



Mr Andrew McGowan  
Standing Committee on Infrastructure and Communications  
Po Box 6021  
Parliament House  
CANBERRA ACT 2600

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**Supplementary Submission to House of Representatives public hearing on the NBN**

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**A) Curtin University Student Numbers**

Total number of students enrolled at Curtin campuses (please indicate whether gross number of FTE) **46,634** headcounts based on final outcomes in 2010 (Source: Student web statistics)

No of onshore and offshore students making up this number **37,460** headcounts onshore (26,758 domestic and 10,702 international) and **9,174** headcounts offshore based on final outcomes in 2010 (Source: Student web statistics)

Our ranking for **highest number of students in Australia 6<sup>th</sup> based on 2009 data** (Source: DEEWR 2009 Full Year Student Statistics)

Our ranking for **highest number of international students in Australia 3<sup>rd</sup> based on 2009 data** (Source: DEEWR 2009 Full Year Student Statistics)

**B) Curtin Research Project Relating to Broadband**

**Video Conferencing in Health**

Associate Professor Clare Rees has extensively researched the application of videoconferencing technology in the provision of mental health services. The main finding has been that this technology has the ability to improve access to mental health assessment, training and treatment for individuals who are isolated due to distance or other factors such as disability. This is an important issue in Western Australia where according to the Australian Bureau of Statistics (ABS), 31.5% of Australia's population (6.8million people) live in non-metropolitan areas (Australian Bureau of Statistics). Rural and remote populations have higher rates of accidents, suicide and exposure to violence (AIHW, 2006) as well as increased rates of various risk factors known to play a role in the emergence of psychological dysfunction, including poor physical health, obesity, smoking, drug abuse, high blood pressure and poor nutrition (NRHA, 2004). People in rural and remote Australia are in the highest need of specialized mental-health services however, due the lack of specialized clinicians working in these areas the accessibility of those services frequently range from little to none (NRHA, 2004).

Videoconferencing (VC) technology enables both visual and audio real-time high quality information to be transmitted across secure networks via user-friendly interfaces. Logically, VC technology bares the highest resemblance to F2F interaction currently available. Our research to date has shown high rates of satisfaction with services delivered in this manner as well as equivalent outcomes for treatments when compared with face-to-face control groups.

Additional funding will enable researchers to broaden research activity and translate this knowledge into other contextual domains such as education, finance and e-Government.

A key area of research Curtin is keen to progress is evaluation of 'Train the Trainer' programs ability to improve community health programs through online training supported by educational mentors in key geographical locations.

Further Information:

Curtin Health Innovation Research Institute (<http://healthsciences.curtin.edu.au/research/chiri.cfm>)  
Assoc Prof Clare Rees –  
Prof Garry Allison, Dean of Research,

**Standardised Patient Consultation Training**

Curtin currently has projects that include

- a) What factors lead to unsafe prescribing practices for older drivers with chronic illness? Dr Moyez Jiwa supervising Dr. Marthe Smith.
- b) How do GPs manage patients' problems in the period after breast cancer treatment? Dr Moyez Jiwa supervising Dr. Shohreh Razmi

Curtin would propose the following project: Actors are trained to present as patients with specific clinical problems (e.g. symptoms of a chronic illness) Clinical scenarios and scripts are produced with reference to general practitioners and other relevant experts in the field. General practitioners are then invited to consult these 'standardised' patients and the consultations are video or audio recorded. The recordings are scored using a validated consultation quality schedule such as the

Leicester Assessment Package.<sup>12</sup> The consultations are scored by two teams of independent experts: general practitioners and specialists in the relevant domain of interest (e.g. surgeons, cardiologist, aged care experts etc). The scores from the two sets of experts are compared to determine if the GPs address a specific clinical problem when assessed by experts using the same validated schedule but from different disciplines and to generate hypotheses as to how the clinical problem can be better addressed with particular reference to the consultation in primary care.<sup>13</sup> This technique has also been used by the applicant to field test innovations that may be deployed within the context of a medical consultation in primary care. The technique has been adapted by the applicant to explore whether it is possible for health practitioners to consult patients with chronic illnesses safely using video technology without the need for either to be in the same room. The implications of research in this field will have a considerable impact on the delivery of healthcare to patients in rural and remote Australia.

### **Communications Economics**

Curtin currently has projects that include

a) **Local Monopoly and Competition in Internet-enabled Markets**

Received empirical analysis mainly focuses on explaining pricing strategy in markets comprised of Internet-enabled and conventional firms. However, these analyses do not consider how firms position themselves when conventional and Internet-enabled firms compete for heterogeneous consumers. That is, firms consider the distribution of consumer taste and decide what type of business to establish. The analysis develops testable propositions concerning the relative magnitudes of elasticities that shed light on whether location matters, viz., the relative ease with which a local monopoly is established in a market contested by conventional and hybrid firms.

b) **SME Competition in Digital Markets**

Competition in many electronic markets involves rivalry between 'Bricks and Clicks' firms, which operate both traditional and on-line vendors, and entrants who rely completely on Internet sales. In many cases, the goods being offered are identical-only the channels by which they are distributed differ. Both demand characteristics and production costs can be expected to differ between traditional and virtual distribution networks. This article analyses post-entry performance of a unique sample of Australian virtual entrants who face incumbent blended channel competitors. The fate of these entrants depends not just on their abilities to discern relevant parameters of the underlying environment, but also on incumbent response to entry. We seek to identify and characterize those features of product markets and cost conditions consistent with survival of virtual entrants.

c) **Modelling OECD Broadband Market**

In February 2004 the OECD Council adopted the Recommendation of the Council on Broadband Development (OECD 2004b) which calls on Member Countries to implement policy to assist national broadband growth. In particular, the Council on Broadband Development (OECD 2004b: 2) recommend Member Countries implement: (a) regulatory frameworks that balance the interests of suppliers and users; (b) policy that promotes access on fair terms and at competitive prices; and (c) effective competition and continued liberalisation in infrastructure. This paper specifies the equilibrium penetration and price equations for estimation in a two-way error components framework. Inclusion of fixed-time effects allows temporal deviation from equilibrium. To address bias from endogenous and lagged-dependent variables, a system general method of moments procedure is used to produce consistent estimates.

d) General Purpose Information Technology and the Digital Divide

This study provides the structure of a model developed to address issues associated with the digital divide between developed (North) and developing (South) nations. Building on insights in growth theory, the analysis posits firms in the North and South with characteristics appropriate to firms in the ICT sector that have an incentive to joint venture to capture additional network benefit. The question arises, in an era of significant technological evolution, whether the benefits are spread or are capable of being spread, in such a fashion so as to ameliorate the substantial economic imbalance between the North and South. It is evident from the reported results that hoped for technology transfer solutions to necessitate growth and convergence, are too simplistic. A particularly important factor that is highlighted is the influence of substantial asymmetry in the impact of uncertainty. Since a high speed of technology change can exacerbate asymmetric uncertainty, it is particularly important to investigate mechanisms through which this effect influences private sector decision making and identify available policy parameters to ameliorate the impact of the evolving digital divide.

The Australian government has increasingly placed a high priority on the availability of a competitive broadband infrastructure and look to international benchmarks as an input to assess progress in meeting policy objectives (OECD, 2007). Benchmarks include broadband penetration, pricing, availability and speed. However, the most frequently cited benchmark is broadband penetration and this measure is driving policy initiatives in many countries. In particular, in March 2007, six months before the election, the then leader of the Opposition Kevin Rudd unveiled plans for a national broadband network putting broadband forward as a major election issue, and in doing so cited Australia's relatively low ranking in OECD broadband penetration. Senator Conroy stated recently the new network will be 40 times faster than current speeds and reach 98% of Australians. The remaining 2% will receive a standard of service as close as possible to that offered by the new network, using the best available wireless, microwave and satellite technology. The Labor Government promised to spend \$4.7 billion of public money for a national high-speed broadband network with a matching contribution from the private sector.

With the early estimates of subscription reported as low, a future study on NBN will:

- (a) Provide a data set containing information on OECD Member Country broadband penetration and price, income, population density, and addressable market and other policy-relevant variables;
- (b) Identify important factors determining the speed and spread of OECD Member Country broadband penetration. Thus far broadband penetration studies consider only the European Union and individual intra-country analyses. The results of this analysis will provide a base for benchmarking Australian broadband market penetration via international comparison (this has not been done before); and
- (c) Conduct a survey of Australian remote, regional and metropolitan areas that contains both the characteristics identified in (b) above and a pricing experiment. The intention of the experimental analysis of pricing is to assist in the devising of 'attractive' packages (by region) to encourage network subscription.

Further Information:

Communication Economics and Electronic Markets, Curtin Business School

<http://www.business.curtin.edu.au/business/teaching-areas/economics-and-finance>

Prof Gary Madden, Professor –

**Broadband Technology Adoption**

Technology adoption is one of the research focus areas for the CBS School of Information Systems. Past and current projects investigating various areas of this issue have been conducted, including the adoption of collaboration technologies, next-generation protocols and e-government, as well as Internet adoption generally. Widespread NBN adoption will be essential in order to achieve the projected community and productivity benefits; it will not be possible to assume that “if you build it they will come”, and therefore focused research to inform strategies to maximise adoption will be crucial to enabling the NBN to achieve its potential as a truly nation-building project.

Further Information:

School of Information Systems, Curtin Business School

<http://www.business.curtin.edu.au/business/teaching-areas/economics-and-finance>

Dr Peter Dell, Head of School –

**Sustainable Community Development**

Geraldton-Greenough Project

The ARC project Australian Research Council (ARC) Linkage project Transitions to a Sustainable City - Geraldton WA: An applied study into co-creating sustainability through civic deliberation and social media is jointly run between Curtin University and the Geraldton-Greenough council.

The project draws on iVEC high performance computing and visualisation labs in order to map citizen and government decision-making on climate and regional development issues.. While decision-making is the end-point of the project it is equally important to have means by which to address how people feel about topics in their everyday conversations. For this purpose, Dr Brett Adams’s social mood reader has been adapted for the Geraldton-Greenough project. The mood reader was originally developed by Adams for autistic groups who wanted to be able to check, quickly, the feelings of the different people within their network, not only in terms of text but in terms of pictures. Google and other companies provide social network analyses or indeed ‘buzz’ metrics of data using computational semantics. However, this program is based on linking data and pictures to psychological mood. Each group and individual is as a result mapped according to colours chosen to represent mood. Yellow for exciting, for instance. This is an innovative way of understanding conversations and mood in the Geraldton-Greenough region.

The project has also developed Civic Evolution, a Web 2.0 tool and site that enables people to put forward proposals for formal consideration and working through with the Geraldton-Greenough Council and other citizens.

Additional funding would enable evaluation of the value of such projects to regional communities enabled by broadband infrastructure and will inform roll-out of similar online communities as infrastructure becomes available. Comparative studies in urban Local Government Authorities would also be a key priority especially in early roll-out sites.

Further Information:

Curtin University Sustainable Policy Institute <http://sustainability.curtin.edu.au/>

Prof Janette Hartz-Karp

Centre for Culture & Technology <http://humanities.curtin.edu.au/about/staff/index.cfm/M.Balnaves>  
Prof Mark Balnaves

### **Square Kilometre Array**

Curtin University is a leading institution in Western Australia helping to establish radio astronomy as a new research field in the State. In particular, Curtin University is heavily involved with the Square Kilometre Array (SKA) project, at both national and international levels. The SKA could be a very heavy user of a next-generation national research network that utilises NBN infrastructure. Prof. Steven Tingay, a Curtin University employee, made a written submission on this topic to the committee and also provided evidence in person to the committee in Perth, outlining the potential role of the NBN to support the SKA.

### **Further Information:**

Curtin Institute for Radio-Astronomy Research [www.astronomy.curtin.edu.au](http://www.astronomy.curtin.edu.au)  
Prof Stephen Tingay, Director –

### **University Impact**

Curtin has invested significant resources in providing learning technologies that support online learning. The university is now the leading provider of online courses through Open Universities Australia and is currently developing its own fully online courses in Commerce, Humanities and Health Sciences through Curtin Online. The university as part of its compact with the Federal Government is looking to increase students from regional areas of the state. With this in mind a project that looked at the impact of the NBN on online higher education in regional and remote areas of WA would be of great interest.

As with most universities, Curtin has a large number of students residing within close proximity. The strain on university resources such as computing and lecture facilities means that being able to provide some services with student residences would be a key focus of maximising the potential of the NBN. Similarly, the strain on physical resources would see a focus on development of virtual infrastructure (Tele-work) that will enable academics and professional staff to perform some duties from home.