

Submission to the
**Standing Committee on Broadband in
Rural and Regional Communities**

on

**Broadband in Rural and Regional
Services**

By

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February 2010

Innovative Synergies

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Dear Vicki

Thank you for the opportunity to submit a response to your Standing Committee on Broadband in Rural and Regional Communities.

In this submission I have provided a brief engineering history to explain:

- Where and why the Analogue Backhaul telecommunications infrastructure existed,
- Why this Analogue network ran in almost total chronic congestion.
- Why the Davidson Inquiry literally isolated the non-Metropolitan areas as backwaters,
- How the Digital Backhaul telecommunications network surpassed expectations,
- Why Optical Fibre is so cost effective,
- Why Pair Copper is a very poor Broadband Bearer,
- Why Optical Fibre will be the CAN Bearer of choice everywhere,
- How and where the NBN Backhaul network can be augmented into NSW,
- Why AARNet should be merged into the NBN,

This brief background history provides the lead-in scenario sets the scene to provide meaningful answers to the three questions of your Inquiry.

- How the NSW Government can make big ICT business west of the Great Divide,
- How to teach seniors to capitalise on computing technologies,
- The imperative to think Nationally and not State-based,
- The Imperative to use an established Person Coding System providing Unique identification,
- The necessity to one Nationally Common Personal Coding System for all databases including those used for Education, Police, Social Services, Department Of Community Services, all Hospitals, Medical Centres, Residences, Land Phones, Mobile Phones and Emails,
- The imperative to groom and cleanse data relating to: Educational, Police, Social Services, Medical & Hospital, Phones, Residences, Businesses, Community Services, Councils etc in Regional centres (Office of Data Integrity) west of the Dividing Range,
- The opportunity to Locate main International Websites inland of the Great Divide, as mirrored Websites in very safe geographic environments
- The economic opportunity to locate a considerably higher proportion of the NSW Government bodies in regional cities west of the Dividing Range,

- The opportunity to build Video Animation processing studios in Regional centres west of the Great Dividing Range,
- The opportunity to change the structure of Cattle and Sheep sales, through a NSW Govt. Broadband Internet Website to foster the businesses of farming and grazing.

This list is not exhaustive and it shows that a large portion of the metropolitan population can be decentralised in a rather short time, but the prime stoppers are very poor Internet capability west of the Great Dividing Range, coupled with a very thin rail infrastructure west of Penrith, south of Campbelltown and north of Chatswood; and poor road infrastructure West of Katoomba, and west of Windsor/Richmond.

In my opinion, considering that oil will be running out within 15 years, road transport will converge onto rail and this rail infrastructure must be duplicated so that relatively fast services (120 – 220 km/h) can operate to at least Orange, Dubbo, Tamworth, Canberra, Newcastle, Wollongong, Goulburn, Griffith, Wagga Wagga, Narrandera etc within the next decade. It is these corridors that (like Queensland Rail has with their coal export industry) will be the routes for high capacity Optical Fibre, and these rail routes will replace major haulage on roads in the future.

It was very interesting to note that in the Broadband blog Website www.whirlpool.com.au that in Melbourne in particular, people actually moved out of suburbs because they could not get Broadband Internet. Take this initiative a little further and it is very obvious that almost nobody with an ICT business would even consider setting up business or living in an area if the Broadband connectivity to the region that is anything less than that of a typically well-connected metropolitan area like suburban Sydney (with Cable Internet).

The imperative is that all regional cities and rural area must have very strong Backhaul backbones connecting to them and that fibre to the premises (FTTP) has to replace pair copper as an absolute emergency – before business can flourish beyond Sydney. And as Telstra has its commercial hands tied, this non-metropolitan infrastructure rebuild is in the hands of the NBN Co.

Time is critical for the NSW Government to be pressing the NBN to get very active in NSW.

Please do not hesitate to contact me for further information.

(Signed)

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Inquiry Terms of Reference

This inquiry was self-referred.

The Standing Committee on Broadband in Rural and Regional Services will inquire and report into the benefits and opportunities for rural and regional communities of having access to telecommunications (including broadband) and other technology services with a particular focus on:

- (a) improving government services and efficiency in service delivery, including in the areas of education, health and justice services
- (b) improving the level of engagement of rural and regional communities in public life through new technologies
- (c) investigating the potential economic benefits from new technology on commercial and business opportunities in rural and regional communities.

Personal Background

Virtually all my working career has involved with providing, maintaining and delivering exceptional telecomms service Quality standards in Australia since 1966, and because I was brought up in central NSW much of my focus was and still is in providing telecommunications services in regional and rural Australia that would match those in the capital cities (which in *telecomese* are known as the 'metropolitan' areas).

In this time-span, I have worked within the PMG's Department, Telecom Australia, Telstra, Nortel Networks, Australian Seniors Computer Clubs Association, Silcar Communications, Market Clarity and other businesses in a number of roles including: Technician, Senior Technician, Technical Officer, Senior Technical Officer, Engineer, Senior Engineer, Supervising Engineer, Principal Engineer, Manager, Project Manager, Bid Manager, Business Development Manager, Administrator, Project Engineer, Project Supervisor and Consultant.

In these roles I have worked with virtually every type of telecommunications equipment and infrastructure used in Australia and New Zealand in the last 50 years; and worked with several very different staff structures through all ranks from Internal and External Field staff, Office-based staff at all levels and roles through to and including Senior Executives in multinational corporations, national and state-based companies, government bodies and non-government organisations covering both the private and public sector.

A large amount of my career involved the resolution of the most intractable customer affecting issues and/or the development of new equipment, tests and Quality procedures to ensure that the equipment infrastructure Service Quality standards exceed customer expectations.

Backhaul Infrastructure

The Analogue Backhaul Network

Since the days of long distance analogue transmission, NSW has a switched transmission backhaul infrastructure that is 'Sydney centric'; that is, (almost) all transmission systems have what were called "Sydney End Terminations" where one end of almost all transmission systems was terminated in Sydney.

The other part of the earlier backhaul consisted of high capacity systems between the capital cities, so in NSW there is a very high capacity link to Melbourne via Canberra, Wagga, Albury; another high capacity link to Brisbane via Newcastle, Port Macquarie, Lismore; and a Western Cable to Adelaide/Perth via Penrith, Bathurst, Temora, Griffith, Mildura; then a later system from (Sydney), Penrith, Bathurst, Orange, Dubbo, Cobar, Broken Hill etc.

Beyond these major routes there was virtually nothing apart from little star backhaul networks from the major regional centres that picked up the outlying towns, so it does not take too much imagination to realise that these analogue backhaul networks operated at near to full capacity. What is not so obvious was that the Quality service standards of this backhaul infrastructure was comparably poor in relation to the digital backhaul that started to come into place from about 1981.

What also had to be recognised was that in this period (1966-1986), most of the executive management were effectively children of the depression and had served in WW2, and from that there was a very strong camaraderie to ensure that everybody was employed – no matter how menial the work was. This work practice had many overtones that would be seen as 'highly inefficient' by business standards, but in economic language this was 'highly efficient' as employment (particularly of the older generation) was very high.

It stunned me to find that (1984) even though the NSW country network was operating in congestion; the common practice was to augment the backhaul infrastructure with the least possible equipment to keep the network just off chronic congestion (which meant that in six months that same network part would be in chronic congestions again). Sure, this practice kept many people employed putting in one and two circuits (channels) annually in hundreds of locations, but digital paths came in blocks of 30 channels at a time, and it was seen as immense waste of resources as in some instances several digital channels in a block of 30 would be seen as 'unused' and that caused a tremendous degree of angst in management because the network no longer ran in chronic congestion with not all available equipment being used to its maximum capacity!

In technical terms, this analogue backhaul equipment was state of the art for its time (from the early 1900s through until about 1982), and Australia is considerably larger than Western Europe, where Western Europe was considered to be the engineering lead house. In reality Western Europe engineering had not mastered the engineering intricacies involved with automatic gain control to keep the voice channel levels highly consistent through the changing temperatures of the seasons, and their engineering was based around keeping equipment warm not cooling it as is required far more-so in Australia.

In 1982 the Davidson Inquiry [1] introduced competition into the telecommunications industry (with the prime purpose to get the telecommunications sector onto the ASX so that financial institutions could increase their spread of portfolios and the far more secretive purpose via the WTO that USA corporations could progressively buy out the telecomms

infrastructure and later all government infrastructures in a global basis). With this sudden change in philosophy and the fact that the telecomms backhaul switches were starting to be progressively replaced by digital switches (a process that took in the order of a decade to complete simply because of the size of the overall project), many of the depression and WW2 executive management moved on and were replaced by executives that looked at the financial bottom line far closer than most of those before them.

The Digital Backhaul Network

In 1985 single mode optical fibre (SMOF) became a reality, and with first generation digital systems now being able to interface with SMOF, the telecomms backhaul network in NSW and Australia radically changed. SMOF is dramatically cheaper than coaxial cable or twisted pair, and the first Melbourne-Sydney high capacity link (running 15 pairs of fibres with all associated digital transmission equipment, batteries, etc) cost about \$45 M, or about \$50,000 per km. Compare this to the analogue coax system, which cost at least \$528,000 per km (by my estimations from the coax system costing about 80 Pounds per 'lineal foot' and very high maintenance costs), which the digital SMOF replaced in 1987; and even then the digital SMOF had some spare capacity at the time.

The technology savings of about 90% made it a no-brainer to replace all coax and radio systems wherever possible with SMOF, and this happened in the period 1987 through to 1997, and by that time the second generation of digital systems using Digital Synchronous Hierarchy (SDH) was introduced having bandwidth capabilities that far exceed that of the first generation Plesiochronous Digital Hierarchy (PDH), and SDH was far more reliable.

From about 1990 a second-generation digital backhaul switch technology became available and this switch added another degree of network reliability but it did not solve the major problem for all Australian States, and that problem is still that the telecomms networks are capital city centric. Since the Davidson Inquiry made management look at the bottom line of competition much more seriously, Service Quality in areas that were not highly profitable (ie anything that is not metropolitan) would have an absolute minimum of network funding; and that is why Australia now has a national backhaul telecomms network that really only supports the capital cities and basically nothing else. ***This is the prime reason why NSW Regional, Rural and Remote areas have virtually no Backhaul network of any consequence.***

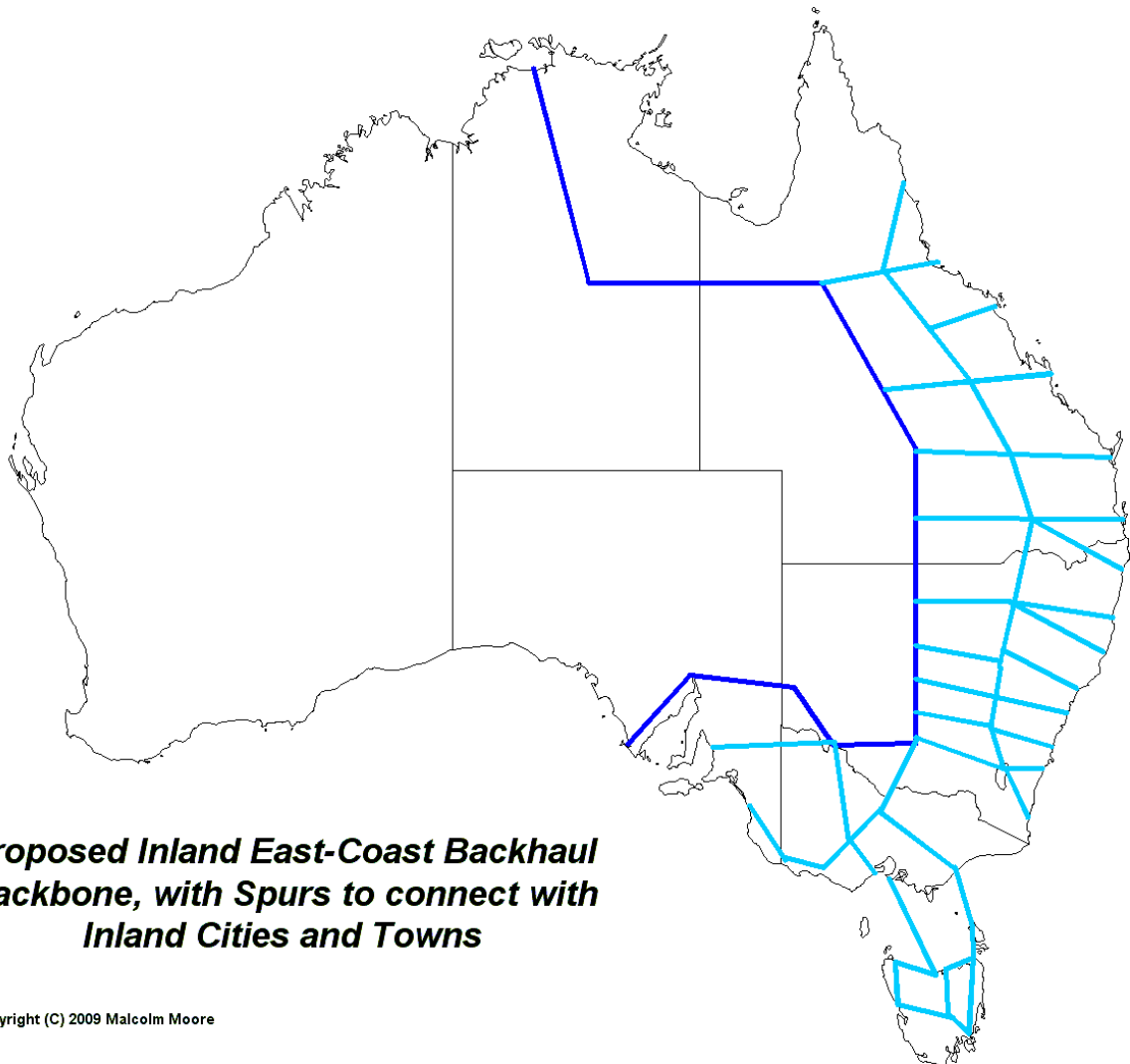
Fixing the Eastern Inland Backhaul Infrastructure

Both NSW and Queensland both have a pitiful backhaul infrastructure, and it is worth noting that before Charles Todd project managed the Adelaide to Darwin telegraph link (so that business people in London could capitalise and profiteer on data about Australian crops / mining); Queensland also put in a bid to install and commission a telegraph link from Brisbane to Darwin but that was rejected.

The submission that I put to the Expert Committee for the NBN in 2008 [2] deliberately included the outline of an internal eastern inland high capacity backhaul link with spurs towards the coast, as opposed the until now largely commercial approach to build out from the largest capital cities to maximise the return on investment (ROI) and minimise the infrastructure.

By building the telecomms infrastructure in an inside-out (outback to coast) approach as opposed to the existing outside-in (coastal to outback) approach, this puts the backhaul backbone on the shortest route between several capital cities, and the spurs connect to Darwin, Brisbane, Sydney, Melbourne and Adelaide; and provides the connective high capacity Backhaul Backbone infrastructure that has totally evaded the remote, rural and

regional areas of NSW. To clarify the meaning of this outback to coast innovation, the indicative map below shows the proposed high capacity backhaul in royal blue and the spurs to the coast in cyan (light blue).



Proposed Inland East-Coast Backhaul Backbone, with Spurs to connect with Inland Cities and Towns

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The NBN project has already committed to build the Darwin – Brisbane link most probably passing through Darwin, Katherine, Tennant Creek, Mt Isa, Cloncurry, Winton, Longreach, Barcaldine, Blackall, Charleville, Dalby, Toowoomba, and Brisbane. This high capacity link literally retraces the Queensland overland telegraph that was proposed before 1862.

If the NSW Government were to realise the potential of this high capacity infrastructure (and realise that Darwin will be the next big city in Australia, and be the major international link to the Asian + land mass) then the NSW Government should be vying for the NBN engineers to extend the high capacity link from Charleville south through ***Cunnamulla, Bourke, Cobar, Lake Cargelligo, Hillston, Griffith, Hay, Balranald, Mildura, Broken Hill, Peterborough*** and Port Augusta.

This high capacity inland link will act as the “inland resource” for industry west of the Great Dividing Range and it has been proven that wherever the high capacity telecommunications bearer travels the towns in this channel prosper much better than anywhere elsewhere.

From my recent employment experience with Silcar Communications and Market Clarity; I know that the telecomms infrastructure beyond Sydney / Newcastle / Wollongong / Penrith /

Canberra is basically shoestring structured and this proposed backhaul will provide the balance that NSW needs so that high capacity backhaul links can be built back to the coastal cities. There are two very big ROI items that will be realised:

- 1 As this inland infrastructure is used for backhaul purposes it will pay for itself in a much shorter time than expected (but never be commercially viable) and,
- 2 Because the backhaul will pay for itself the on-costs to provide local connection to regional, district and local exchanges will be considerably mitigated.

Broadband Backhaul Demands

What has not been discussed is that Broadband Backhaul demands far exceed that for telephony and this is major sticking point. With telephony, the nominal voice frequency (VF) bandwidth is 4 kHz, and nominally 30 VF channels (plus a common signalling channel and a synchronising channel) fit into a 2 Mb/s digital stream.

Consider that nominally 8 to 13 channels are required for each 100 customers (depending on their use demography), then a typical town with a population of say 2500 people would have about 1000 premises, (80 channels) and about 200 businesses with say 800 phones, (130 channels) so the total land line telephony channel bandwidth requirement is about 210 channels which is about seven 2 Mb/s streams (14 Mb/s) back to a parent district exchange. In today's language an STM-1 (155 Mb/s) would be the nominal connection, so there could be plenty of room (49 spare 2 Mb/s streams) for growth.

Consider that every non-commercial premises have ADSL at say 20 Mb/s and the occupancy was say 0.05 erlang, so the total non-commercial Broadband demand for 1000 premises would be 1,000 Mb/s. The 200 commercial businesses have say 3 computers on the Internet each and require an occupancy figure of say 0.08 erlang at say 20 Mb/s, so this Backhaul need is 960 Mb/s. If we included Mobile Phones, (say $2500 * 0.1 E * 4 \text{ Mb/s} = 1,000 \text{ Mb/s}$) Mobile Internet, (say $500 * 0.1 E * 20 \text{ Mb/s} = 1,000 \text{ Mb/s}$). So the total Broadband backhaul bandwidth requirements back to the parent district exchange site is in the order of 3,960 Mb/s for ADSL, Mobile Phones and Mobile Internet, where before with merely telephony the backhaul requirement was in the order of 14 Mb/s (or about 0.35% of the Broadband backhaul network requirement; and we have not even considered Cable TV (which would be provided in a separate optical fibre pair in the same cable from the parent exchange).

In simple terms the Backhaul requirements for ADSL Broadband could be in the order of 4 Gb/s for the 2500 town population alone, or 26 STM-1's (155 Mb/s digital streams). When we include the telephony requirement of 14 Mb/s, then this fits in like an afterthought. Considering that most towns share part of an STM-1, then it is not at all surprising that Broadband outside the metro regions just isn't happening!

Over the past decades it has been interesting watching the bandwidth growth in ***basic network capacity units*** that were provided: in the 1960s as VF channels (nominally 4 kHz), in the 1970s as Groups (12 * 4 kHz channels = 60 kHz), in the 1980s as SuperGroups (5 * SuperGroup = 240 kHz), in the 1990s as Megalinks (2.048 Mb/s digital PDH streams) in the 2000s as STM-1 (155 Mb/s digital SDH streams), and in the 2010s as 1 Gb/s digital IP streams, which will be replaced by 10 Gb/s digital IP streams in the 2020s.

The other consideration is that the CAN cannot transfer these data speeds to and from the customer's premises if the Backhaul is not capable of transporting between the switching centres to the CANs at both ends of the Backhaul network infrastructure!

Australian Customer Access Network

The fundamental problem with the Australian Customer Access Network (CAN) – the network that connects from the local exchanges to the customer / business premises – is that this CAN is basically pair copper cable that was a poor compromise for voice band telephony and a very poor bearer medium for Broadband communications.

Before the 1950s, virtually all the CAN consisted of overhead aerial wires that were spaced about 300 mm apart and resulted in a resistive impedance of about 600 ohms. This technology had a range of about 22 km and the backhaul equipment was engineered to match into this overhead wire transmission system.

After the 1940s because the overhead street wiring was becoming congested, a new technology of underground cables for customer use as the CAN became popular and overhead wiring was rather quickly replaced in the 1950s. The problem was that very few people actually understood impedances in the voice band, and as the telephony systems basically ‘worked’, virtually nothing was actively done to address the immense problem until the early 1990s. The problem is that twisted-pair cable has a ‘complex’ impedance in the voiceband range that basically means that the impedance that is seen into the cable varies with frequency (far, far more than it did with overhead aerial wires).

Because the diameter of the copper pairs in the customer cables was a mere fraction of that used in the overhead wires, the signalling of most twisted pair cables is limited to about 4.1 km in the metro areas and about 7.5 km for thicker country CAN cables (and the voice frequency response is considerably more ‘muffled’ considerably increasing the number of ‘Can’t Hear’ complaints - particularly in non-metro areas.

When it comes to Broadband; using Asynchronous directional transmission data speeds on a Subscribers Line (ADSL); the problems are even more pronounced! Even though the twisted pair cable impedance becomes somewhat stable (150 ohms to 120 ohms) in the frequency range above say 150 kHz, these cables were originally engineered for voiceband (under 3,400 Hz) and consequently their upper frequency attenuation is poor so frequencies used for ADSL (24 kHz – to over 1.2 MHz) are seriously attenuated in a monotonic fashion with increasing frequency (if the standing waves do not interfere).

Most importantly, the crosstalk attenuation is the limiting factor that heavily impacts on performance ADSL speed, limiting the maximum CAN cable length to about 2 km. Beyond this nominal length the energy level of interfering crosstalk from adjacent pairs (particularly using ADSL technologies) raises the “noise floor” sufficiently to cause the error rate in a high proportion of the ADSL modems’ internal battery of receiving demodulators causing these to be disabled, resulting in a very limited data transfer speed capability.

With pair and quad twisted pair cables used in the Backhaul networks before optical fibre, it was standard practice to 5-way capacity balance these pairs and quads to minimise crosstalk and improvements of 30 dB were possible in many cases. That art is now lost and now it is common to use brute force by sending even louder to shout out the others using ADSL2+ concurrently on the same cable.

The remaining options for those further than a town fringe with ADSL in the local exchange is to use point-to-point radio CAN like High Capacity Radio Concentrators or Satellite, else Wideband Code Division Multiple Access (W-CDMA) as used as the media for Broadband Mobile phones / Internet (all which are very expensive compared to Optical Fibre CAN).

The other obvious alternative for pair copper is Optical Fibre and this has a range of at least 60 km, making it an ideal replacement for pair copper. Optical Fibre also has a bandwidth of more than 1,000 Mb/s, where pair copper has a useful bandwidth (at a distance limit of about 2 km) of about 20 Mb/s, and about 1 Mb/s by 4 km (with considerable crosstalk problems).

The Academic and Research Network

Well before the Executive levels in Telecom Australia got wise to Internet, many Universities in Australia were using every available long-haul transmission bearer possible to transmit and receive Internet between the universities. This Academic and Research Network (AARNet) now rivals Telstra's non-metropolitan network in size and that is very telling for the problems caused by the Davidson Inquiry that enforced competition onto Telecom Australia.

The problem is that AARNet sits outside the commercial world and operated as a not-for-profit infrastructure (and does this very well), and although it uses a considerable amount of Telstra's and Optus' network infrastructures (particularly outside the metro areas); it is a very major carrier of Internet traffic between Universities, and internationally it is a very big player by Australian standards. AARNet uses a large proportion of the NextGen long haul network.

Commercially the non-metro areas are "cost centres" for Telstra, and in my opinion, Telstra would be doing itself a big favour in handing over its non-metro network infrastructure to NBN Co. In a synergetic move, it would also make a huge amount of sense that AARNet were to be handed over to NBN Co and then these networks could operate far more efficiently through economies of scale, and Telstra (and the Universities) could then wholesale purchase the network capacities as they require them as a win-win-win situation!

How the NBN can Help NSW

After some 28 years (ie since 1982) of proving that a competitive telecommunications infrastructure in Australia simply does not work (primarily because we have far too small a population density and secondly we have comparatively massive backhaul distances, and thirdly our CAN distances far exceed most European countries we are compared with); our successive Federal Government have grappled the hot ball of shame and finally it has been realised that Australia needs an inland telecomms infrastructure to replace that which would never happen thanks to the stonking in the Davidson Inquiry to introduce the Universal Service Obligation (USO) – hence the National Broadband Network (NBN).

I believe that both major Federal parties (in my opinion) "just don't get it" in still thinking that the NBN can be sold off as a commercial entity when in a few years time! It has been proven for decades that this will again fall into disrepair as it did with Telstra's hands tied to stop producing non-metro customer service and keep providing returns for its shareholders. Non-metropolitan telecomms infrastructure is nowhere near profitable enough to be operated in a competitive regime; even Telstra operates this infrastructure at a loss – hence the USO.

Refer to the Submission that I put to the NBN Expert Committee [2] in 2008, and the Submission that I put to the Select Senate Inquiry on the NBN2 [3], and these are all tied to a reference on my [Website](#) on the infrastructure and [these submitted documents](#) clearly explain the farce in privatising essential services – particularly telecommunications.

The NSW Government must realise that no business of any reasonable size can be supported outside Sydney because the Broadband infrastructure is far too thin to support industry. Therefore the NSW Government is derelict of its own duty if it has not already pressed very hard on the NBN management to extend the high capacity backbone through NSW and get regional NSW wired with Fibre to the Premises (FTTP) as matter of critical urgency.

Answers to the Questions

Improving Government Services and Efficiency

- (a) improving government services and efficiency in service delivery, including in the areas of education, health and justice services

One of the biggest lessons learned in having a telecommunications-oriented career is that efficient data management was the prime imperative, and the savings made through using rational data sets was absolutely immense.

It therefore directly follows that for high efficiency in service delivery, then the data sets used in all Information Communications and Telecommunications (ICT) related projects and systems in NSW and in particular education, health and justice services must use terminology that is commonly understood as standard. The only way to make all data sets standard is to work with a government-wide common “Data Dictionary” making the names of all data sets exclusive and the meaning of each data field name clearly defined and agreed on. It also means that wherever the definition of data sets/fields is found to be common, then only one name is to be used throughout the government for all ICT applications.

Data Dictionary Management an Imperative

As far back as the mid 1980s I was highly aware of the term “Data Dictionary” and much of my management work involved the coordinating of various project teams to ensure that they all used the same data definitions wherever possible. Although this seemed to slow many projects to a halt for a few months, inevitably many of these projects later merged their data sources and/or sinks (they worked with data that was common to a wide range of infrastructure equipment), and because the data dictionary became common, many of these ICT based projects simply slotted together like Lego® blocks.

If the NSW Government is really serious about improving efficiency in service delivery, then it must have a very active ICT Branch that has within it a very active Data Dictionary team that has the power to stop projects and systems that do not have total compliance with the common Data Dictionary. The common Data Dictionary is primarily a Federal Government Department issue that should be tied into the Department of Broadband Communications and the Digital Economy (DBCDE).

Even though most ICT projects may well be “Sydney based” in NSW, there is absolutely no reason to have the management of the Data Dictionary as a “Sydney based” initiative. All regional centres are crying out for work for their populations and it makes very good sense to ‘decentralise’ the Data Dictionary ongoing program into a regional city as the leadhouse role, and then have other regional cities operate to that leadhouse role. It is not as though the amount of data being transported is consistently high, but the content would be secure.

The DADHC Minimum Data Set

One of the outcomes from using the Data Dictionary in real life is that the Federal Department of Ageing, Disabilities and Home Care (DADHC) came up with what they termed as their Minimum Data Set (MDS).

Primarily this MDS was established because this department works with some thousands of ‘agencies’ that include voluntary and/or Non-Government Organisations (NGOs) and all these agencies provide feedback to the DADHC on a regular (three monthly basis) on the clients they have assisted, the assistance provided and where the funding (if any) went. Before the establishment of a common database, each organisation had its own database and its own data

dictionary, and it was virtually impossible to identify what assistance was going where and if some clients were appearing on more than one NGO listing.

In establishing this MDS, the DADHC also created a fairly straightforward algorithm that accurately names every client by a unique code, and as far as I know this code has not duplicated itself in over 10 million entries – and it is very unlikely to duplicate itself because the code involves the persons name and birth date in a sequence that to a large degree hides the persons name in the code. From my knowledge of encryption, I very much doubt that this code will duplicate itself in over 100 million entries.

To simplify the use of the MDS, the DADHC have contracted a software company in St Leonards to create a database management program so that NGO client entries can be loaded into their special program called Health Aged Disability System (HADS), and this system includes many ‘smarts’ in to check the Quality of the data being saved, and provide the reporting back to the DADHC in a standard format that their accounting systems can directly accept, load and analyse on a national basis.

Any client that gets assistance from more than one agency will automatically have the same unique client code, and their costs will be grouped and accounted for on a person-by person basis in the DADHC accounting system!

Although HADS provides a common data dictionary interface for the DADHC, unfortunately HADS does not provide a user-friendly interface for the end-users in the NGOs and consequently there is a large amount of paperwork that floats around many NGOs.

Since I have been volunteering as a Justice of the Peace (JP) in the Ku-ring-gai Neighbourhood Centre (KNC) for the past few years, I recognised the disjointed interface and the high amount of paperwork and put my ‘ICT-engineering’ head into use. As a consequence, I developed a very user-friendly computer-based multi-user support system that has the capability to completely remove almost all the paperwork, and seamlessly link with HADS to provide the client data as client support is provided. This system runs in Visual Basic over the Windows XP / Vista / 7 operating system, which is common in many NGOs.

Hospitals and Medical Services

In the light of the Federal DADHC actively using the Data Dictionary principles to very successfully introduce the MDS for NGOs on a National basis, it makes an awful lot of sense that the NSW Government must as a very high imperative follow this lead and ensure that all clients for all hospitals and medical centres, pharmacies etc use the same MDS (at least for client recognition, and living address).

My educated guess is that the MDS is there to be used and every hospital and medical organisation has found ‘multiple reasons’ why not to comply, and most of these reasons will come down to not having a user-friendly interface to the computing systems.

My educated guess is that because the Data Dictionary approach is not being followed, there are clients that have multiple registrations in a number of hospitals and medical centres over several years and the lack of enforcing the MDS approach is costing the NSW an immense amount of the medical budget.

In commercial terms, a typical project will have a 20% administration overhead (which is ‘spent’ on administration, advertising, payoffs, insurance, fleet, dividends etc) and 80% will actually be invested in producing the product (for example a telecomms network, a building, a bridge, a road, medical costs for a patient etc).

In government terms this administration overhead figure should be about 10% to 15% and about 85% to 90% for producing the product (because there is no advertising, no payoffs and no dividends - apart from Government Bonds)!

Considering my extended work experience in telecomms businesses, it was clear to me that with the Data Dictionary being implemented that massive savings would be developed because a huge amount of uncertainty would be minimised, and with that many management areas that unwittingly duplicated their work would be eliminated.

At least 20% of management overhead could be eliminated, and if these Quality techniques were rigorously implemented into the NSW managed hospitals and medical fraternity, pharmacies and private specialists practices, and aligned with Federal DADHC MDS then the NSW Government would be in a position to look beyond its inherently negative budget.

All Data Systems must be Nationally Based

The problem is that this inquiry is NSW centric and the roles of education; health and justice services are national. If any of the Australian States/Territories including NSW (or councils, shires etc within those States/ Territories) continue to persist with data systems in their areas, and the field titles in the database tables have not been referenced to and aligned with a national Data Dictionary, then these data systems will not align common data fields.

The problem of this non-alignment of data fields is that education, health and justice services based in NSW will have a very high management overhead, and these services will operate very inefficiently with many areas chronically under-servicing their clientele, and/or necessary services will 'slip through the safety net' because there is little or no correlation of common data between (and often within) departments.

Only recently the NSW Government announced that it would spread the responsibility of the Department of Community Services (DOCS) across several departmental portfolios, and although this is commendable, the spreading of fact alignment is mind-blowingly useless if the data gathered and saved in one database system cannot be readily and seamlessly aligned with data in many other database systems.

Introducing a National Australian Register

If such a state-wide community service is to operate with any degree of efficiency, then at a minimum, the NSW education database of school attendees must be on a common database table (register) with every student having a unique code to relate that students name and personal details that can be seamlessly linked to many other systems including a current address register (that also holds previous addresses and the time periods).

Likewise, all students need to be linked to their parents and/or carers, so that these addresses can be immediately identified for police and health issues. Likewise, all health issues need to be linked to every person, so no matter where they are, even not in NSW, their health record / medication details, X-Ray photos, criminal history, family support history, vehicle ownership / transaction details.

This list above is by no means comprehensive, and it very quickly shows that this education, health and justice services system must be national, not state based; and even then if State departments/ agencies are to use this data, then they must as the highest imperative use a common Data Dictionary and that this data needs to be 'globally' available.

Assisting the Police and Justice System

There is another data area that is vitally important and that is the linking of landline phone number data with current and past addresses – with the common link of individual unique person codes. This data is relatively constant, as people tend to live in one location for a considerable time and the numbers tend to stay with the location.

This data would then link groups of people over time to common locations, common phone numbers and even with the smallest bit of data analysis using NetMap® (a brilliant piece of Australian developed forensic linking software used worldwide by most crime tracking establishments), would link apparently isolated: social fraud, medical fraud, financial fraud, illegal drug and many other criminal activities through one common link peoples unique person codes!

With mobile phones this is another issue because mobile phones are attached to people, so the current and past numbers need to be attached to people (or conversely the people need to be attached to current and to past mobile phone numbers.

The underlying problem is that for many reasons, many people that have pay as you use card systems also have highly fictitious names (for example “Mickey Mouse”) and there is no correlation as to who these people really are. This issue makes tracking a mobile phone number to an area or instant pinpointing missing people (particularly younger people) almost impossible because there is no effective traceability between name and mobile phone with pay as you use card systems.

A tremendous saving of time and expense of NSW and Australian revenue would be harvested if all mobile numbers were correlated with ‘real people’ that have correlation on a national database that can tie them to a current address (and past addresses). If NSW initiated an Australian Register with the Federal Government (Attorney Generals Dept) and this got up, then this would be the first step in getting the mobile phones to have ‘known users’.

The process to validate all mobile numbers is rather simple by firstly getting all mobile numbers and matching the names up to existing people, and then cross-correlate those names and addresses with valid Australian names as on the Australian register, and then lock out groups of numbers asking them to provide their 100 point correct details at a registered office - like the Post Office, or the Dept of Social Security etc. With the details entered, the registration system would then send notice to have the line opened for normal use and that person would then have their unique code associated with their mobile phone number.

The next area that needs to be tracked to individual people is email accounts – in the same manner as fixed and mobile phone services.

Educating the NSW Education Department

As a Justice of the Peace (JP) and an active Volunteer at the Ku-ring-gai Neighbourhood Centre (KNC) in St Ives, I regularly (at least weekly) hear a very frustrated client come in to have a large number of original documents to be Certified as True Copies of the Originals, and these certified copies are required by a government area that has a direct link or even an association with the source documents. From a government business approach, this process is extremely inefficient as it takes a lot of time and resources to firstly get many of these documents unframed, then taken to be photocopied, then to get the photocopies certified, then returned to the premises to be re-framed. From that point, the person has to then compile a registered letter and send these all documents in for appraisal and approval. From a personal approach the NSW Government in particular looks to reek of total incompetence because most of those documents were provided through some part of the same Government business.

When getting to the bottom of the frustrating problem, inevitably it is one part of the NSW Government Departments (usually the Department of Education) wanting Certified Copies of many other documents that in reality are provided by none other than other Departments of the same NSW Government, or other State Government Departments or the Federal Government Departments. To compound the problem come clients have complained that they have to repeat the certified document fiasco regularly because the NSW Education Department 'lose' these certified documents after four years!

The classical and common case is a NSW qualified Teacher wishing to apply for a job in the NSW Department of Education having left the profession for whatever reason and now applying to again teach in a NSW Department of Education school! Documents that are required very commonly for Certified copies include at least:

- University Degree; original held by the relevant University – part of the NSW Department of Education
- TAFE Diploma, or Trade Certificate; original held by the relevant TAFE – part of the NSW Department of Education
- Institute of Teachers Certificate; part of the NSW Department of Education
- University Entrance Exam Certificate; original held by the NSW Department of Education
- Birth Certificate; original held by the NSW Dept of Births, Deaths and Marriages
- NSW Drivers Licence; original data held by the NSW Roads and Traffic Authority
- Criminal Records Check; part of the documentation held by the NSW Police Department
- Australian Citizenship Certificate; original held by the Department of Immigration and Customs

The first four sets of documents are within the NSW Department of Education, and with this alone; questions must be being asked as to how hopelessly incompetent do these NSW Departments have to be that the clients have to prove that they have certificates that were provided by the very body that they are applying into?

As various NSW Department bodies have this data, then these NSW Department and other Federal Departments should have this data it is a form that can be readily cross-referenced with relative tables with common identity keys to perform the cross referencing:

Linking of Relative Databases

The HADS database that is used by most NGOs uses special four-letter keys/fields in their database system that groups ranges of 'like' fields into several separate Tables – linked by a common Client ID reference number. Take for example the HADS database and check the grouping fields of two of many tables:

- Client Demographics (***DEMO***): **ClientID**, HACCLinkageKey, DOB, Sex, Title, GivenName, PreferredName, Surname, Religion, IndigenousState... etc.
- Client Address (***ADDR***): **ClientID**, UsualStreet, UsualSuburb, UsualPostCode, UsualState, UsualLGS, UsualSTD, UsualPhone, LivingArrangement... etc

It is very easy to see that these two database Tables are internally linked by the bolded **ClientID**. These HADS databases are relatively small (operate on PCs running Windows)

and there are thousands of these databases being used all over Australia in NGOs etc. that feed their client user data into the DADHC on a monthly basis using the Internet.

When this client user data goes into the DADHC it is the HACCLinkageKey field that is sent in and not the ClientID. The DADHC then has the facility to identify unique clients using more than one DADHC agency (service) through using the common HACCLinkageKey field that is unique for every person in Australia (and beyond).

The other interesting item about these two record-set field headings is that they have a bolded and italicised four-letter code that uniquely groups the client fields as ***DEMO*** and ***ADDR*** (short for Demographics and Address respectively).

With even the smallest bit of lateral thinking by the most inept of people, it should be obvious that fields if the ***DEMO*** table included the HACCLinkageKey codes then this table could reference other tables that also have the HACCLinkageKey as part of their common data set. Likewise with the ***ADDR*** table can be extended to include FromDate and UntilDate; so that when people move their new address would be entered in another record with the same unique code relating to the same person.

Solving Gross Incompetence

This demonstrated approach to data management system keeps the various groupings of data records well separated so that many Departments and Authorities can concurrently work with many different groups of data, and this data can also be pulled together as required to identify the necessary documentation without the need to any Certified Copies – because Adobe® PDF scanned copies of the originals would be on file in these records in these databases.

Establishing a secure database that uses the unique person code as the primary key is in-effect ‘child’s play’ for a competent data administrator, and in this case one recordset could be called EDUR (for EDUcation Records), an another as EDUC (for EDUcation Certificates), etc..

Education Records (***EDUR***): **HACCLinkageKey**, EducationFacility, MemberNumber, CurrentPhoto, CourseName, ClassName, TeacherLinkageKey, StartDate, ExamDate, ExamMark, AuxiliaryGrade

Education Certificate (***EDUC***): **HACCLinkageKey**, EducationFacility, CourseName, Grade, AuxGrade, CertificateNo, CertificateScan, CurrentPhoto, IssueDate

These tables are not all exhaustive / inclusive as other areas could manage the DEMO and ADDR aspects of everybody in these lists. All results from all schools, universities and TAFEs plus all private colleges can easily be loaded into such a system and people in the regional and rural towns and cities a crying out for employment – and this is a gimme!

This data management approach can easily be extended to cover the Drivers Licence (RTA), CRC (Police & Justice), Births, Deaths, Citizenship – and the list just goes on and on.

The obvious result is the idiots in the NSW Department of Education would not ever need to call on the patience of people willing to teach our population, and further these same idiots in the NSW Department of Education would have access to the database and virtually instantly be able to find out what type of expertise teachers have and where they live, so that the NSW Education Department can then be proactive to get the best teachers employed where they can do the most for Australia. ***All of this relative database record development work can be done in country cities and towns and engage the rural and regional communities.***

Engagement Of Rural And Regional Communities

- (b) improving the level of engagement of rural and regional communities in public life through new technologies

Augmenting the Skill Base

Recently I took a car to a local garage (in Hornsby) to have the Auto Transmission serviced and on returning to pick up the vehicle, I entered his 'little office' to pay the bill. With a few keystrokes he produced the bill, which I signed, he scanned and then attached the receipt after being paid. Being ICT savvy, I asked how he found working with office computers (as this one had grease marks everywhere). He praised the computing system and explained exactly how it worked and what it did for him, and then described the long process time that it took before he got this accounting system.

It is obvious to me that the over 45s do not need to be 're-trained' but have their training skills augmented from what they have now, and his geographic position in Hornsby is no different than any other geographic position where mechanical repairs are done – particularly in Regional, Rural and Remote areas of NSW.

In this case he did not need to use the Internet, but in most other businesses, having the Internet and having a fast Internet connection is an imperative, and without fast Broadband Internet connections most businesses cannot survive.

Teaching Seniors Computing

Having invested a few years volunteering as a tutor to teach seniors to use computers, and having then become the Business Development Manager for the Australian Seniors Computer Clubs Association (ASCCA) for a few years; I know that a high proportion of seniors like using the Internet for communications purposes, but many are frustrated because of the generally difficulties in setting up dial-up Internet and picking up the phone to check if the Internet is working was a major comprehension issue.

Because of these difficulties, I championed negotiations with Telstra to introduce "Broadband for Seniors" so that seniors could connect with ADSL in particular at cheaper rates, and that way they could be always on. As stated before, ADSL has a very limited useful range so living beyond the town fringes is a no-no with ADSL making ADSL rather useless in non-metro areas.

The beauty of seniors is that they already have a large degree of formal and informal education and introducing computing is not a new skill but in reality it is augmenting several of the skills that they already have. The real issues are that although many have very good keyboard skills from typewriter and teleprinter days, they generally lack mouse skills (which is easily addressed with several hours of 'Solitaire' or some other intensive and simple computer-based card game that does not involve the Internet.

Seniors like to learn in groups where there is no 'peer pressure' by tests. The learning process is almost totally reversed to that for schoolkids. For seniors the best learning process is to have other seniors teach them – not people under 50, because people under 50 generally do not have the patience, and want to go ahead well before every permutation of every possibility has been thoroughly worked through and repeated as many times as necessary so that they can remember the steps. And seniors are 'threatened' by people under 50 just because of their age and autocratic attitude, which seniors find very intimidating.

Office of Data Integrity

One of the biggest problems in having several databases is that the data needs to be ‘clean’ and without having expressly structured offices to analyse and clean this data, then this data is essentially useless. The example that I provided (above) about the incompetence of the NSW Department of Education asking for certified copies of documents produced by itself is a glaring example of how the NSW Government could get proactive and get its data clean and internally available – this makes extremely good business sense.

Country cities are ideal physical locations for this data to be analysed and cleaned, as the data does not have to be located in any capital city. Country cities have the workforce crying out for employment, and this workforce has the expertise and patience to work its way through piles of historical data and make this data into practical electronic data.

The NSW Government could establish regional branches of the “Office of Data Integrity” that would have as their prime role to cleanse and groom data so that information mining can work seamlessly and efficiently for the Police, Education, Social and Community Services etc. where unique personal coding associated with several different aspects of government and industry support will weed out those on habitual government handouts, those that are not being responsible for the children they have brought into this world, those that do not positively assist children to attend schools, those children that have a higher than acceptable truancy rate, those people that habitually call on voluntary community services when they are already government funded to cover those costs.

Group Targeted Family Guidance

Although the overhead of establishing regional “Offices of Data Integrity” is not cheap, the savings in not paying out for people that really don’t need or deserve assistance is immense, and social security is the biggest Federal Government ticket. Also the load and focus of social support groups such as the Police and Community Services will be such that people and their associated families in one part of ‘the system’ will very quickly be identified as being in other parts of ‘the system’ so Case Workers, Police, and Social Support groups can as a team (with common data) focus on these people and families and minimise the problems before they become major financial and social headaches in Australian society.

For example, I know of an excellent country regional Kindergarten Teacher who has a truancy problem with one of his class (this year). In his attempts to find the cause of truancy, he visited the students family home, only to find the parents out at the club/pub and the children unattended watching TV. He ascertained that the children don’t get to bed until well after the parents have returned home – which would be rather late – and the children will not wake until about mid morning – and that is why the children do not regularly attend school.

The other problem is that many children in his kindergarten classes do not get breakfast before being hustled out the door to school – so he brings breakfast to school for them out of his own pocket. The odds-on-chance is that these same parents are receiving social security payments and abusing the payments and their children’s upbringing.

Data mining using a tool such as NetMap® would identify a very high percentage of these cases if the data could be initially saved and then cleaned, groomed and then analysed. With case evidence on board it is then quite simple to launch specifically targeted programs to identify and resolve the problems associated with drop-out parents, and their associated family situations that draw very heavily on the NSW state resources.

Rural and Regional Business Opportunities

- (c) investigating the potential economic benefits from new technology on commercial and business opportunities in rural and regional communities.

Regional NSW Government Web Hosting

With even the smallest lateral thinking it makes very good government initiative to create a Web hosting centre that is distant from Sydney, inland and in a major regional centre. Not only does this strategy stop the constant pressure for Sydney to get even bigger; but also it reverses some of the nominally one-way data flow and that has a tendency to equalise the telecommunications traffic in the backhaul network.

For example if a serious Web hosting site was established and run in say: Cobar, Griffith, Lake Cargelligo, Wagga Wagga, Tamworth, Dubbo or Orange and the NSW Government moved its Web hosting from Sydney, this does not mean that those that use the Web host have to move to Dubbo or Orange, but staff that work with the Government in those regional locations can increase their Web hosting expertise, and there is the possibility of geographic diversity that makes the site considerably more safe and much faster for its users.

Regional International Web Host Mirrors

Currently most international sites are called directly via international long haul transmission systems into the countries where they reside, and in most cases the same data is downloaded on a continual basis, this makes a very over-used international network structure.

With a bit of business initiative from the NSW Government it could negotiate to establish a number of Web Hosting sites in inland NSW (well clear of the ocean coast), and have these sites structured as 'mirrors' of the international sites. These mirror sites can bring with them a considerable financial and business gain for Australia and in particular NSW.

Telephony traffic is much like road and rail traffic, and basically the same engineering rules for all these traffic mediums are virtually identical. Traffic is fundamentally bi-directional for telephony, email, VoIP, road (car and truck, road-train etc) and rail (carriages) but when it comes to Internet with Websites, and with Broadcasting, this traffic is fundamentally unidirectional from the server with a low backflow to the server from the customers.

This almost unidirectional traffic flow is why CAN technologies like ADSL work reasonably well for Internet when using Websites. The extended problem is that the Backhaul will also carry a virtually unidirectional traffic flow from the servers to the customers, and this leads to a rather poorly utilised network infrastructure – even with third generation digital network structures now being based on TCP/IP suite of protocols, and even though they can carry traffic at rates exceeding 10 Gb/s per fibre without Wave Division Multiplexing (WDM).

There are significant costs in using international routes (much like a toll way) and the traffic lanes are not that wide (fast), meaning that traffic is delayed, and has to travel long distances. When Internet Protocol (IP) signals between receiver and transmitter, the IP usually does so in a series of packets of data (called datagrams), and these packets are checked (and if possible corrected) for data integrity. If the data cannot be corrected (and that is not uncommon), then the datagram is resent and the whole procedure repeats itself. This process should explain why, when an International Web host is called, the screen takes some if not several seconds of latency as the screen fills up – even though the local CAN download speed might be in excess of 25 Mb/s, the bottleneck is usually in the upload link of international network congestion.

With international mirrored sites in the NSW inland, this innovative infrastructure plan puts the mirrored sources for international Websites inside Australia totally cutting out several thousand kilometres of transmission systems out of the picture and that removes a very significant amount of the inherent transport and latency delay that is caused through having to circumnavigate the globe, as the mirrored Web-host would at the most be less than 700 km and typically about 200 km to 400 km from the average customer in NSW.

Business Advantages for NSW (and Australia)

There are three main business advantages for NSW and Australia: In the first instance, because there is a much-shortened geographic link distance, and because the connecting link will be very high capacity, the slowest part of downloading will be the CAN download speed. We already know that many Web host arrangements outside Australia operate on upload speeds less than 256 kbit/s and by having a mirrored host site in inland Australia the upload speeds from the mirrored site will exceed 50 Mb/s, making Internationally viewed sites appear virtually instantaneously.

In the second instance the traffic flow will self-balance internally in Australia through the NBN infrastructure, because the Mirrored Websites will be inland, and not on or off the coast via international long haul routes. The international through Darwin will dramatically increase in the next decade as Darwin becomes a major city, and as the mirrored sites dramatically increase in number in inland Australia there will be a substantial traffic flow OUT OF Australia, and this will go a long way to balance the payments for International telecomms traffic flows, which currently is very unbalanced INTO Australia.

In the third instance international / overseas businesses sites will actually pay to have their sites mirrored in Australia because of the stable geographic land, the stable government and the advantage of having their sites not in mainland Asia. If the NSW Government can see how to capture this market (and be very active about it) then this ICT industry has the potential to be a very big inland regional business product

This Website hosting and Website managing is very potentially a new business line for regional NSW that can be the economic bridge to bring ICT expertise into regional areas and out of the major coastal cities (like Sydney).

The synergy of bringing this work out of Sydney and making it based in regional centres (after the inland NBN Backhaul has passed through these centres) is that:

- With the Web hosting now being located in geographic diverse locations other than Melbourne, Brisbane and Sydney is that buildings are inherently far cheaper than those in Sydney,
- There are many people that actually love living in the 'outback' and are hi-tech types, so there will be no shortage of potential ICT oriented staff that simply don't want to live in Sydney or its suburbs;
- Businesses that are regional will jump at the opportunity to work with local businesses that have ICT skills because most country folk prefer to discuss business over the table, not on a video conference;
- Regionally based ICT businesses will have a much lower overhead than those in Sydney;
- The Broadband Backhaul will be used to a far greater extent because the Website hosting will be local or wet of most users, not international or in Sydney.

This synergy brings with it another dimension in that other ICT industries that until now were purely capital city based can relocate west of the Great Dividing Range by several hundred km.

Regional Electronic Document Backup

Western NSW is particularly stable in geographic terms and much of that area is not flood prone. Most businesses need stable locations that are well isolated from places like Sydney to hold their duplicate electronic documents.

As far as I am aware the ASX has its main data storage in the Sydney CBD and their national backup in Bondi Junction. To me this situation reeks of mindless Sydney-centric stupidity, as anywhere else but the Sydney basin would be fine (Wagga Wagga, Tamworth, Cobar are excellent examples of locations that could host electronic document backups – but the high capacity network infrastructure stops at about Blacktown, Liverpool and Pymble.

Other good locations could include Toowoomba, Ballarat, Shepparton, Bendigo, Wangaratta, Longreach, Peterborough, Broken Hill, but few – if any of these have any substantial Broadband backhaul infrastructure, so again the NBN has a lot of work to do before any regional centre can be used for data intensive management and/or harvesting.

Visual Animation Studios

Recently we were made aware that the blockbuster animated film “Avatar” was to a very large degree developed in Adelaide, and the new version of the animated film “Happy Feet” is being developed in Sydney.

While I have no doubt that the studios to develop the staging of these entertainment packages is rather expensive (and executives tend to stay on the coastal fringe of Australia), the overhead costs for setting up electronic animation studios is not all that high – but the transport of animation video is bandwidth intensive, and this is where the use of the NBN backbone becomes an imperative.

By having the backbone of the NBN backhaul running north-south through western NSW with spurs to the east coast and Victoria, this massive bandwidth capability completely opens the inland on NSW to new employment opportunities that do not involve working on the land, but working inland, with high capacity low cost spurs to the coastal cities and between the country cities.

IT services employment that would never be considered outside Sydney (CBD for that matter) can be openly decentralised several hundred km west of the coast, where Visual Animation is but one opportunity, and there are several others like Insurance claim processing, and a string of data processing and editing services that are not Sydney centric.

Sheep and Cattle Marketing using Internet

Currently graziers arrange through a Stock & Station Agent to partially sell their herds or stock up depending on many business factors. For selling; Once they have made that arrangement they then have to pay a carrier to transport their head to the sale yards where the stock are Auctioned.

For buying; A grazier either contacts a Stock & Station Agent and finds out where what type of cattle / sheep are available and then either makes an attendance and bids as per anybody else or arranges the agent to bid on their behalf. Once the deal is struck it is then up the grazier to arrange transport and pay for the carrier to transport the stock.

No matter which way you look at it the grazier is hit with the biggest costs and is in the worst position to trade.

In a very similar way that E*Trade shocked the Australian financial world into actually working for a living instead of stealing money for doing next to nothing; with Broadband it will be possible for a grazier to put their stock up for trade on a Broadband marketplace without any transport expenses.

The buyers will then have the opportunity to discuss directly with the sellers and deals can be struck with minimum interaction of Stock & Station agents. At that stage transport can be arranged between the graziers (on a say 50/50 basis) minimising the transport costs, damage to the stock and maximising the sale price for the graziers.

The NSW Government would be derelict of duty if they did not actively participate in the development of a free to use Website for this trading purpose, and if the appropriate department got it right (and it really is not that hard), then this practice should go National.

My estimated guess is that currently graziers lose about 15% of their stock head value because of double transport costs to and from the stockyards including the holding fee while in the yards. There would be no transport to and back from the yards if stock did not sell (and that is not uncommon) as this is an appreciable overhead that can be entirely avoided. These transport costs could be reduced to less than 4% of the stock head through Internet based trading. The Stock and Station agency costs of about 10% could be eliminated, and the stock would be transported directly from one site to the next resulting in far less trauma and stock loss.

Considering that the wholesale price to the abattoir remains constant, then I believe that the graziers stand to gain at least 21% more profit per head – more like 30% per head considering the stock when transported a minimum distance and time will be considerably more healthy because there is no stop-over for up to several days in stockyards.

Acronyms

AARNet	Academic and Research Network
ADSL	Asynchronous (directional speed) Digital Subscriber's Line
ASCCA	Australian Seniors Computer Clubs Association
ASX	Australian Stock Exchange
CAN	Customer Access Network
DADHC	(Federal) Department of Ageing, Disabilities and Home Care
DBCDE	Department of Broadband Communications and the Digital Economy
FTTP	Fibre to the Premises
Gb/s	Giga bits per second
HADS	Health Aged Disability System
Hz	hertz
ICT	Information Communications and Telecommunications
JP	Justice of the Peace
kHz	kilo hertz
km	kilo-metre
KNC	Ku-ring-gai Neighbourhood Centre
M	Million
Mb/s	Mega bits per second
MDS	Minimum Data Set
mm	milli-metre
NBN	National Broadband Network
NGOs	Non-Government Organisations
NSW	New South Wales
PDF	Public Domain Format
PDH	Plesiochronous Digital Hierarchy
PMG	Post Master General
ROI	Return On Investment
SDH	Digital Synchronous Hierarchy
SMOF	Single mode Optical Fibre
STM-1	Synchronous Transport Module
TCP/IP	Transmission Control Protocol / Internet Protocol suite
TV	Television
USA	United States of America
USO	Universal Services Obligation
W-CDMA	Wideband Code Division Multiple Access
WDM	Wave Division Multiplexing
WTO	World Trade Organisation
WW2	World War Two

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