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I researched broadband diffusion in the Northern Rivers region of NSW from 2002- 2005. During that time I surveyed residents and interviewed organisations about their use of telecommunications, particularly broadband. Most data collection occurred prior to the Higher Bandwidth Incentive Scheme (HiBIS) being introduced in late 2004, however a number of my findings have relevance to the questions being posed by the Department of Communications IT and the Arts (DCITA) in this Discussion Paper.

3. BROADBAND CONNECT

Q1 How can the design and delivery of Broadband Connect be optimised to achieve long term sustainable quality broadband solutions for regional, rural and remote Australians?

Q2 What means can/should be used to encourage further capital investment in infrastructure that will support competitive networks and services under Broadband Connect and beyond?

Q3 How can Broadband Connect funding be structured to provide the best incentives for investment?

Most of the areas in the Northern Rivers site investigated in my research were reliant on ADSL and satellite technologies for broadband connectivity. There were a few areas that had access to wireless services. Satellite services were not seen to be competitive to terrestrial broadband services in either price or performance, although higher capacity satellites have come into operation since the research was carried out. ADSL services were reliant on telephone exchanges being upgraded by Telstra (installing DSLAM's), and Telstra used a public demand register to prioritise upgrading. Although this greatly improved the timeframe for the delivery of competitive ADSL in the Northern Rivers region, it also created a second tier of "trickle down" access to ADSL services, which many independent business people who lived in the smaller population centres, but who had high data needs (e.g. people who serviced North American database companies or film-makers) complained bitterly about. In addition many people thought that ADSL was not comparable in performance to cable broadband available in metropolitan areas, and used by industry groups overseas.

Local ISPs in the Northern Rivers study site complained that Telstra's wholesale prices for broadband connectivity did not include enough margin for them to run a sustainable business. Some ISPs stated that the growing popularity and ubiquity of broadband services and the steady migration of their client base from dial-up to broadband would eventually send them out of business. In addition local ISPs claimed that the intelligence Telstra gained from wholesaling bandwidth to its competitors meant that it was able to form marketing and other strategies to increase the market share of Telstra Bigpond. Telstra's ability to bundle content with connectivity was also threatening to local ISPs.

Some people consulted in my research stated that the supply of content by Telstra through its Foxtel network, along with inflated revenue from telephony, meant that Telstra's interests lay in retarding or stifling the use of other digital applications on its network – such as Voice over IP (VoIP) and cheaper forms of videoconferencing and video transfer technologies. Any restriction on the use of these applications was thought to lessen the economic benefits of broadband for many people in rural and remote areas.

It was clear from my research that there was a lack of trust in the existing operational separation within Telstra, and a scepticism that it will ever be achieved. A number of people suggested that specific strategies need to be employed to ensure that there is effective competition in infrastructure capable of delivering broadband services (i.e. far less reliance on Telstra's ADSL and satellite services). This may include measures currently being implemented as well as encouraging companies other than Telstra and, in particular, encouraging the development of more wireless ISPs (WISPs).

Spectrum access and the rapid privatisation of the radio frequency spectrum over the last six years has been an issue in the development of wireless services, including wireless services in the Northern Rivers. It is therefore encouraging to see more spectrum being made available by the Australian Media and Communications Authority (AMCA) specifically for regional and rural broadband services. Policies are not "technology neutral" if resources (such as spectrum and high points) vital to the delivery of wireless forms of broadband services are not available for utilisation.

Some people interviewed suggested that greater access to cheaper spectrum and apparatus licences to enable the deployment of wireless services along with the subsidisation of wireless infrastructure by applicants other than Telstra would benefit many areas. Assistance to negotiate backhaul and possibly transmitter site access would also benefit some areas.

It is also my opinion that Broadband Connect would meet its specific aims of producing more effective and sustainable competition in broadband services in regional and rural areas if it acknowledged Telstra's dominance of the current broadband market through its ownership of the copper-wire network, and structured its funding towards the development of competing terrestrial infrastructure – specifically newer wireless technologies and fibre-optic cable owned by other commercial entities.

Policies that don't consider either a) Telstra's incumbency and dominance or b) the expense of satellite services only reinforce Telstra as the dominant provider in non-metropolitan areas, create the risk that Telstra will be able to form effective geographic monopolies in infrastructure supply over much of the nation. This may then retard the development of cheaper and more innovative competing terrestrial networks.

In the short term enabling more exchanges to supply ADSL has increased broadband take-up in non-metropolitan areas. In this second stage of funding, perhaps more consideration could be given to funding alternative infrastructure within the exchanges themselves, or as previously mentioned, alternative last-mile technologies such as wireless and fibre-optic cable.

Q4 Is terrestrial or satellite the most appropriate means of delivering broadband in regional, rural and remote areas?

Q5 Can satellite be delivered as competitively as terrestrial services?

Most people who mentioned satellite services in my research held the view that satellite is the “fall-back” position for people out of range of terrestrial networks. Past predictions regarding competitive satellite services have not been fulfilled (e.g. claims surrounding the deployment of IPstar), and satellite services are still viewed to be more expensive and sub-standard to other forms of broadband delivery. However it may be that at sometime in the future bundled entertainment, media and Internet services make satellite services more commercially viable for consumers seeking broadband services. It is my view that policies should be focussed on the deployment of competing terrestrial infrastructure.

Q6 Should participating providers be required to commit formally to service the areas they identify in registration applications?

Q7 Should annual renewal of funding agreements specify timeframes for commencement of services in areas of greatest need?

Q8 Should a system of prioritised funding for services connected in areas of greatest need (beyond what has been provided under the HiBIS two-tiered incentive structure) be introduced?

Q9 What can be done further to overcome barriers to capital investment in sustainable technologies in less commercially viable regional areas?

Q10 How can the high cost of some technologies be reconciled with increasing customer expectations for higher speeds and usage allowances especially in more remote areas?

Q 6-7. Unable to provide comment on these questions.

Q 8-9. It is my view that areas reliant on satellite services, and then, areas without competing terrestrial broadband networks (from at least two suppliers), or areas with poor telephony services should be given priority in funding. When assessing funding applications consideration should be given to promoting a competitive and sustainable telecommunications environment, rather than just increased access *per se*.

Negative network externalities created by a heterogeneous web-speed environment means that it is vital that all parts of the country are given access to the higher data speeds as there is an increase in general use. Not providing increased bandwidth to some areas will retard the performance of the current networks and connections (due to larger files and applications circulating on the Internet) and significantly impede business and economic development in affected areas. Therefore yes, the cost of supply to ensure all areas have a degree of parity in bandwidth access must be met by the Federal Government and reconciled on economic development and equity grounds. If this doesn't occur geography-based economic discrimination will occur. The rapid deployment of terrestrial broadband networks, and where

possible, fibre optic cable, will reduce the overall financial burden of subsidies to satellite and other technologies.

Q11 Should it be mandatory for program participants under Broadband Connect to provide additional information as listed below as a condition of registration?

- intended future service areas (with approximate dates of commencement of supply;
- the viable geographic reach of broadband services from central transmission points for service delivery;
- technical barriers limiting the application of providers' technology in regional communities;
- the capacity of providers' technology to support varying types of broadband traffic and use;
- the range of service speeds providers' technology would be able to support;
- the capacity of providers' technology to provide services now and to accommodate new developments such as increased speed, usage and applications in the future;
- the particular relevance of the technology to other communication services (for example, capacity to be used also for supporting mobile telephony services);
- a summary of the broad nature of technology they employ; and
- anticipated timing and target areas for their technology deployment in regional Australia.

I do not think that future projections are particularly useful - as applicants are not likely to be able to provide accurate information and assessing projections/fulfilment of projections will be burdensome on both the applicant and the Department.

However information on the technical capability of any proposed infrastructure is very useful, especially in areas with low population densities. Useful technical information may include mobile capability, bandwidth/data-speeds, interoperability, level of "open access" and supported applications (e.g. RF overlays to support video applications).

Q12 On what basis would you argue that certain specific technologies will have the most impact on the delivery of regional broadband services in the next three to five years?

Q13 How would you compare the effectiveness of these technologies to others in the market place?

Q14 To what extent will broadband technologies be able to augment capacity to meet rapidly expanding consumer expectations for higher bandwidth and more advanced applications?

Q15 Can complementary technologies provide better solutions for delivery of services in regional Australia?

Q16 What innovative approaches should Broadband Connect adopt in its program design to utilise these technologies most efficiently and effectively?

Q17 What capacity do existing technologies have to accommodate the introduction of new developments, such as increased speeds, usage and other applications?

Q. 12. I would argue that wireless technologies will have the most impact on the delivery of regional broadband services in the next three to five years. This is based on cost of installation, the capacity to offer mobile services, potential bandwidth, reach and interoperability. I would also argue that fibre-optic cable has greater capacity for data service provision in the longer term. Since fibre to the home is likely to become a natural monopoly I feel that DCITA needs to play a much greater role in regulating ownership and access of/to fibre cable networks to ensure ownership is separated in an effective way from legal entities able to supply content and services on the cable.

It is my view that the term "technology neutral" has been quite problematic in implementing various policies in the Australian context. There is currently little recognition that the current interaction of various policies has favoured certain technologies – such as ADSL – over other technologies such as wireless and fibre-optic cable. In many ways the market itself hasn't decided on appropriate technologies, it has merely responded to the gambit of interacting policies being implemented. The Federal government has also been able to control the technologies diffused through its majority ownership, steerage and subsidisation of Telstra.

Acknowledging that policies haven't been technology neutral up to this point then allows DCITA to adopt policies that specifically encourage competition through support for specific alternative infrastructure such as wireless transmitters.

Q 13.

Technology	Reach and Capacity	Potential Developments
<p>ADSL/ xDSL</p> <p>Most common form of broadband delivery in Australia.</p> <p>Benefits: Utilises existing copper telephone wire into the home. Enables competitive broadband services to be delivered by national and local ISPs. Low-set up and installation costs for the customer and transportable equipment (ADSL modems). Low subscription costs.</p> <p>Limitations: Availability of services is dependent on the quality of the telephone wiring into the home. 5-10% of the existing customer access network in Australia is unsuitable for ADSL delivery. Enabling exchanges requires significant investment and exchanges are often only enabled after there is demonstrated demand. The infrastructure is likely to get worse over time. Not likely to ever match the performance of cable networks.</p> <p>Currently regulated to be an "open" network, although Telstra's competitors complain about Telstra's management and operations.</p>	<p>Available to over 75% of the Australian population</p> <p>Reach: Able to be delivered to residents and businesses within 4.5 km from an enabled exchange. Telephone exchanges in most (although not all) villages and suburban centres in Australia, are enabled to supply xDSL services.</p> <p>Bandwidth: Up to 2Mbps each way, although most ADSL packages have a maximum of 1.5Mbps/256kbps speeds.</p>	<p>Improved DSL technology is able to extend services to up to 9km reach from an enabled exchange and achieve data speeds up to 25Mbps (ASDL 2+)</p>

<p>Hybrid Fibre Coaxial Cable (HFC)</p> <p>Second most common form of broadband delivery in Australia Originally installed to supply Pay TV.</p> <p>Benefits: Infrastructure already installed in major metropolitan centres in Australia. Capable of very high data speeds. Good reliability. Can deliver multiple services on the one connection (telephony, data service and broadcast services). Comparable to ADSL service in terms of cost to the customer of installation and subscription.</p> <p>Limitations: The high level of infrastructure investment needed for cable networks makes it uneconomic to install to residents outside high population density areas.</p> <p>Networks are not open for use by other telecommunications providers. Networks currently owned by either Foxtel or Optus.</p>	<p>Reach: Reportedly HFC cables pass 35% of Australian homes, but are restricted to capital cities and major metropolitan centres.</p> <p>Bandwidth: Potential for very high data speeds – currently unlisted by the major providers but operate at speeds greater than 2Mbps</p>	<p>New cabling in Australia likely to be fibre-optic cable, not HFC, although improvements in the data delivery on HFC cable network likely to increase speeds and functionality of existing connections.</p>
<p>Fibre Optic Cable (Deep Fibre Networks)</p> <p>Benefits: Capable of very high data speeds, and almost infinite future capacity. Good reliability. Can deliver multiple services on the one connection (telephony, data service and broadcast services). Comparable to ADSL services in terms of cost to the customer of installation and subscription.</p> <p>Limitations: The high cost running cable pass homes makes it uneconomic for telcos to install fibre cable to residents outside suburban or township areas.</p> <p>Networks allow services to be delivered via competitive ISPs or content providers, however infrastructure owners do not allow a completely open network.</p> <p>Due to the high bandwidth and expense of laying the fibre, is likely to become a natural monopoly.</p>	<p>Reach: Restricted to some metropolitan areas (including Canberra, and certain regional centres).</p> <p>Bandwidth: 52Mbps and running simultaneous Internet, telephony, broadband and Video-on-demand services.</p>	<p>Potential for almost unlimited data transfer rates.</p> <p>The most stable long-term infrastructure.</p>
<p>Satellite (one or two way)</p> <p>Benefits: Reliability in times when terrestrial communication systems fail (e.g. during natural disasters), and coverage levels.</p> <p>Limitations: Most expensive form of broadband due to the high launch costs of satellites, the high cost of the receiving and transmitting equipment and the limited capacity of existing satellites. This results in high installation and subscription fees for the customer. Seen as the service of last resort.</p> <p>Issues related to reliability and latency (due to weather and cloud between the land and the satellite) may limit its use for some real-time applications such as multiplayer gaming, online auctions and voice and data</p>	<p>Reach: Complete coverage of the Australian continent and surrounding territories.</p> <p>Bandwidth: Highest speeds provided by Telstra are 800/128kbps – downstream/upstream – limiting its use for uploading content or data-rich material.</p>	<p>Number of launches of high capacity IP satellites over the last 3 years has promised to provide competition in the broadband satellite market, but this has not yet eventuated (December 2005).</p> <p>This new satellite [iPSTAR 1] is the third next-generation satellite providing services to Australians after the recent launch of the Optus C1 satellite and the launch of the New Skies Satellite's NSS-6 – a satellite array which will provide an unprecedented level of competition. (Department of Communications Information Technology and the Arts, 2003b: 7)</p>

<p>services.</p> <p>Currently residential satellite broadband connections only provided by Telstra and Optus, although other satellites have been launched to provide residential services.</p>		
<p>Wireless Networks – WiFi, 3G, LAN, WAN, MMDS</p> <p>Often seen to offer the most potential to connect rural and remote areas unable to access broadband services via 'wired-in' technologies.</p> <p>Benefits: Transmitting equipment cheap and reliable. Provides a cost-effective 'last mile' solution to low-density population areas. May operate on licenced or unlicenced spectrum. Relatively low start-up costs allow for community-owned wireless telecommunications companies as well as smaller commercial telecos to enter the market, promoting competition in areas that larger telecos may view as uneconomic.</p> <p>In some cases may also offer mobility and include global positioning systems (GPS).</p> <p>Limitations: 3G networks currently restricted to metropolitan areas. CDMA 1xRTT increasingly available in regional areas. Many wireless technologies currently limited to 'line-of-sight' transmissions due to the high frequency spectrum used for broadband delivery. Carrier licences a disincentive to offer commercial wireless services.</p>	<p>3G mobile networks available in capital cities and limited areas beyond capital cities, WAN and MMDS now establishing in metropolitan and non-metropolitan areas.</p> <p>Reach and bandwidth dependent on the type of transmitter and spectrum used :</p> <p>WANS & MMDS Reach: dependent on the terrain. Approx. 15-40kms from the base station. Bandwidth: Variable. Typically up to 2Mbps.</p> <p>3G Mobile (CDMA2000) Reach: dependent on the terrain (roughly line-of-sight) 3-4km from base station. Bandwidth: approx 1Mbps</p> <p>CDMA 1xRTT mobile wireless Reach: dependent on the terrain up to 25km from the base station Bandwidth: 144kbps.</p> <p>LMDS Reach: up to 5km from the base station Bandwidth: variable</p> <p>WLAN - (WiFi or 'hot-spots' – 802.11b) Reach: up to 20metres from the transmitter Bandwidth: variable – typically up to 4 Mbps</p> <p>Bluetooth, ZigBee, Ultrawideband Reach: 4m meters from the transmitter</p>	<p>WiMax (Wide area WiFi – 802.16)– reach 50km from the base station with bandwidth in excess of 10Mbps WiMax is a new WiFi technology largely untested and currently unavailable in Australia (Arnason, 2004), although groups such as Big Air have plans to deploy WiMax in Sydney (P. Choi, 2004).</p> <p>Current trials with low frequency spectrum bands (vacant spectrum in bands spectrum used by TV channels) may offer non-line-of sight transmission up to 100km from the base station (similar to TV footprints) with data speeds greater than 100kbps.</p> <p>New wireless technology 'smart mobile data devices' are making better use of existing spectrum and allowing higher traffic rates and less interference between a greater number of devices. This may reduce some of the limitations on spectrum utilisation related to interference.</p>
<p>Broadband Via the Electricity Grid (Powerline Broadband or PLB)</p> <p>Benefits: Powerlines in place in almost all homes in Australia. May offer infrastructure competition to telephone cables and ADSL technologies without the cost of installation. Could reduce the benefits from Telstra's incumbency. Could provide bundling advantages: electricity, ISP and data bills all on one bill. Power companies could read power meters remotely.</p> <p>Limitations: Data transmission may be affected by power surges and electrical activity on the lines. Exposure of the powerlines to the weather affects data transfer.</p>	<p>Only trials of broadband powerline systems currently in Australia</p> <p>Reach affected by the quality of the lines and power supply. Quality of data transfer decreases over distance, so possibly only really effective in metropolitan areas. Despite initial hopes, current trials do not support PLB as an alternative last mile technology in the provision of broadband in non-metropolitan areas.</p>	

Q. 14 – I'm not sure what is meant by this question however Voice over IP (VoIP) will be able to replace traditional phone calls in many cases (assuming that charging regimes don't become controlled only by the infrastructure owners), Video on demand will augment and perhaps replace the need for video hire stores, IPTV and digital TV will be able to replace

traditional broadcast services. The capacity of newer broadband infrastructure to augment existing capacity will depend on the infrastructure installed.

Q. 15. – 17. I am unsure as to what “complementary” technologies would replace or supplement broadband services should they be unavailable. As described in the table above – ADSL can be upgraded to ADSL 2+, radio frequency spectrum could be better utilised to supplement more wireless services etc...

- Q18 Should the current system of incentive payments to providers for the supply of broadband services be retained?
- Q19 Would an up front method of payment be more effective?
- Q20 How else could the method of payments to providers be adjusted to achieve more satisfactory outcomes for providers and people living in regional, rural and remote Australia?
- Q21 Should funding be provided:
- based on the number of customers connected?
 - the number potential premises with potential access?
 - a combination of both methods?
- Q22 If funding was based on the number of premises with potential access should it then only be provided for infrastructure?

I am not a provider, and have not interviewed many providers since the introduction of HiBIS however, it is my view that incentive payments for the supply of broadband should be retained, that upfront payments are not necessary and could possibly promote poorer service provision, and that incentives to increase the capital investment in infrastructure by providers would be beneficial to increasing terrestrial broadband infrastructure and competition in Australia. Perhaps there could be greater incentives for the construction of infrastructure that provides “open access”.

Q23 How can methods of payment under Broadband Connect be better structured to ensure that providers are not overcompensated for the supply of broadband services?

I have no experience in this area and am unaware of how “over compensation” currently occurs (perhaps through the “technology neutral” policies that don’t recognise the additional cost of some forms of service provision) however there have been anecdotal reports that Telstra has been the primary recipient of the HiBIS scheme. This perhaps may be curtailed through even more stringent access conditions on the use of funds by Telstra, and by being proactive about investing in competing technologies in areas where there is only one form of broadband provision.

Q24 Should the current HiBIS threshold model for speed and usage be maintained at existing levels under Broadband Connect?

Q25 Should the model be retained with increased minimum speed and/or usage requirements?

Q26 Should two separate minimum speeds with two subsidy levels be introduced?

Q27 Do threshold requirements need to be expanded to accommodate other issues such as latency?

Q. 24 – No. As consumers in metropolitan areas upgrade to 1.5Mbps and above it will be imperative that people living in regional and rural Australia are also given access to the higher bandwidths at comparable prices. It is important that the current model is upgraded to reflect increasing data needs across the entire Australia network.

Q25 – 27. There should be a sliding scale of speeds and prices equivalent to metropolitan services, and they should reflect latency and also up-load speeds.

Q28 Should the Broadband Connect Stage 1 price caps be retained under Stage 2?

Q29 Should a greater range of price caps be introduced than the two currently available?

Q30 Should the current funding cap level of 60 per cent continue under Broadband Connect?

Q 28. Yes – price caps should be retained, but updated.

Q. 29 – Yes – see above

Q. 30. Unable to comment.

4 CLEVER NETWORKS

Q1 Considering the current DAB program structure - involving State, community and sectoral brokers - is the current arrangement the best model for catalysing broadband developments in regional, rural and remote Australia or how should it evolve?

This is the only question I will contribute to in this section because I believe that there are a number of issues related to the current Demand Aggregation Broker scheme, and regional support for broadband initiatives and co-ordination in general, and these issues could be addressed through broad legislative reform in several areas. Rather than answering specific questions about a scheme that I believe is in need of broad reform I will offer an alternative that the Department may like to consider. It is my belief that in the wake of the full-privatisation of Telstra, the Government's (and thus the Department's) aim should be to give more ownership, responsibility and fiscal capacity to local government areas so that they are able to deliver services to their own citizens, organisations and businesses.

The primary concern I have with the current Federal Government schemes to promote broadband connectivity, with the exception of HiBIS, is that they are so ad-hoc and, in many cases, finite. They rely on local government areas and other not-for-profit organisations to

identify needs and apply for funds – which are approved at the discretion of the Federal Minister. Local government is the only tier of government that does not generate any economic gain from the promotion of economic development within its jurisdiction. Unlike the States or the Federal Government, whose income in tax receipts increases with community prosperity, the income of local government is fixed based on rates and grants from the Commonwealth Grants Commission. Local government is also the tier of government most affected by the significant cost shifting that has accompanied the sale of public utilities and the implementation of National Competition Policy (NCP).

Local governments are being asked to be responsible for the effects of globalisation, without being given any extra fiscal capacity to meet those responsibilities. This has promoted the hegemonic authority of the Federal Government (which can be politically abused), and a “begging bowl” culture from within the regions. Schemes that ask for dollar-for-dollar contributions also discriminate against the worst affected areas, or those with the least fiscal capacity to adjust to change.

Local solutions to local problems

The diversity and complexity of networked data delivery technologies means there will be many options available for those seeking the most efficient delivery mechanism. It is my belief that local governments and their constituency are often in the best position to find and implement local solutions. This includes integrating broadband access plans into building codes and providing development and planning assistance. Local government are able to work with State and Commonwealth bodies to enable the delivery of health, education and emergency services. These sectors however should also receive additional funding through specific nation-wide schemes.

It should also be noted that the Universal Service Obligation (USO) that protects voice-only services and public telephones, is increasingly redundant and going to become an on-going issue for Telstra and its shareholders, as well as the rest of the telecommunications industry who are currently subsidising Telstra for the provision of these basic services.

Over the next decade economic growth and prosperity will be closely linked to effective telecommunications infrastructure. Therefore it is vital that effective and ongoing solutions are found to fund the sustained development of regional telecommunications. Instead of a very discretionary demand brokerage scheme and other ad-hoc support what is needed is a dependable and formula driven subsidiary scheme. My proposal is that broader legislative reform is implemented so that the USO imposed on Telstra is replaced by a Community Service Obligation (CSO) imposed on Local Government Areas (LGA's). Instead of the telecommunications industry subsidising Telstra for the cost of service in regional and rural Australia, a reasonable levy could be extracted from the telecommunications industry through licences and given to LGAs to fund their own broadband co-ordination officers as well as Community Technology Centres (CTCs) – possibly integrated with local libraries and community media; and organisations, and public access points (public phone/email/internet access). The Federal Government could promote national broadband benchmarks.

The formula to fund local broadband co-ordination could be based on factors such as a) population, b) topography, c) area serviced, and d) existing and competing infrastructure.

A national network of local government telecommunications brokers could further advise on the facilitation of Federal schemes such as HiBIS and CCIF.

This kind of structure not only empowers local areas in their own broadband initiatives and enables the formation of local partnerships with telecommunications providers, but establishes a governance architecture able to assess and deploy technologies that will deliver higher bandwidth services in regional areas over the next five to fifteen years.

Under the Australian Constitution telecommunications is a responsibility of the Commonwealth Government:

69. On a date or dates to be proclaimed by the Governor-General after the establishment of the Commonwealth the following departments of the public service in each State shall become transferred to the Commonwealth:--

Posts, telegraphs, and telephones:
(Chapter II. Executive Government)

I am not a constitutional lawyer however it is my understanding that Community Service Obligations (CSOs) regarding the supply of digital data services could be co-ordinated, administered and funded by the Commonwealth through local government bodies. It should also be noted that convergence is challenging existing definitions of telecommunications as defined and written into the Constitution.

I hope this submission has been useful to your work, thank DCITA for the opportunity to contribute and wish the Department all the best in formulating effective policy and subsidisation schemes that support a very fast-evolving telecommunications environment.

Alicia (Lucy) Cameron