



Inquiry into the role and potential of the National Broadband Network

The Committee will examine the capacity of the National Broadband Network to contribute to:

- a) the delivery of government services and programs;*
- b) achieving health outcomes;*
- c) improving the educational resources and training available for teachers and students;*
- d) the management of Australia's built and natural resources and environmental sustainability;*
- e) impacting regional economic growth and employment opportunities;*
- f) impacting business efficiencies and revenues, particularly for small and medium business, and Australia's export market;*
- g) interaction with research and development and related innovation investments;*
- h) facilitating community and social benefits; and*
- i) the optimal capacity and technological requirements of a network to deliver these outcomes.*

ic.reps@aph.gov.au

Dear Committee,

This submission covers items a) through h) as item i) is trivialised by the decision to use optic fibre as both the backbone and major end-user delivery mechanism for the NBN. The only requirement for 'optimal capacity' is that the NBN be ubiquitous.

As a private individual, I claim no authority on the terms of reference other than that which can be expected from any member of the public, save for the fact that I currently work for a large multi-national organisation in a role that requires my technical expertise in delivering a range of technology solutions to commercial, corporate and government clients across a wide geographic location spanning approximately half of the Eastern Sea Board.

To make this submission as reader friendly as possible, I have chosen to simply bullet point the impact statements for each term of reference.

How will the NBN contribute to;

a) the delivery of government services and programs

- The ubiquitous nature of the NBN will give the Government a far greater ability to reach individuals without the need for physical travel.
- Services and products can be tailored to the 'audience-of-one' via dynamically generated information portals rather than the 'one-size-fits-all' approach currently required by centralised walk-in service centres.
- Advertising can be targeted at individuals rather than broadcast through traditional media services.

- Funding can be diverted from the cost of maintaining and staffing large customer service centres in high rent and high wage inner city locations to regional data centres, call centres and processing centres. This also creates benefits for regional areas in both economic development and job opportunities away from the cities (e).
- With lower cost delivery mechanisms, more funding can be allocated to improving service by automating processes and hence reducing errors.

b) achieving health outcomes

- While telemedicine has been touted as a benefit the NBN may bring, the detail has been rather scant. With the huge data capacity and low latency connections only a fibre optic network can deliver, the options for telemedicine are phenomenal.

Take these current technologies for instance:

- Remote diagnosis from specialists in a competitive bid environment. It works like this;
 - A health practitioner in a clinic receives a patient suffering from a condition. After preliminary checks and questioning reveals a number of possibilities, the practitioner seeks a specialist opinion.
 - The health practitioner opens an e-health portal and uses a bidding system to navigate to a page that lists all available specialists in the field they require. The system may also include the specialist peer review reputation, estimated wait time, current queue information, and fee (and possibly gap).
 - The patient can choose from the list based on how long they wish to wait, how much they are willing to pay, and how well the specialists advice has been rated.
 - In a free market, this would open newly practising specialists to thousands of potential patients, while allowing semi-retired and highly respected specialists to operate from home offices at times convenient to their lifestyle, at a price the 'market' was willing to pay for each.
- Remote observation and telemetry
 - Monitoring patients is expensive. Monitoring patients in a hospital is even more expensive.
 - Geriatric, blind and disabled patients are far less likely to suffer a fall or other complication from an environmental change when recovering or being treated in their own home. Familiarity of surroundings is crucial in the care of these types of patients.
 - Programs that allow patient monitoring by a remote worker of a patient in their own home over a redundant and/or alarmed fibre network can provide real-time vitals, orientation, stability, movement and a host of other data streams for patient care.
 - With the unlimited data capacity of fibre, patients can also opt for video monitoring feeds.
 - In time, visiting health practitioners or nurses will carry 'doc-in-a-box' probes and other such gadgets that would ordinarily require large and cumbersome machinery to operate. These probes will remotely transmit the data back to a centralised processing facility where the machines are located, effectively making medicinal equipment previously only available in a hospital into a portable device.
- Electronic Health Records

- Having access to a single source of medical information ranging from reports to images is vital when treating patients.
- Having a secure and ubiquitous method of accessing such information is also vital
- Using a two factor authentication system, a health practitioner would be required to request a record, the record management system would request permission from the patient (via something as simple as a text message), and the patient would authorise the access.
- Once access has been granted, the system logs the activity of the authorised doctor in the record and reports on views/changes/additions to the patient, increasing transparency.
- For particularly sensitive data, additional authorisation would be required.
- Every hospital, clinic and doctors office that has a terminal capable of connecting to the network would be required to license their connection annually in addition to obtaining a certificate of compliance for security purposes.
- For security reasons, the system would be virtually isolated from the public internet in much the same way that the PACS network in a hospital is isolated from the standard data network in today's environment.
- The NBN allows for, in even the simplest ONT, up to 4 data services thus allowing the e-health network to remain isolated from the internet while delivering all the benefits of high-speed ubiquitous data services.

c) improving the educational resources and training available for teachers and students

- Ubiquitous links to an educational network will revolutionise the way in which our children receive their education. Since the 1800's the formal approach of the teacher delivering course material to a group of students has remained steadfast, diverging only slightly with the introduction of laptop computers and wireless LANs in schools. With high speed links available over the WAN, the greater sum of all faculties of study becomes instantly available to any student in any school with links to the home as well as any school capable of supporting mass telepresence connections.
- School of the Air and distance education have been a way of life in Australia's vast expanse however the number of people required to deliver a quality education per student is vastly disproportionate to the standard schooling approach. With high speed networks, high definition video and IP multi-cast capability, distance education will actually become more economical than a traditional school based education. Overall, lower funding will be required for education as low enrolment schools can have administration and teaching overheads significantly reduced.
- Classes can be received on-demand and in any language. Fewer people would be required to deliver educational content to mass audiences.
- Higher Education examinations can be corrected/marked by several thousands of part time workers in any location with greater accuracy and quality assurance than at present.
- Cheating can be more easily detected once educational assessment material is moved to electronic formats.
- Results can be delivered in real-time to parents via several modes of communication
- Parent-Teacher interviews can be done at times suitable to both parties with location trivialised by high definition telepresence technology.
- Ongoing teacher training can also be delivered in the same mode reducing the need for teacher to travel to centralised adult education facilities. The training could also be given

more regularly, with better feedback and collaboration across varied fields of expertise.

d) the management of Australia's built and natural resources and environmental sustainability

- The only impact the NBN may have on the management of natural resources is the ability to track reserves in a way that removes the paradigm of private ownership of those resources. This point goes well beyond the scope of this inquiry.
- Environmental sustainability is chiefly benefited by the reduced reliance on transportation for knowledge workers. Shorter journeys and less congestion on the city roads will have a massive impact on the volume of vehicle emissions
- Fewer intercity air movements will be required as telepresence becomes the normal way of meeting.

e) impacting regional economic growth and employment opportunities

- Regional Australia stands to benefit from the NBN more than any other sub-group for several reasons.
 - Knowledge processing will no longer need to be concentrated in the cities. With far lower overheads required to operate in regional areas, private enterprise will begin to move jobs that require human presence to those lower cost areas.
 - Opportunity will no longer be the driving force that pulls young adults from the regional areas to the cities; many of those jobs will be relocated to remote operations centres in regional areas.
 - With fewer people leaving, and the probability that several people will move from the city out (or back) to regional communities, regional growth will follow.
 - As household Internet service penetration increases, online merchant services will allow small and rural manufacturers to be able to offer their goods to a much wider market.
- Ubiquitous data connections will eventually allow agribusiness the ability to manage much more dispersed supply chains. Food crops will be managed in such a way as to prevent oversupply and undersupply price fluctuations if farmers can see what they should be growing instead of guessing or working on what the market did last season.
- Growing co-operatives will no longer be limited to small communities. The NBN will potentially allow many, many growers of particular crops to share knowledge and experience in real time.

f) impacting business efficiencies and revenues, particularly for small and medium business, and Australia's export market; and

g) interaction with research and development and related innovation investments;

- Ubiquitous connections will allow for much greater specialisation in business. Instead of every business having to absorb the overheads or 'running a business', small to medium businesses will be able to access outsourcing providers for many services not currently able to be offered, allowing them to focus on their core specialisation. The opposite is true for the outsourcing suppliers who will then have an expanded market of businesses seeking services, allowing efficiencies to grow for both the supplier and the buyer. These services may include specialist typing pools (e.g. medical), data entry clerks, HR services, payroll

services, etc.

- Cloud based services will dominate the market and small businesses will no longer have to spend large percentages of revenue on internal support for services such as IT and telecommunications. Efficiency gains will come in this area from businesses only paying for what they need rather than what is available. The need to support large, expensive systems will also be transferred to the cloud hosts.
- With the world's best telecommunications network, it is highly likely that small businesses will be the first to move to efficient and lower cost utilities such as cloud computing, IP telephony and telepresence.
- With the increase in demand business communications and workflow enablers will receive, Australia is likely to become the hub of business innovation in fields such as IP telephony, telepresence, remote sensing, remote operation, distributed workflow, and much more.
- Being the front runner with technology, Australia stands to become the 'test bed' for many new technologies and that can lead to exports once other countries improve their own telecommunications infrastructure, providing the development is encouraged locally.
- Research itself will benefit greatly from the ability to move huge volumes of data around the country with ease, increasing collaboration and reducing development time.
- Research that requires work to be carried out at particularly useful physical locations can transfer raw data to specialised facilities much faster than before, allowing teams to remain in field (on-site) longer. Teams could also have access to a greater array of services as the links to each would be largely universal

h) facilitating community and social benefits

- The NBN will, if delivered as planned, remove the digital divide between not just the city and the bush, but also areas within cities. The overall social benefit is equality. Equal opportunity, equal service availability, equal access to resources, the list goes on. With equality we remove most of the problems that lead to crime, reduce the incidence of individuals being left out or left behind, and increase the ability of those who can help to access those who need help.
- There are hundreds if not thousands of projects going on right now that aim to get social and community services on-line. Ubiquitous and cheap data transmission will mean these projects reach more people.
- Every current Telstra phone booth will eventually become an access point for not just voice services, but data services as well. Like many other countries that already realise the benefit of making the location of community and social services freely available, the humble telephone booth can be transformed in to an 'information kiosk' because data will cost nothing and everything will be online, meaning both types of services can be utilised to a greater extent.

Submission from Daniel Bryar; private individual