

TransACT Capital Communications

Pty Ltd

Submission on

Backhaul Blackspots Initiative

Stakeholder Consultation Paper

April 2009

Overview of the initiative

On 7 April 2009 the Australian Government announced it will establish a new company that will invest up to \$43 billion over eight years to build and operate a National Broadband Network (NBN) delivering superfast broadband to Australian homes and workplaces.

One of the immediate steps the Australian Government will take is to invest up to \$250 million to improve the supply of transmission services, also referred to as backhaul, to a number of regional centres where there is a lack of competitive backhaul services ('blackspots').

The Australian Government expects that its decision to invest in regional transmission services will:

- in the short to medium term, deliver an immediate economic stimulus;
- in the short to medium term, achieve better service outcomes for regional consumers, including reduced cost;
- in the medium to long term, contribute to the roll-out of the National Broadband Network; and
- contribute to other Australian Government initiatives such as the \$46 million Digital Regions Initiative, which is a key element of the Government's response to the Regional Telecommunications Review.

The Regional Telecommunications Independent Review Committee (RTIRC) address a number of issues in their report (Glasson Report)¹ to the Government concerning the future needs of rural and regional Australia. The Glasson Report provided significant findings and recommendations in relation to backhaul including,

- Finding 2.5.2: Opportunities to improve services in regional areas are impeded by the lack of available backhaul at appropriate prices to enable competitive retail services.
- Finding 2.5.3: The Government does not have information on where or how much backhaul transmission is available. The ACCC issued a Record Keeping Rule in December 2007 to obtain this information. This data is not publicly available and has not been available to the Committee.
- Finding 2.5.4: The Committee found backhaul inadequate in regional Australia.
- Finding 2.5.8: The extension of backhaul in conjunction with the NBN should make further investment in backhaul beyond the NBN viable as a commercial proposition or from additional government programs.
- Finding 2.5.9: The telecommunications access regime and current market structure may be contributing to backhaul inadequacy for regional Australia.

¹ <http://www.rtirc.gov.au/>

It can be seen from the Glasson Report and the associated findings on backhaul, that the future provision of backhaul will form an important framework for the National Broadband Network, the Australian Broadband Guarantee and Clever Networks, the Digital Regions Initiative, the Digital TV Switchover, the Indigenous Communications Program and other telecommunications initiatives introduced by the Australian Government.

Executive summary

TransACT Capital Communications Pty Ltd (TransACT) is pleased to make this submission in response to the Australian Government's commitment to move quickly and address backhaul blackspots in regional Australia.

Since 2001 TransACT has been rolling out a fibre-optic network in the Australian Capital Territory (ACT) to provide Canberra and Queanbeyan with the next generation of communication services. TransACT is a "true believer" in open access networks. TransACT's original mission was to be a wholesale-only broadband access network provider and at its launch in 2000, TransACT was and still is an open access network. The Government's announcements to invest up to \$43 billion over eight years to build and operate a "wholesale only" NBN and to immediately invest up to \$250 million to improve the supply of transmission services, endorses TransACT's original mission.

TransACT has successfully built, and operates, markets and supports a rich array of retail and wholesale telecommunication services. TransACT offers a comprehensive selection of telecommunications products and services including:

- fixed line and mobile telephony;
- high speed broadband;
- broadcast subscription television services featuring a wide choice of channels; and
- demand based video featuring a wide variety of content.

TransACT works with a range of service and content providers in order to deliver a diverse range of communications services. Currently ten ISPs partner with TransACT to offer broadband ISP services to customers through the TransACT network. In addition, TransACT also provides retail ISP services to customers through its joint venture entity, Grapevine Ventures.

TransACT direct-connect services are now available to over 100,000 premises across the ACT and Queanbeyan. A complete local and long distance phone service is also available in Sydney and south-east NSW including Bega, Berridale, Bombala, Crookwell, Cooma, Goulburn, Gunning, Nowra, Thredbo village and Yass. TransACT also provides its TransMOBILE (mobile telephony) service covering 94% of the Australian population, which is also complemented with its national broadband product through Grapevine Ventures.

Neighbourhood Cable Pty Ltd (NCPL), another wholly owned subsidiary of TransACT's parent company (TransACT Communications Pty Limited), is also investing significantly in the

provision of broadband infrastructure, products and services to other areas of Regional and Rural Australia. NCPL is an advanced telecommunications company servicing the Victorian regions of Ballarat, Mildura and Geelong. Committed to delivering high-speed cable broadband and entertainment services to regional Australia, NCPL began rolling out a hybrid fibre and coaxial (HFC) network in 1997. Starting in Mildura and later expanding to Ballarat and Geelong, the Neighbourhood Cable network now reaches over 90,000 households across the three regions.

TransACT agrees that in regional areas where competing backhaul networks are not present there is little pressure on a supplier to offer low prices and higher quality services. This means that Internet Service Providers (ISPs) and other service providers are constrained in making new services available to consumers in these areas at competitive prices, when compared to similar locations that have alternative backhaul supply options.

It has long been acknowledged that monopolist backhaul has restricted broadband expansion and competition to areas of rural and regional Australia. TransACT supports the Australian Government's initiative to improve the supply and lower the cost of regional backhaul services.

Issues for consultation

Locations

Priority locations

Since 2001, TransACT has been a facilities-based market operator owning its own network which it uses to provide telecommunications products and services to its customers.

TransACT has also observed that until now, backhaul has been a primary limitation of facilities-based competition. With more competitive, reliable and reasonably priced backhaul, TransACT and NCPL could offer a range of quality products and services to consumers in new and different regional areas; while delivering significant savings and value to end users.

If quality and reasonably priced backhaul was available; TransACT would immediately consider expanding its infrastructure investments (DSLAMs) and market presence within NSW to Yass, Harden, Boorowa, Goulburn, Cooma, Bombala, Jindabyne and the entire South Coast of NSW. These have until now been considered too expensive to pursue. TransACT has a close partnership with ActewAGL and the two organisations participate in the market together primarily within the ActewAGL marketing region (see attachment one). With ActewAGL, TransACT could deliver market leading, bundled products and services (and significant benefits and savings) to consumers in these areas. A TransACT and ActewAGL bundled service offering provides consumers with the opportunity to bundle their electricity, natural gas or broadband internet and phone services. Offering bundled products and services to consumers in these areas would not only increase competition but would also provide opportunities for new products and real savings to consumers. Until now the key limiting factors pertaining to TransACT entering these markets have been the availability of reasonably

priced backhaul; and the current pricing arrangements for Band 3 and Band 4 Telstra ULL (Unconditioned Local Loop). TransACT notes even at the current ULL Band 3 price of \$31.30; Digital Subscriber Line Access Module (DSLAM) deployment may be economically viable if reasonably priced backhaul was available. Backhaul investment in the right locations could well lead to a further expansion of DSLAM deployment and ADSL2+ coverage during the transitional period prior to commissioning of the NBN. In fact, both iiNet and Internode have been recently quoted as saying that they will continue to roll-out ADSL2+ infrastructure.

For NCPL, **Mildura** is a particular priority given that there is currently uneconomic backhaul supply; there are frequent backhaul outages and lack of diversity. Yet there is a large existing customer base in the area. With a more reasonably priced and reliable backhaul supply, NCPL would consider expanding further into the regions surrounding Ballarat, Geelong and Mildura. NCPL passes some 90,000 homes in Victoria with its HFC network, yet finds it extremely difficult to source reasonably priced and reliable backhaul to Mildura, which ultimately damages the quality of products and services that it provides in that area. The costs are prohibitive given that there is currently only one supplier - if there were more options available, NCPL would have already rolled out its products and services in additional locations.

Possible routes

Identifying possible routes for the provision of backhaul links to priority locations can be a complex task and would most likely require further detailed design and planning analysis. There are many factors which need to be considered including, without limitation:

- investigating opportunities to utilise capacity on existing fibre optic and terrestrial networks (long-haul microwave) as access points for new links and tails;
- the availability and access to existing infrastructure assets for the provision of both fibre optic and microwave backhaul (eg. ducts, poles, transmission lines for fibre optic deployment and communications towers for microwave backhaul);
- assessing terrain for routes of most practical and economic deployment where provision of new fibre optic backhaul (civil works) is to be provided; and
- assessing routes where provision of new fibre optic backhaul (civil works) is to be provided that ensures the lowest impact on the environment and indigenous land use issues.

Constructing backhaul links can sometimes require hundreds of different land access agreements and be subject to a number of different environmental processes. The legalities can be quite complex and should not be rushed, without due consideration. The Australian Government may need to look at overriding various state environmental and indigenous ownership laws, which could take some time to implement. The better alternative would be to identify proposed routes for priority locations as quickly as possible and enter into consultation to make the required arrangements with the states, territories, local governments and associated organisations to expedite approval processes.

Market Clarity's recent publication, ***Australian Telecom Infrastructure Atlas 2009***², comes in the form of a presentation-style report. The report contains 341 maps of backhaul fibre, microwave, DSLAMs and Fixed Wireless Broadband infrastructure from Market Clarity's extensive **Telecoms Infrastructure Database** covering national, state and capital city inner and outer metro areas.

The ***Australian Telecom Infrastructure Atlas 2009*** is delivered in Adobe PDF-format. Each map within the Atlas is provided in Medium Resolution format (approximately 1280 x 800 pixels), with telecom infrastructure overlaid on population density or street maps.

As reported by Business Spectator, the atlas shows that Victoria has the most vigorous telecoms competition in rural areas thanks to the backhaul provided by seven competitors of Telstra.

NSW has the next most vibrant backhaul competition, while Queensland has hardly any competition beyond the coastal areas. Tasmanian rural areas are shown to have very little backhaul competition.

The clear message from this report is that broadband competition is limited where ever there is a shortage of backhaul competition.

As part of further detailed design and planning analysis required by the Government, in scoping possible routes and priority locations that are lacking alternative backhaul, it would be useful to source and analyse this and other such publications to assist in this process.

The introduction of legislation to enable the Government to simplify and expedite land access arrangements for construction of backhaul infrastructure and to source further Network Information from existing Carriers and Backhaul Providers will also play a significant part to ensure that the Government can deliver significant benefits quickly and efficiently.

Contestable market

As indicated above, TransACT has a close partnership with ActewAGL; and the two organisations participate in the market together within the ActewAGL marketing region. Markets within this region would be considered contestable and if reasonably priced backhaul was made available, it would allow TransACT to increase competition providing opportunities for new products, services and real savings to consumers.

Wholesale price points to attract access seekers can vary based on a number of influencing factors. In most cases, where access seekers make commercial investments, business modelling includes inputs such as:

- critical mass;
- contestable market;
- Weighted Average Cost of Capital (WACC);

² <http://www.marketclarity.com.au/research/telecom-atlas-2009.cfm>

- period required for investment to return a positive Net Present Value (NPV);
- ULL Band pricing where DSLAM investments are being considered; and
- backhaul pricing.

The actual wholesale price points required to attract investment could be provided by TransACT, but this would require further detailed analysis. Different types of infrastructure investments, in different locations, may require wholesale price points for backhaul that vary dependant on the specific investment.

If in a given scenario backhaul pricing was equally competitive for a potential DSLAM deployment to a Band 3 Exchange Serving Area (ESA) and a Band 4 ESA; critical mass, contestable market and Band 4 pricing, could all impact on the viability of investing in the Band 4 ESA.

We can see differences in today's market between areas where broadband investments have been undertaken compared to other areas where little or no competitive investment exists. Benchmarking of wholesale backhaul price points in these areas would indicate where the price point is encouraging competition.

As mentioned above, **Mildura** is a particular priority for NCPL, given that there is currently uneconomic backhaul supply. Currently NCPL are paying up to ten times more for backhaul to Mildura compared to that between inter-capital and some major regional centres. This can be seen as the type of backhaul pricing that does not encourage competitive investment.

Given the announcement by the Government that the Victorian region surrounding Mildura will lead the way with Digital TV and analog switch-off in the first half of 2010, there may be opportunities to leverage the Digital TV Switchover, with new optic fibre and/or terrestrial backhaul links and the proposed National Broadband Network. Although Spectrum Licences are subject to a separate consultation paper issued by the Government³, the future allocation of spectrum will be important with respect to existing network providers, provision of regional backhaul, the NBN deployment and the future of Mobile and Wireless networks in Australia. It will be important to ensure that Spectrum Licences, particularly in the lower frequency ranges of below 10GHz, are allocated based on the prioritisation of services, and allocated spectrum is continually monitored for valid utilisation or reallocated appropriately.

As the cost of providing backhaul to regional and rural Australia can be significantly expensive, serious consideration needs to be given to unviable duplication of existing backhaul networks. The alternative may be to consider the effectiveness of current access arrangements to existing monopolist backhaul networks and introduce regulation of those networks rather than duplication. Additionally, augmenting to increase the capacity and reliability of existing backhaul networks would encourage competitive investment. These are issues which the Government may need to consider in line with the current Regulatory Reform for 21st Century Broadband discussion paper.

³ [Public Interest Criteria for re-issue of Spectrum Licences | Department of Broadband, Communications and the Digital Economy](#)

Design and operational parameters

Type and capacity of services

With regard to the type and capacity of services and associated operational arrangements that the network operator should provide to access seekers; TransACT believes that the latest generation of fibre based MPLS-enabled Ethernet services should form the basis of any transmission network (or otherwise prioritise technology that is capable of delivering video, voice and internet).

The Metro Ethernet Forum (MEF)⁴ is a global industry alliance comprising more than 145 organisations including telecommunications service providers, cable operators, MSOs, network equipment, test vendors, labs and software manufacturers, semiconductor vendors and testing organisations. The MEF develops technical specifications and implementation agreements to promote interoperability and deployment of Carrier Ethernet worldwide.

TransACT believes that future backhaul networks in Australia should be moving towards MEF standards and subsequently be MEF certified. Metro Ethernet is the new standard for Next Generation Networks (NGNs) and the mission of the Metro Ethernet Forum is ***“to accelerate the worldwide adoption of Carrier-class Ethernet networks and services.”***

The key objectives of the MEF are to:

1. build consensus and unite service providers, equipment vendors and end customers on Ethernet service definition, technical specifications and interoperability;
2. facilitate implementation of existing and new standards, Ethernet service definition, test procedures and technical specifications of the MEF to allow delivery of Ethernet services and make Carrier Ethernet-based core, metro and access networks truly carrier class; and
3. enhance worldwide awareness of the benefits of Ethernet services, enabled applications and Ethernet based networks.

To ensure sufficient bandwidth is available to encourage retail competition and innovation at the retail and applications layer, Gigabit Ethernet (Gig-E) and/or multiple Gig-E or 10Gig-E capacity should be provided where economically and technically viable.

Locations of Points of Interconnection (POI)

Today there are numerous types and locations for Carrier and Service Provider interconnection. POI can be defined as a physical point of connection in Australia between a network operated by a carrier or a carriage service provider and other network operated by a service provider.⁵

⁴ <http://metroethernetforum.org/index.php>

⁵ Definition from the ACCC Domestic Transmission Capacity Service Declaration 2009, <http://www.accc.gov.au/content/index.phtml/itemId/865757>

Interconnection is currently provided for switching of voice (telephony) calls between carriers for both domestic and international traffic. Interconnection is provided to the Telstra Unconditioned Local Loop (ULL) network at Telstra exchanges to enable service providers to install DSLAMs and deliver ADSL and ADSL2 services, ISP, Service Provider and Wholesale Layer2 DSL interconnection is provided in Australia to any one of a number of Aggregating Virtual Circuits (AGVCs).

The AGVC is basically a standard ATM PVC based leased circuit (in effect) between the Telstra aggregation-point at an exchange/s in each state, to the ISP or service provider point of presence in the same state. The Government needs to look at migrating away from ATM-based AGVC services to Gig-E based AGVC services, in line with MEF standards and NGNs.

With regard to the locations at which POIs should be sited to enable secure and ready access by access seekers, TransACT believes that physical locations need to be available adjacent to or within, Telstra exchanges or where current AGVCs are located. TransACT understands that AGVC POIs are currently available in each of the existing 66 Call Collection Areas (CCAs) across Australia.

Moving to an NBN environment, it would be preferable to consolidate the number of POIs to a limited number of sites in capital cities and/or major regional centres within each state or territory, providing Gig-E interfaces.

Timeframes and costs

As indicated above, the provision of backhaul links to blackspot locations can be a complex task and would require further detailed design and planning analysis. In many cases, only single backhaul links have been provided due to the difficulty and costs associated with deployment. Some terrains and remote locations don't lend themselves to cost effective deployment of fibre optic networks, resulting in terrestrial microwave, supplemented with satellite technologies, as the default network of choice.

There is a number of highly experienced telecommunications design and construction companies operating in Australia today who have the technical and resource capabilities to deliver on the Governments initiative. It would be expected the proposed Request for Tender (RFT) would include detailed timeframes and costs associated with planning, construction and commissioning of backhaul infrastructure to priority locations as identified by the Government through this consultation process.

Repeater/regenerator equipment

The extent to which optic fibre repeaters/regenerators would be required is very much dependant on the application of the specific link and the bandwidth of the signals being transmitted. The continued development of long-haul optics is significantly reducing the need for repeaters.

Corning⁶ is one of many world leaders in the manufacturing of long-haul optic fibre. Corning® LEAF® optical fibre is the world's most widely deployed non-zero dispersion shifted fibre. Across six continents, Corning has sold over 30 million kilometres of this advanced, high-performance fibre. A backbone by LEAF® fibre provides network capacity and flexibility enabling future growth and compatibility with emerging network technologies. With its moderate dispersion and large effective area, LEAF fibre continues to be the fibre of choice for today's high-data-rate and tomorrow's all-optical long-haul and metropolitan networks. New developments in Dense Wave Division Multiplexing (DWDM) over optic fibre are seeing 10Gbs transmission capabilities over up to 1200 km.

Australian scientists and their fellow engineers at NICTA, Australia's Information and Communications Technology (ICT) Research Centre of Excellence, have invented a new device known as a multi-impairment monitor⁷. It will allow infrastructure providers to confidently increase the speed ratings on long haul optical fibres – from 10 gigabits per second to 40 gigabits per second or more without losing data in the noise in line. And it can identify the distinct visual patterns created by the common forms of noise and distortion in optical fibres.

The six most common sources of impairments are:

- optical amplifier noise;
- too much dispersion as the laser beam travels down the fibre;
- a fibre that's not quite symmetric – leading to more dispersion of the signal;
- power levels that are too high;
- interference from adjacent channels; and
- unwanted reflections.

Trevor Anderson, a principal researcher from NICTA said, "The current tools available in the marketplace only count the errors in the data, telling the operator a problem exists but not what that problem is, where the problem is or what caused it. Our device can already identify the top four sources of noise and we expect to be able to do all six. In the long term we hope it will be small enough and cheap enough to be embedded throughout long haul networks."

Patents have been lodged for the technology in the new device and telecommunications companies are lining up to discuss the potential. He anticipates the device will be ready for market in 12 months.

If repeaters are required for specific optic fibre network architectures then the approach to the location of repeaters needs to be considered during the planning and design phases for priority backhaul network locations. The principles and approach in regard to powering and housing repeater equipment are not dissimilar to those considered in any telecommunications

⁶ http://www.corning.com/opticalfiber/products/LEAF_fiber.aspx

⁷ <http://www.sciencealert.com.au/news/20081807-17672.html>

network design. Routes would need to be considered with respect to terrain, including flood zones, and the location and availability of power.

These issues would need to be included for consideration as part of the proposed Request for Tender (RFT) to be issued by the Government.

Relative merits of alternate routes and ring architectures

As with deploying unviable duplication of backhaul links, serious consideration needs to be given to the provision of alternate or diverse routes to existing backhaul infrastructure.

Provision of alternate links should only be considered where economically viable or where a diverse route is considered necessary in the support of critical infrastructure and/or services.

TransACT understands that the Australian Government has not made any final decisions on the specific design and operational arrangements for this initiative, but considers it important that Core Network Infrastructure, particularly that which could potentially provide access to a POI on the proposed NBN, should provide alternate or diverse routes wherever technically and economically viable.

TransACT considers that ring architectures in regional backhaul networks can often be uneconomical to deploy, similar to alternate or diverse routes. As with alternate routes, the relative merits of ring architectures should only be considered where economically viable or where it is considered necessary to support the operation of critical infrastructure and/or services. Many networks in Australia today operate on spurs due to the economics of deploying alternate, diverse or ring architectures.

Operational and ownership arrangements

Proposed Model

There are a number of models that the Government could consider in relation to ownership arrangements and commercial viability of designing, constructing and commissioning regional backhaul to blackspot areas.

TransACT recommends that to expedite the process, that funding is arranged through the Department and once the implementation study has been completed, the transfer of access and/or ownership should be aligned with the recommendations of the study.

It is important for the Government to seek any potential partnership arrangements regardless of the model/s which are ultimately adopted.

The Government will also need to actively engage with state, territory and local governments for partnership arrangements. Many state and territory governments, and municipal councils, have already developed policies and planned for investment in telecommunications infrastructure. The Victorian Government recently announced that it had earmarked \$20 million for building new fibre optic links to rural areas without competitive network infrastructure. Commitments and investments of this type which should be leveraged with Australian

Governments initiatives. The Australian Government needs to continually consult and work with the industry and related bodies to ensure that we can quickly address backhaul blackspot areas and transition towards the successful implementation and completion of the National Broadband Network.

Attachment 1: Priority Locations

