

# Digital Inclusion in the Broadband World: Challenges for Australia

By Don Perlgut

Paper presented at the Communications Policy and Research Forum  
Sydney, November 7, 2011

## Introduction

This paper discusses the potentially looming “digital participation gap” in Australia, if concerted efforts are not commenced soon to make certain that poor, remote and vulnerable communities in Australia are not actively included in the fast internet roll-out. The paper:

- examines the NBN Co roll-out timing and assumptions;
- asks the question “why broadband?”;
- analyses the characteristics of “non-adopters” and those at risk of not connecting to broadband internet;
- reviews two pilot “digital inclusion” initiatives (one in Australia and one in the USA); and
- makes a number of recommendations that will enhance digital inclusion efforts in Australia.

Now that Australia’s much-discussed National Broadband Network (NBN) is underway, many people assume that it is just a matter of time before we are all fully connected. The concept of “digital divide” has slipped from the public radar in recent years under the onslaught of smart phones, iPads, other “tablets” and the bewildering and growing collection of digital devices that will operate under the law of “if it can be connected, it probably will”.

Those Australians most at risk of digital exclusion are poor, Indigenous, elderly, disabled or living in rural or remote areas of Australia. The publicity surrounding the development and construction of the NBN has created what I call “the Kevin Costner effect”, named after the film *Field of Dreams*, which Costner starred in.<sup>1</sup> The famous “tag line” of that film is “if you build it, they will come”. However one problem caused by the NBN – which is in fact a visionary piece of public infrastructure the envy of many other countries, despite some internal Australian critics - is that just because you build it, it is certain that a large number will not come. Internet access does and will cost money, and it will take some level of finance, technical expertise and digital literacy to gain and maintain that access. This paper examines these issues.

## Digital Inclusion and Digital Access

Digital inclusion is the ability of individuals and groups to access and use information and communication technologies, and includes:

- access to the Internet;
- availability of hardware and software;
- relevant content and services; and
- training for the digital literacy skills.

To achieve full participation in society – economic, educational, health and civic engagement, digital inclusion will be required.<sup>2</sup>

This paper follows the four assumptions adapted from the University of Washington *Digitally Inclusive Communities Framework*:

1. Broadband is a societal “game-changer”, with profound and long-lasting impacts.
2. Advanced digital technology can and will enable economic & social well-being.
3. Digital inclusiveness is a worthwhile public policy goal to mobilise public and private resources.
4. Digitally inclusive communities require the involvement of all sectors – public and private as well as the “third sector” (philanthropic).<sup>3</sup>

### National Broadband Network Deployment

A careful analysis of the Australian National Broadband (NBN) *Corporate Plan 2011-2013* (15 December 2010) reveals a number of the assumptions of the Australian broadband roll-out. Table 1 below is based on exhibit 6.1 (page 77) of that plan and indicates a nine and a half year deployment schedule with the half-way mark not being reached until approximately January 2017.

**Table 1: Deployment Schedule: NBNCo premises to be connected**

	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
<b>Fibre</b>	35	137	511	1589	2616	3679	4712	5708	6672	7623	8320
<b>Satellite/ Wireless</b>	0	13	55	102	151	165	181	198	215	222	229
<b>Total conncted</b>	35	150	566	1691	2767	3845	4893	5905	6887	7845	8549

Note: all figures in ‘000.

Table 2 below is also taken from the NBN *Corporate Plan* (exhibit 10.2, page 133) and provides detail that allows us to analyse the NBN roll-out assumptions. The “total possible” premises is a combination of both households and businesses and shows how many NBN believes will be connected to the NBN at the end of the roll-out period (FY 2021) and in subsequent years. The NBN “Base Case” assumes approximately 4.6% of premises (0.6 million premises) will be served by non-NBN networks at FY2025 and thus I have adjusted the table to show that.

On the basis of these figures, it appears that the NBN is anticipating a “broadband connected” total of 76.6% of all Australian “premises” in 2025 (see third column, bottom row).

**Table 2: Total uptake estimates – based on NBNCo Corporate Plan; Deployment Schedule: NBNCo premises to be connected**

Premises	FY 2021	FY 2023	FY 2025	FY 2028	FY 2040
<b>Total connected</b>	8,549	9,024	9,311	9,736	11,303
<b>Total possible</b>	12,202	12,568	12,931	13,467	15,435
<b>% NBN connected</b>	70.0%	71.8%	72.0%	72.2%	73.2%
<b>Non-NBN connected</b>	n/a	n/a	600	n/a	n/a
<b>Total connected</b>	n/a	n/a	9,911	n/a	n/a
<b>% total connected</b>	-	-	76.6%	-	-

Table 2 notes:

1. Construction completed in December 2020 (as per Business Plan).
2. Wireless/satellite connections also continue to grow to 2025.
3. Table assumes “total possible” constitutes 100% of all Australian households as this was stated Government intention.

In other words, the NBN Business Plan appears to assume that 23.4% of Australian premises will NOT have broadband in 2025.

It is important to note that current (2011) household broadband connection estimates in Australia vary from approximately 68% (ACMA)<sup>4</sup> to 87% (Swinburne “Internet in Australia” project).

It is possible that I may have missed an NBN qualifying statement somewhere or miscalculated, although I do not think so. But the fact remains that NBN is still calculating on a substantial (possibly greater than 20%) number of Australian premises which will not be broadband-connected in 2025. This is a large number, particularly if it will be concentrated amongst the poor, Indigenous, elderly, and rural and remote locations.

In making this observation, I am not criticising the NBN (nor the Government). What I am pointing out are the what I believe to be the NBN “take-up” assumptions, which are reasonable ones. So, let’s assume that 80% of premises will be connected (rounding upwards). If so, the questions are:

- What about the other 20%?
- Who are they?
- What happens with them?
- What are the implications of their NOT being connected?
- What can and should we be doing now?
- What are realistic goals for that 20%?

These figures are consistent with those presented by the Office of the United Kingdom Digital Champion, which estimates that 8.7 million adults in the UK never use technology, and people who are “offline” over-estimate the costs of being online by a factor of three.<sup>5</sup> They believe that the “addressable market” (by business) in the UK is estimated to be 80% of the population: they will find their own way online. It’s the final 15 to 20% that really need the help, they believe.

I am both an idealist and a realist. My idealism tells me that we must commit to 100% inclusiveness, because if we aim anywhere lower we are running the risk of creating a second class of citizens and whole communities that has the potential to become divorced from social, civic and economic engagement with the rest of Australia (as well as the rest of the world).

## **The Digital Ownership Gap as a Symbol of a Growing Problem**

Here is an example of how this “participation gap” is starting to manifest itself as part of an “ownership gap”, and taking on symbolic meaning. I just spent two months living in New York City, a place that is now one of the safest large cities in the USA.<sup>6</sup> But what is the fastest growing crime in New York City in late 2011, significantly responsible for the seventeen percent increase in subway crime in last year? According to *The New York Times*, it is stealing electronic gadgetry, and particularly iPhones.<sup>7</sup>

The relevance of New York subway crime to the digital divide? As Gina Bellafante writes in *The New York Times* on October 28, 2011:

The poignancy surrounding the current spate of iPhone thefts is that Apple products have always read as cooler than their rivals’ because their design suggests a gleaming world of innovation and opportunity, of capitalism behaving well — a world that seems ever diminishing, ever less accessible to the struggling and young.<sup>8</sup>

The operable words here are “capitalism behaving well”. In other words, in a world where we are struggling to prevent further slippages into less equal distribution of wealth and income (“the richest 1 percent of Americans now take home almost 24 percent of income, up from almost 9 percent in 1976”),<sup>9</sup> the symbols of technology and “connectedness” are becoming the most important ones. Technology access, use and ownership are now becoming one of the great wealth delineators. And we are foolish if we think that this phenomenon – the theft of small and expensive connected electronic devices - will not be replicated here in Australia, if not has not been already.<sup>10</sup>

## **Broadband for What?**

Before we go much further, it is important to ask the question “broadband for what?” The company Sandvine has released a *Global Internet Phenomena Report: Fall 2011*,<sup>11</sup> which includes some fascinating data, including:

- In North America, more “real-time entertainment” bytes (55%) are destined for game consoles, smart TVs, handhelds and mobile devices than to desktop and laptop computers (45%).
- 96% of North American broadband subscribers use “real-time entertainment” every month.
- The online entertainment streaming company Netflix (dominant in North America, and soon to open in the United Kingdom) along with the BitTorrent peer-to-peer network are responsible for a very high percentage of web traffic from North America (and of course, other) countries – see Table 3 below.

**Table 3: Top Applications by Bytes (Peak Period) - North America, Fixed Access**

	Upstream		Downstream		Aggregate	
Rank	Application	Share	Application	Share	Application	Share
1	BitTorrent	47.55%	Netflix	32.69%	Netflix	29.03%
2	HTTP	11.45%	HTTP	17.48%	HTTP	16.59%
3	Netflix	7.69%	YouTube	11.32%	BitTorrent	13.47%
4	Skype	4.27%	BitTorrent	7.62%	YouTube	9.90%
<b>Top 10</b>		<b>82.63%</b>		<b>83.88%</b>		<b>82.83%</b>

Source: Sandvine Global Internet Phenomenon Spotlight – North America – Fixed Access Report, p. 8, Fall 2011.<sup>12</sup>

It is important that any digital inclusion efforts that are directed to increasing participation in the digital world are not just about making the world “safe” for Netflix, or its local equivalents (Quickflix in Australia is due for a major expansion as I write this in November 2011).

## Characteristics of Broadband Adoption

The major access dividing lines for broadband are education, income, age/disability, literacy, location (rural/remote) and – in the USA in particular – race. The following figures are taken from the report *Broadband Adoption and Use in America*, by John Horrigan (Washington, D.C.: Federal Communications Commission Omnibus Broadband Initiative (OBI) Working Paper number 1, February 2010).<sup>13</sup> They are broadly indicative of Australia’s situation as well.

### Education

- 46 percent of adults whose highest level of education is a high school degree are broadband users at home
- 82 percent of adults who have attended or graduated from university are broadband users at home

### Income

- 87 percent of households in USA with incomes above \$50,000 have broadband at home.
- 52 percent of households with incomes of less than \$50,000 have broadband at home.
- 40 percent of households with income below \$20,000 have broadband.

## **Race**

- 75% of whites (compared to 65% of all Americans)
- 59% of African Americans – but 75% of African Americans under age 30 had broadband<sup>14</sup> - a profound difference that means that elderly African-Americans are particularly vulnerable and “disconnected” – less than 21% of them have broadband access.
- 49% of Hispanics
- 20% of Hispanics who primarily speak Spanish at home

## **Age and Disability**

- Only 42% of Americans with disabilities have broadband at home.
- Only 48% of Americans over age 65 are internet users of any sort.
- In Australia, 28 per cent of people with a disability have broadband access compared to 48 per cent of people who do not need assistance.<sup>15</sup>

## **Rural and Remote**

Only 50% of rural USA residents have broadband, due to lack of access, age and poverty (compared to 65% of all Americans). The situation in Australia is not much different. As the NBN website states:

Current data indicates that the number of Australians who have never used the internet is higher among those people living in regional and remote areas. For example, 34 per cent of people from outer regional and remote areas aged 15 and over did not use the internet in 2008-09, compared with only 23 per cent of people in Australia’s major cities. Data indicates that 29.7 per cent of businesses located outside of capital cities have a web presence, compared with 39.5 per cent of business located in capital cities.<sup>16</sup>

A team from Edith Cowan University in Western Australia has studied Internet usage in rural Australia, and concluded:

The take-up of national broadband facilities, particularly in regional and remote areas, is a complex, multi-factorial scenario in which personal and organizational decisions are shaped by physical, cultural, economic and political elements. The vast distances and extremes of climate in the Australian outback provide physical obstacles, the sparse population reduces the economic viability of these services and the community based culture of an aging population resists computer-mediated communication.<sup>17</sup>

## **The Importance of Literacy**

The Australian Bureau of Statistics (ABS) identifies four adult literacy domains: prose, document, numeracy and problem-solving. Of those four, two - prose and document literacy are most closely associated with digital literacy. Some 17% of adult Australians have poor “prose” literacy and 18% poor document literacy – sufficiently poor to impact on daily life. (However only 4% actually recognised these poor skills.) Thus literacy is a key element in preventing full digital participation.<sup>18</sup>

## Broadband and Indigenous Australians

The recently completed review of *Review of Australian Government Investment in the Indigenous Broadcasting and Media Sector* (the “Stevens report”) confirmed the vitality, professionalism and accomplishments of the Indigenous media and broadcasting sector, although described it as “still under-developed”.<sup>19</sup> There is no doubt that Indigenous Australians are accomplished producers and consumers of television, radio and other electronic media. As early as 1997, a research study by David Nathan recognised that “Indigenous participation in the early growth of the World Wide Web was vigorous and successful”.<sup>20</sup>

My own experiences with Indigenous media<sup>21</sup> showed that Indigenous capabilities to participate in Australian media production have been historically under-utilised. Research presented at the CPRF conference by Swinburne University researchers does indicate, however, that only a fraction of remote Indigenous Australians use the internet, much less have access to broadband.<sup>22</sup>

I do believe that a large number of Indigenous Australians will embrace broadband as the successful communications tool that it is, although they will be held back by similar factors to the rest of “non-adopters”, particularly digital literacy and cost. Both of these are significant: as we know, Indigenous Australians on average are amongst the poorest of Australians, and low educational attainment and literacy.

As the Indigenous Literacy Foundation reports:

- There is an enormous gap in the English literacy rates of Indigenous and non-Indigenous people in Australia. The gap is even wider for Indigenous people living in remote and isolated communities.
- The gap between Indigenous and non-Indigenous students emerges early. In the Northern Territory by Year 7, just 15% achieved expected standards, 47 percentage points behind their metropolitan-based Indigenous peers and 74 percent less than non-Indigenous students.
- Nutrition and health are closely connected to educational achievement and literacy skills. The health status of Australia’s Indigenous population is poor by world standards, with life expectancies up to twelve years lower than non-Indigenous Australians, and health equivalent to the population of Bangladesh.<sup>23</sup>

## Non-Adoption of Broadband

According to the Horrigan report for the FCC (2010),<sup>24</sup> there are three reasons for not adopting broadband in the USA:

1. 36% cite cost (15% monthly bill too high; 10% cost of computer; 9% do not want long-term service contract or cost of installation; 2% combination of factors);
2. 22% lack of digital literacy (they are worried about the bad things) – and tend to be older; and

3. 19% say broadband is not relevant to their lives.

Non-adopting Americans fall into four categories:

- “digitally distant” (10%) see no point in being online;
- “digital hopefuls” (8%) want to be online but lack resources and/or comfort;
- “digitally uncomfortable” (7%) have resources but lack skills and interest; and
- “near converts” (10%) want to be online and already have dial-up access, are younger but worried about the monthly cost.

These four categories are important because different strategies will be required for those falling into different segments.

## Digital Inclusion Efforts

A large number of digital inclusion efforts have been undertaken in the USA. The *National Broadband Plan* (of the Federal Communications Commission) outlines a crucial policy framework for them.<sup>25</sup>

The major US funding for digital inclusion efforts: Broadband Technology Opportunities Program (BTOP), set up through the American Recovery and Reinvestment Act of 2009, and managed by the National Telecommunications and Information Administration (NTIA). The Recovery Act provided NTIA with \$4.7 billion to establish BTOP. Extensive activities also taking place through the Department of Agriculture, the Federal Communications Commission (FCC), and a wide range of philanthropic and non-profit organisations.<sup>26</sup>

A fascinating project which I visited in New York City is the Digital Divide Partnership, an African-American owned operation which involves the setting up of free wireless internet in very poor minority parts of New York City in The Bronx, Harlem (Manhattan) and parts of Brooklyn in what is described as “the single largest underserved community in the nation consisting of 650,000 residents of New York City Housing Authority and Section 8 developments”.<sup>27</sup> They have further applied it to some very basic needs: using the internet to give residents of public housing estates (in the New York City Housing Authority) visibility over their estates, an issue which was very much “in vogue” in the 1970s with Oscar Newman’s “Defensible Space” concept.<sup>28</sup> Funding comes from the State of New York and the non-profit technology funder One Economy Corporation.<sup>29</sup>

A number of Australian digital inclusion efforts have been established and are being operated by the Australian Government Department of Broadband, Communications and the Digital Economy:

- Digital Communities Initiative - \$23.8 million for ‘Digital Hubs’ in the 40 communities that will first benefit from NBN.
- Broadband for Seniors - \$15 million, 2000 kiosks, 160,000 seniors served.
- Digital Local Govt program - 40 sites x \$375,000 each to first 40 NBN communities.
- Digital Enterprise Initiative - \$12.4 million for small-to-medium enterprises and not-for-profits organisations to benefit from the NBN.

A most unique – and highly successful series of digital inclusion efforts have been undertaken by the Melbourne non-profit organisation Infoxchange.<sup>30</sup> This organisation has undertaken the largest pilot inclusion efforts in Australia – and has evaluated them. An evaluation report undertaken by A.T. Kearney<sup>31</sup> concluded \$5.9M in benefits from digital inclusion initiative projects, including:

- education and employment (\$4.1 million) - education, language & IT skills, job search;
- communication and connectivity (\$1.3 million) - discounted internet access & alternatives to traditional telephone communications;
- transactional efficiencies (\$0.2 million) – government & financial services; and
- health and wellbeing (\$0.3 million) - access to online resources & support networks.

## Conclusions

- Within five years, digital exclusion will rival all other social and economic determinants, and may become the major social justice challenge of our time.
- Digital inclusion cannot be separated from economic and social inclusion, and will become a major factor in assisting (or losing) social and economic justice.
- In the digital world, place still matters – rural/remote as well as locational access to education, health and economic opportunity.
- As identified at the beginning of this paper, Indigenous peoples, under-educated, poor, elderly, disabled, rural and remote residents are all uniquely vulnerable.
- We need to shift the household broadband adoption focus from entertainment consumption to economic production.
- A “whole of society” effort required for proper inclusion – simply putting it all on “government” is not the answer.

## Recommendations

- Comprehensive research into broadband adoption in Australia is needed, including the characteristics of non-adopters and the barriers to adoption.
- Consideration of low-cost, subsidised broadband wireless networks in parts of Sydney, Melbourne and other large cities with concentrations of poorer-residents.
- We also need to consider a fully subsidised broadband service for everyone over age 65, as that group is particularly vulnerable, and there are already precedents and systems in place.
- Comprehensive digital inclusion plan is needed that will parallel and complement the NBN roll-out and incorporate current DBCDE efforts.
- Proper metrics for digital inclusion efforts are needed. Not just numbers, but economic and social development, impact on health, education and welfare and “social capital”.
- It is important to identify one national government organisation with responsibility for promoting digital inclusion – at this point, I vote for ACMA, as it has an “outward-facing” capability and is already operating in the area.

- National efforts can only be successful with on-the-ground activities provided by and through local government, which has not yet been fully engaged by digital participation efforts.

## Additional references

Bell, Dr Genevieve, *Getting Connected, Staying Connected*, 2009.  
[www.thinkers.sa.gov.au/lib/pdf/GB15.pdf](http://www.thinkers.sa.gov.au/lib/pdf/GB15.pdf).

Deloitte Access Economics, *The Connected Continent? How the internet is transforming the Australian economy*. See [www.connectedcontinent.com.au](http://www.connectedcontinent.com.au)

## Contact details

Don Perlgut  
PO Box 155  
Roseville NSW 2069 Australia  
Email: [don.perlgut@gmail.com](mailto:don.perlgut@gmail.com)  
Web: [www.donperlgut.com](http://www.donperlgut.com)

## Notes follow:

---

<sup>1</sup> *Field of Dreams* was released in 1989, directed by Phil Alden Robinson and adapted by Robinson from the W.P. Kinsella book (1985) entitled *Shoeless Joe*. See <http://www.imdb.com/title/tt0097351/> and <http://www.amazon.com/Shoeless-Joe-W-P-Kinsella/dp/0395957737>.

<sup>2</sup> Taken from the *Proposed Framework for Digitally Inclusive Communities*, the Institute of Museum and Library Services, University of Washington and the International City/County Management Association. <http://www.imls.gov/assets/1/AssetManager/DIC-FrameworkReport.pdf>

<sup>3</sup> Ibid.

<sup>4</sup> Presentation by Joseph di Gregorio, Manager, Communications Analysis, Australian Communications and Media Authority, presentation at the CPRF, November 8, 2011. Presentation by Scott Ewing and Julian Thomas, Institute for Social Research, Swinburne University, CPRF, November 8, 2011.

<sup>5</sup> See <http://raceonline2012.org/>

<sup>6</sup> [http://www.forbes.com/2010/10/11/safest-cities-america-crime-accidents-lifestyle-real-estate-danger\\_2.html](http://www.forbes.com/2010/10/11/safest-cities-america-crime-accidents-lifestyle-real-estate-danger_2.html)

<sup>7</sup> See “Thefts of Electronic Devices on Subways Rise”, by Christine Haughney, *New York Times*, September 26, 2011.

---

<http://www.nytimes.com/2011/09/27/nyregion/thefts-of-ipads-and-iphones-drive-up-subway-crime-in-new-york.html>

<sup>8</sup> See “Easy to Use, or Steal, but Inching Out of Reach”, by Gina Bellafante, *New York Times*, October 28, 2011. <http://www.nytimes.com/2011/10/30/nyregion/easy-to-use-or-steal-iphone-inches-out-of-reach.html>.

<sup>9</sup> Nicholas D. Kristof, “Our Banana Republic”, *The New York Times*, November 6, 2010. <http://www.nytimes.com/2010/11/07/opinion/07kristof.html>. Also see Timothy Noah, “The United States of Inequality”, *Slate*, September 3, 2010. [http://www.slate.com/articles/news\\_and\\_politics/the\\_great\\_divergence/features/2010/the\\_unit\\_ed\\_states\\_of\\_inequality/introducing\\_the\\_great\\_divergence.html](http://www.slate.com/articles/news_and_politics/the_great_divergence/features/2010/the_unit_ed_states_of_inequality/introducing_the_great_divergence.html).

<sup>10</sup> For a number of reasons, wealth and income inequality is not as bad (or as obvious) in Australia as it is in the USA, however it is still present and will be exacerbated by a growing digital participation gap. See “The Distribution of Wealth in Australia” by Frank Stilwell and David Primrose, <http://www.evatt.org.au/papers/distribution-wealth-australia.html>. Also see “Australians want greater equality in wealth share”, by Peter Martin, *The Sydney Morning Herald*, August 29, 2011. <http://www.smh.com.au/business/australians-want-greater-equality-in-wealth-share-20110828-1jgn6.html>.

<sup>11</sup> To view the Sandvine report, go to [http://www.sandvine.com/downloads/documents/10-26-2011\\_phenomena/Sandvine%20Global%20Internet%20Phenomena%20Report%20-%20Fall%202011.pdf](http://www.sandvine.com/downloads/documents/10-26-2011_phenomena/Sandvine%20Global%20Internet%20Phenomena%20Report%20-%20Fall%202011.pdf)

<sup>12</sup> Adapted from [www.sandvine.com/downloads/documents/10-26-2011\\_phenomena/Sandvine%20Global%20Internet%20Phenomena%20Spotlight%20-%20North%20America%20-%20Fixed%20Access%20-%20Fall%202011.pdf](http://www.sandvine.com/downloads/documents/10-26-2011_phenomena/Sandvine%20Global%20Internet%20Phenomena%20Spotlight%20-%20North%20America%20-%20Fixed%20Access%20-%20Fall%202011.pdf).

<sup>13</sup> Available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-296442A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf).

<sup>14</sup> Also see *Designing Broadband Adoption Policies to Enhance African American Competitiveness in the Job Market – Linking Policy Solutions with Local Services*, by Madura Wijewardena, Chanelle Hardy and Valerie Wilson. Washington, DC: National Urban League Policy Institute, October 2011. Also see *Place Really Matter? Broadband Availability, Race and Income*. JC MTI Working Paper – 01 by Ying Li, Nicol Turner-Lee, Samir Gambhir and Mikyung Baek. Washington, DC: Joint Center for Political and Economic Studies, April 2011.

<sup>15</sup> See <http://www.nbn.gov.au/for-households/where-are-we-now/>.

<sup>16</sup> See <http://www.nbn.gov.au/regional-australia/>.

<sup>17</sup> From the report *Examining Rural Adoption of Broadband – Critical Realist Perspectives*, by Philip Dobson, Paul Jackson and Denise Gengatharen, Edith Cowan University, 2011. Available at <http://www.pacis-net.org/file/2011/PACIS2011-046.pdf>.

---

<sup>18</sup> Source:

<http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4228.0Main%20Features22006%20%28Reissue%29?opendocument&tabname=Summary&prodno=4228.0&issue=2006%20%28Reissue%29&num=&view=>.

A good summary of digital literacy is contained in a February 2010 paper by Lesley Osbourne (ACMA): go to

[http://www.acma.gov.au/webwr/\\_assets/main/lib310665/digital%20communications%20literacy%20iic%20qatar.pdf](http://www.acma.gov.au/webwr/_assets/main/lib310665/digital%20communications%20literacy%20iic%20qatar.pdf).

<sup>19</sup> Neville Stevens AO, *Review of Australian Government Investment in the Indigenous Broadcasting and Media Sector*. Canberra: Department of Broadband, Communications and the Digital Economy.

<sup>20</sup> David Nathan, "Indigenous people in an interconnected world", Paper presented at the Fulbright Symposium, Darwin, July 1997. Published as "Plugging in Indigenous knowledge - connections and innovations". In *Australian Aboriginal Studies* 2000:2, pp 39-47. See <http://sydney.edu.au/engineering/it/~djn/papers/plugging.htm>.

<sup>21</sup> This experience includes assisting in setting up an Aboriginal employment and training program and Indigenous Programs Unit with ABC TV in 1987 to 1989, and Indigenous community TV health activities with the Rural Health Education Foundation, 2003-2011.

<sup>22</sup> See [http://www.sisr.net/Flagships/communications/projects/Home\\_Inter.html](http://www.sisr.net/Flagships/communications/projects/Home_Inter.html) and the Australian Communications Consumer Action Network report on *Home Internet for Remote Indigenous Communities* (July 2010) located at [http://accan.org.au/index.php?option=com\\_content&view=article&id=345:home-internet-for-remote-indigenous-communities&catid=96:broadband&Itemid=208](http://accan.org.au/index.php?option=com_content&view=article&id=345:home-internet-for-remote-indigenous-communities&catid=96:broadband&Itemid=208)

An older (2005) paper entitled "Indigenous Australians and the 'digital divide'" by Katrina Samaras is available at <http://www.librijournal.org/pdf/2005-2-3pp84-95.pdf> also provides important detail.

<sup>23</sup> Sources: <http://www.indigenouliteracyfoundation.org.au/About/IndigenousLiteracy> and <http://www.healthinfonet.ecu.edu.au/health-facts/overviews/mortality>.

<sup>24</sup> Available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-296442A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-296442A1.pdf).

<sup>25</sup> See <http://www.broadband.gov/>.

<sup>26</sup> See the following North American organisations involved in digital inclusion efforts: Aspen Institute (<http://www.aspeninstitute.org/>), the Joint Center for Political and Economic Studies (<http://www.jointcenter.org/>), One Economy Corporation (<http://www.one-economy.com/>), the National Urban League (<http://www.nul.org/>), the Knight Foundation (<http://www.knightfoundation.org/about/>) and the New America Foundation (<http://newamerica.net/>). Also see the work undertaken by the Intelligent Community Forum in relation to digital inclusion and economic development ([www.intelligentcommunity.org](http://www.intelligentcommunity.org)).

<sup>27</sup> See <http://ddpusa.org/> for more details about the Digital Divide Partnership.

---

<sup>28</sup> See <http://www.huduser.org/portal/publications/pubasst/defensib.html>. I also completed my Masters degree thesis on a similar topic (calling it “Manageable Space”) at the University of California at Berkeley. See <http://www.safercommunity.org.nz/Articles/tabid/856/ID/184/Crime-Prevention-Through-Environmental-Design.aspx>, <http://www.criminologyresearchcouncil.gov.au/reports/9-83.pdf> and <http://catalogue.nla.gov.au/Record/875671>.

<sup>29</sup> See <http://www.one-economy.com/>.

<sup>30</sup> See <http://www.digitalinclusion.net.au/>.

<sup>31</sup> The A.T Kearney report (and other evaluation reports) can be accessed from the Infoxchange digital inclusion website at <http://www.digitalinclusion.net.au/reports>.