

**Innovative broadband provision for Australia's networked future**

**A submission to the Minister, Senator the Hon Stephen Conroy**

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\* The views expressed here are mine and do not necessarily represent those of the University

**Overview and personal standing:** This submission refers to the Labor government's proposal to establish a national broadband infrastructure. I write as a person with professional and personal interest in Australia's digital telecommunications network and am recognised internationally as an expert in matters concerning content development and distribution for broadband networks.

My professional credentials include a Canada Research Chair awarded to me to develop national broadband content infrastructure in Canada; several related ARC research grants that led to the development of Australian Creative Resources Online ([www.acro.edu.au](http://www.acro.edu.au)), a digital repository of content primarily designed for use in education; research excellence awards from the Province of Ontario and the University of Queensland for outstanding research into key areas of broadband content development; and my current position as Director of QUT's Institute of Creative Industries and Innovation, all of which give me a comprehensive overview of the issues surrounding this important area of national infrastructure development. My international professional networks include leading researchers in IT, Law, Business, and Software Development from icons such as the Bell Institute for Computer Research at U Waterloo, the Internet Archive, Alexa, and Creative Commons.

My personal interest in our national communication network stems from my earliest years. My father worked from the age of 14 in the PMG, Telecom, and Telstra until his retirement during the period of Telecom privatisation in the 1980s. He was an active figure in the development and modernisation of our national phone network, overseeing numerous major and minor exchange transitions to subscriber trunk dialling and automation. He was passionate about access to telecommunications, recognised the significance of our communications systems, and was ever mindful of the challenges that our population and geography present to equitable and universal access to telecommunication infrastructure. Such issues were table talk for our family and it has in large part shaped the views I present here.

**The problems:** There is no need to rehearse the fundamental challenges facing any Australia-wide telecommunications system. Those problems are related to distance,

urbanisation, and sparse population. I will not say any more on these because I assume they are taken for granted.

Since marketisation of Telstra, the fundamental problems of Australian telecommunications have been exacerbated by business principles: it is simply not good business to provide remote and rural Australia with same services for the same prices that are available in our major cities. Yet this must be the case. The national telecommunications infrastructure is a public good because our nation requires equality of access and price to function democratically, economically, and culturally. It is the nervous system of the nation and cannot be tiered or allocated according to business principles.

Internet deployment in Australia happened amidst what can be characterised as a period of radical marketisation and our current service standard reflects that: it is uneven, unequal, expensive for users, stiflingly asymmetric, and of very poor quality. This is unsatisfactory and will, as the Minister notes, damage Australia's standing in the world over the longer term.

Further, the asymmetric character of all current Australian networks – having much faster download than upload rates – reflects and exacerbates older, failed cultural policies that have made Australia into a net importer of cultural material. Any future national network must recognise the importance of transmission speed and avoid at all costs any proposal that has asymmetric standards at the core. Our distance from the rest of the world dictates that we must be empowered to talk back to the world as fast as we can download its digital content offerings.

**Proposed solutions:** The current proposal to establish a national network of optic fibre is in my estimation a grave and expensive mistake. It will reproduce every problem from the history of fixed telephony in Australia. There will be huge budget overruns, areas that are forever inaccessible to cable, and many important areas that are grossly uneconomical to provide for.

In terms of infrastructure innovation, such a network will render absolutely nothing to the country: it is an old idea whose time has passed and the R&D potentials of a fibre network are practically nil. The network will deteriorate, be expensive to maintain, and

will eventually get overloaded and need replacement. Most of all, cable is outdated technology on the verge of being almost completely superseded.

I think the best possible solution is a national wireless system that uses the 700MHz band which is currently occupied by public television. With the move to digital television, the spectrum will be available by the end of 2008. The evacuation of the 700MHz spectrum provides an historic opportunity to repurpose electromagnetic real estate for a national broadband communication network. It is a nationally significant space to which all Australians currently have access. There are nascent technological innovations designed to taking advantage of the space, and to do so in such a way that any plans to auction the bandwidth to commercial interests can proceed without interference. I am thinking specifically of Google's recent "whitespace" developments which use the spaces in between existing channels to deploy broadband communication networks. If it is absolutely necessary to auction off the 700MHz spectrum for budgetary reasons, the approach I am suggesting would not obviate the process in the least.

Such a network solves many problems related to laying cables. But it also presents many opportunities for R&D that will realise economic benefits as export IP to countries with similar geographical challenges, such as Canada and parts of Eastern Europe, along with emerging giants such as India and China. CSIRO is has cutting edge research programs in antennae technologies that could be greatly advanced with a national testbed. This is important because research in antennae technologies is the "next big thing" for communications technology innovation. Massive research efforts are currently underway in North America (eg, efforts associated with Research In Motion at Waterloo, the makers of Blackberry, and those of Google among many others), though none of these major innovators has the opportunity to deploy and test new wireless technologies on such a massive scale as would be the case if my suggestions here are adopted.

Apart from the obvious savings associated with not having to lay cables throughout our massive country, a national wireless broadband network is an historic R&D opportunity, and not just for antennae research: protocols, routers, and hybrid networks are all areas of innovation that would be greatly hastened by such a network, and to great economic benefit for Australia. There are also a great many programs of research for the arts, social sciences, and humanities that would be spurred by such a network, especially if it were

affordable (ideally free) and accessible for every person in the country. It is something that has never been done on such a scale; is flexible and extensible in a way that fixed cable can never be; is far more easily maintained than cable; and, while it does not rely on R&D outcomes to be set up, the network would provide a platform on which fruitful R&D could be done for years to come in many of the most important areas of innovation, including technology, culture, democracy, and creative industries. It would also be far cheaper to maintain, less susceptible to vandalism, plumbing accidents, plough damage, or weather exposure. It can be constantly upgraded. It is ultimately accessible. The medium itself is eternally renewable as far as we know.

Finally, and perhaps most importantly, a 700MHz national broadband system would be an innovation in itself. It would be something completely new on a national scale. It would uniquely position Australia in communications R&D worldwide and send a message to the world that Australia is, so to speak, seriously back in the telecommunications “game” for the first time since the 1970s.

The cable proposal has none of these advantages. It is an expensive and cumbersome technology without a long term future as public infrastructure.

I hope my advice persuades you to consider abandoning the proposed cable system and adopt a wireless system instead. Wireless is the future of digital telecommunications. Cable is its past.

Please contact me if you require further detail or a more technical submission. I thank the Minister for the opportunity to make a submission on this pressing issue.

Phil Graham, Queensland University of Technology.