plant for minor construction work and asset maintenance are transported via the regular shipping service. A reduction in this service would make it more difficult for the Government to execute essential functions in the IOT.

12. For the reasons identified in paragraph 10, it is necessary that the IOT continue to be serviced by a regular, reliable and affordable shipping service. It is also important for the IOT to have access to ad hoc shipping arrangements where there is an urgent and critical need for shipping capacity which cannot be met by the regular shipping service. For example, in the aftermath of a natural disaster, large quantities of supplies, machinery and other equipment may need to be shipped to the IOT. Any reform of coastal shipping regulation should consider these needs.

Norfolk Island

Background

13. Norfolk Island has been an integral part of Australia since 1914 when the Norfolk Island Act 1913 effected the acceptance of the Territory under section 122 of the Australian Constitution. Norfolk Island is one of Australia's most geographically isolated territories.

14. All external Territories are integral to Australia, although successive Australian Governments have endorsed particular legislative or administrative arrangements which differ from those applying elsewhere in Australia. In Norfolk Island's case, the current self government arrangements are the result of a decision by the Federal Parliament and given effect by the *Norfolk Island Act 1979* (Cth). The Parliament's plenary powers in relation to Norfolk Island were confirmed in April 2007 by the High Court decision of *Bennett v Commonwealth of Australia*.

15. Under Norfolk Island's self-government arrangements, the Norfolk Island Government is responsible for transport infrastructure including freight and passenger services to and from the Island. As with other Australian State or Territory Governments, the Norfolk Island Government is eligible to apply to the Australian Government for specific purpose loans or grants to fund infrastructure-related developments on Norfolk Island. For example, in 2005 the Australian Government provided Norfolk Island with an interest free loan of $12 million to assist with the upgrading of the Norfolk Island Airport.

16. Tourism forms the basis of the Island's economy and is heavily dependent on the economic situation on the Australian mainland and in New Zealand. Norfolk Island received 34,358 tourists in 2006-07 and is working to increase visitor numbers to 41,000 during 2007-08.

17. Similar to the IOT, Norfolk Island is exempt from the coasting trade requirements in the *Navigation Act 1912* (Cth). This allows ships to engage in trade between the mainland and Norfolk Island without a licence or permit for coastal shipping.

Previous reviews of Norfolk Island's shipping services and infrastructure

18. Norfolk Island's shipping services and infrastructure needs have been addressed in a number of reports, including:

- *Delivering the Goods*, the February 1995 report by the Joint Standing Committee on the National Capital and External Territories (JSC),
- the Commonwealth Grants Commission's 1997 *Report on Norfolk Island,*
- *Making Ends Meet: Inquiry into commercial regional aviation services in Australia and alternative transport links to major populated islands*, the November 2003 report by the House of Representatives Standing Committee on Transport and Regional Services (the predecessor of the current Committee), and
- *Norfolk Island Financial Sustainability: The Challenge – Sink or Swim*, the JSC's November 2005 report.

19. All of those reports have acknowledged that Norfolk Island is largely dependent on shipping services for the delivery of goods. Continued access to sea transport is therefore crucial to maintaining the viability of the Island's community and its tourism industry.

20. The 2003 report, *Making Ends Meet*, by the predecessor of the current Committee included two Norfolk Island shipping-related recommendations.

- The Committee recommends that, as per the findings of the Commonwealth Grants Commission, Norfolk Island receive Commonwealth assistance in upgrading or renewing its shipping infrastructure facilities (recommendation 12).
- The Committee recommends that the Commonwealth Government accept the recommendations outlined in the Delivering the Goods report by the Joint Standing Committee on the National Capital and External Territories, especially in respect of the an appropriate subsidised vessel for heavy freight (recommendation 13).

21. The previous Government's May 2007 response to the recommendations was as follows:

Recommendation 12

The Government notes this recommendation

The Australian Government provided $6.36 million to the Norfolk Island Government over the 2005-06 and 2006-07 financial years to refurbish the Kingston Pier in keeping with the pier's heritage qualities and position as a key loading and unloading point for the Norfolk Island community.

The Australian Government investigated alternative governance models for Norfolk Island in 2006. It decided not to change governance arrangements on Norfolk Island as it considered that changes could impose significant disruption to the fragile economy and also took into account the efforts of the Norfolk Island Government increase revenue and promote tourism growth. Shipping and the delivery of goods to Norfolk Island remain matters for the Norfolk Island Government.

Recommendation 13

The Government does not accept this recommendation.

In the absence of a port facility on Norfolk Island this recommendation is not considered practical at this time.

22. These issues have not been revisited by the Australian Government since that response.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 12

The following question was asked by Senator LUNDY:

Senator LUNDY: Are you able to provide to the committee correspondence to that effect from the department to the appropriate regulatory authority [the National Aviation Policy Statement]?

The answer to the Committee's question is as follows:

The submission from the Attorney-General's Department to the National Aviation Policy Statement is attached at ***Attachment A***.

Australian Government

Attorney-General's Department

AVIATION POLICY AND THE INDIAN OCEAN TERRITORIES

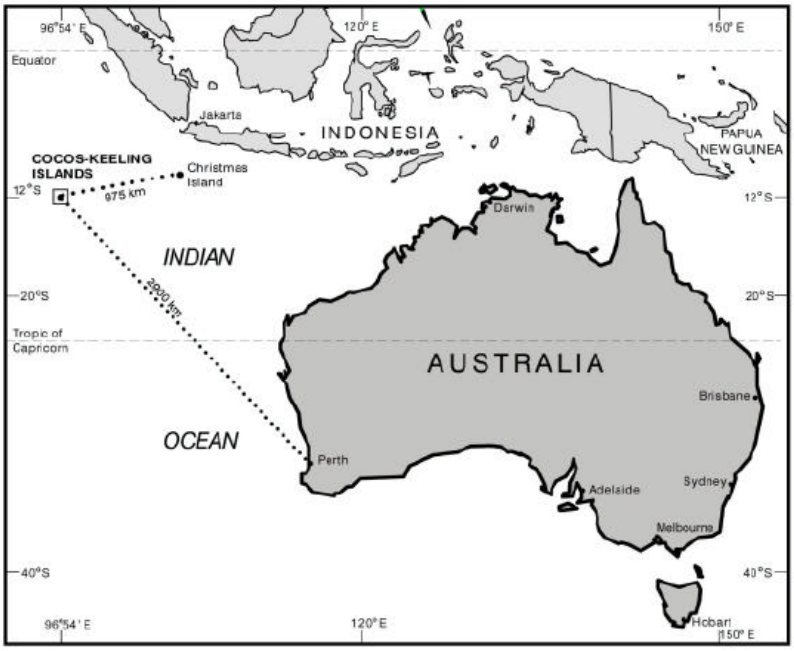
SUBMISSION TO THE NATIONAL AVIATION POLICY STATEMENT

Territories and Native Title Division
Attorney-General's Department
June 2008

That an exemption be granted to allow foreign airlines to operate a loop between Christmas Island, the Cocos (Keeling) Islands and destinations in South East Asia.

Background

The Indian Ocean Territories (IOT) of Christmas Island and the Cocos (Keeling) Islands are non-self governing territories of Australia. Christmas Island is located approximately 2,600 kilometres north-west of Perth and 360 kilometres south of Java and has a population of approximately 1350. The Cocos (Keeling) Islands are located approximately 2,770 kilometres north-west of Perth and 900 kilometres south-west of Christmas Island and have a population of approximately 570.



2. Air services are a vital transport link for the IOT. Air freight delivers mail, perishable and other time-sensitive goods. Air is the sole method of passenger travel. Air transport is a major economic driver and is used for the delivery of many government services.

3. The IOT's primary air link is south to Perth. National Jet Systems operates twice weekly between Perth, Christmas Island and the Cocos (Keeling) Islands. The service alternates between a clockwise and anti-clockwise loop. A return economy air fare from Perth to the IOT is **$2,048**.

4. The southern air link is the only passenger service between the IOT and mainland Australia. It is used by government service providers, domestic tourists and IOT residents visiting the mainland. The southern link is used for the regular delivery of mail and air freight. It is used for patients travelling to Perth for routine medical care and, in some cases, for medical evacuations.

5. Christmas Island also receives a weekly flight from Kuala Lumpur, Malaysia. This flight is operated by Malaysia Airlines. It replaced a service operated by Austasia Airlines between Singapore and Christmas Island. The Austasia Airlines service operated from 2 February 2006 until 31 May 2008, when it ceased for financial reasons. A return economy airfare from Kuala Lumpur to Christmas Island is **$840**.

6. The northern air link is an important economic driver for Christmas Island. It is a short flight from South East Asia to Christmas Island and this service is used predominantly by international tourists and business travellers. This flight carries a significant amount of freight and provides essential access to international markets.

7. Demand for the northern route varies widely depending on a number of factors. Many Christmas Islanders travel to South East Asia for Chinese New Year and other cultural holidays. Incoming tourist numbers increase for events such as Bird Week and during holiday periods. Business travel levels often reflect the specific projects being carried out on Christmas Island. The construction of the Immigration Detention Centre between 2002 and 2007 provided a significant boost to business travel on this route.

8. The northern link between the IOT and South East Asia will continue to play an important role in the development of the IOT communities. The IOT have considerable strategic value for the Australian Government. Maintaining healthy and vibrant communities in the IOT is an essential step in safeguarding this interest.

9. The flight between Christmas Island and South East Asia provides economic opportunities for the Island, particularly in tourism and other service industries. As the IOT move away from reliance on phosphate mining for economic stability, these industries will become more important and provide a greater proportion of local employment.

10. The northern flight also allows IOT residents to maintain cultural links with South East Asia. Sixty percent of the IOT population have family, social and cultural links with South East Asia. Many speak Malay or Chinese as a first language.

Government Support

11. The policy of successive Australian Governments has been to provide the IOT communities with access to a similar range and quality of services as are available in remote communities in mainland Australia. As part of this policy, the Government supports the development of sustainable economies in the IOT.

12. As air transport plays a significant role in both economic development and service delivery in the IOT, the Australian Government provides infrastructure for these services. The Government owns airports on Christmas Island and the Cocos (Keeling) Islands, which are operated under contract by Forte Airport Management. The Government also provides a range of ground equipment to assist airlines servicing the IOT.

13. Since 1997, the Australian Government has also offered financial support for air services to the IOT. The Government underwrites the southern air link through a contract with National Jet Systems. The contract allows for the Government to provide funding to National Jet Systems if its profit from this service falls below a set level. This policy is consistent with Australian Government support for other remote air services on the mainland. It is also consistent with Western Australian Government subsidies for intra-state air services to remote WA communities.

14. The contract with National Jet Systems is due to expire on 31 March 2009. As part of the re-tendering process, the Government is considering whether additional financial support could be provided for the northern air link. Given the varying commercial viability of this link and its importance for the IOT economies, this is a prudent option to consider.

Cabotage

15. The current Australian Government aviation policy prevents foreign air carriers from operating domestic services. This prohibition includes operating a loop between Christmas Island, the Cocos (Keeling) Islands and any destination in South East Asia.

16. The Government is seeking to ensure the operation of the northern air link is sustainable and reliable. There are few domestic Australian airlines that operate internationally and are capable or interested in flying this route. To ensure a regular service is maintained, it is vital that major regional airlines are able to fly this route, regardless of their ownership.

17. The Attorney-General's Department proposes that an exemption to the current policy be created to allow foreign airlines to fly between Christmas Island, the Cocos (Keeling) Islands and destinations in South East Asia.

18. There are a range of factors which justify an exemption of this nature:

a. The IOT's distance from mainland Australia and proximity to South East Asia make them unique remote communities. No Australian communities are further removed from the mainland and yet closer to major South East Asian centres. A northern air link provides cheaper and more convenient travel than its southern counterpart. For these reasons, it is the preferred choice for many business travellers and tourists.

b. The IOT's remoteness and status as "external territories" effectively separate them from other domestic air services. The IOT enjoy different quarantine and customs status to mainland Australia. They are GST and excise free. Flights from mainland Australia to the IOT depart from the international terminal of Perth airport and are subject to similar processing to international flights. Passengers travelling from mainland Australia to the IOT are required to complete outgoing passenger cards, just as if they were travelling to another country.

c. A failure of the northern air link would have significant detrimental effects on the IOT communities. Economic activity in the IOT would be significantly reduced, particularly in the tourism sector. The IOT would be cut-off from South East Asian and other international markets. Air freight would be limited to the capacity of the southern air link and people travelling to South East Asia would have to fly via Perth, making travel prohibitively expensive.

d. An exemption would be consistent with Australian Government policies to support air services to remote communities where these would not ordinarily be commercially viable. The Government currently provides financial support for services to many remote communities. Financial support may not be sufficient to sustain a northern air link to the IOT as many airlines are ineligible to fly this route.

Increasing the number of airlines eligible to fly this route would effectively complement financial support for a northern link.

e. The inability of individual sectors to support air services indicate they should be combined to ensure a more reliable service. For example, a regular flight between South East Asia and the Cocos (Keeling) Islands is unlikely to generate sufficient demand to remain profitable. If this route were combined with a service to Christmas Island, the combined demand of both destinations would be more likely to realise a viable service.

f. The inability of Australian carriers to provide this route suggests consideration should be given to allowing foreign carriers access. Regional international airlines are better placed to provide this service as it is likely that an aircraft operating the northern link will be based in South East Asia.

g. Traditional justifications for cabotage restrictions do not readily apply to the IOT. For example, the safety considerations that prevent foreign carriers from operating domestic routes do not have practical consequences for the IOT. The same airline and aircraft that operates the northern link to Christmas Island is also entitled to operate a direct flight to the Cocos (Keeling) Islands.

JOINT STANDING COMMITTEE ON THE NATIONAL CAPITAL AND THE EXTERNAL TERRITORIES

ATTORNEY-GENERAL'S DEPARTMENT

Question No. 13

The following question was asked by Senator LUNDY:

Senator LUNDY: It would be beneficial for the committee if you could report back the outcomes of that meeting [between the Attorney-General's Department and Mr Kwon] if they are publicly reportable.

The answer to the Committee's question is as follows:

The Attorney-General's Department met with Mr Kwon on 30 October 2009. Both parties reached agreement on the Commonwealth's use of the Poon Saan Accommodation units and Christmas Island Resort.