AFFORDABLE BROADBAND FOR ALL AUSTRALIANS

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This paper focuses on the issue of broadband affordability for residential consumers in Australia, specifically those 20% of households with very low income. Using new survey data with analyses of market prices, customer segments and the relative prices and capabilities of fixed and wireless broadband, the paper argues that affordability is still a significant issue that needs to be discussed more openly in the public policy domain. Specifically, policies and programs that enable people on a low income to experience high capacity broadband services for themselves at home would help secure the considerable investment in the National Broadband Network and ensure that the benefits of the growing digital economy are equitably distributed to all Australians.

INTRODUCTION

Making the most of the benefits of the developing digital economy requires a high level of digital inclusion among Australian residents. The roll out of the National Broadband Network (NBN) is central to the Australian Government's expectations of increased digital participation and productivity (Department of Broadband Communications and the Digital Economy 2011b). An enduring issue surrounding the NBN has been the lack of a rigorous cost-benefit analysis, which has led to ongoing debates about the magnitude of the prospective cost of the new fibre-to-the-premises (FTTP) network and the implications for pricing and affordability of services for end users. Affordability is currently a hot political potato as the following parliamentary debate shows.

> *Why spend $50 billion on a national broadband network just so customers can subsequently spend almost three times their current monthly fee on speeds they might not need? Why dig up every street when fibre to the node could more swiftly and more affordably deliver 21ˢᵗ century broadband* (Abbott 2012)?

And in reply:

> *Mr Abbott told Parliament that the cost to consumers of NBN services could be three times higher than what they currently pay. That is just wrong. Prices for NBN plans released to date are cheaper than, or equivalent to, existing ADSL plans, but with much improved quality of service… Thanks to the NBN, competition between retail providers is increasing* (Conroy 2012b).

Participation in the digital economy requires a wide range of enablers, including the availability, affordability, accessibility, safety, security, capability and usefulness of the broadband services, and the income, education, skills and engagement of users. These can all make the difference between digital inclusion and exclusion. I have previously focussed on the NBN and people with disability (Morsillo 2011), and now examine in more detail the issue of affordability for low-income residential consumers.

To reiterate, affordability has featured from the very beginning in the Australian Government's general announcements about the NBN: "…every house, school and business in Australia will get access to affordable fast broadband" (Conroy 2009). The *NBN Implementation Study* specifically recommended that "Wholesale prices for NBN services should be set to meet the goals of affordability and take-up" (McKinsey & Company; KPMG 2010, 32) and suggested this could be achieved through the provision of an entry-level plan. The Government's *Statement of Expectations* for the NBN explicitly mentions the need for "maintaining affordability to drive take-up rates" (Wong and Conroy 2010, 10) and, indeed, the *NBN Co Business Case Summary* makes provision for a basic 12Mbps/ 1Mbps "entry-level" service across all delivery platforms: fibre, terrestrial wireless and satellite (NBN Co Limited 2010b).

While the NBN has its "champions" (DBCDE 2011a), including Graeme Innes from the Australian Human Rights Commission as accessibility champion, there is no affordability champion other than the Minister himself who appears to be relying solely on increased competition among retail service providers (RSP) to ensure such an outcome.

This paper will show that digital exclusion at the household level is real today in Australia and significantly correlated with lower incomes. While the NBN will in principle resolve the availability issue, it remains to be seen whether increased retail competition in and of itself will overcome affordability barriers for low-income households who may have to resort to less capable wireless options instead. This calls for a much more considered policy discussion about affordability by Government, industry, researchers and community stakeholders.

## CURRENT HOME BROADBAND TAKE-UP IN AUSTRALIA

This paper focuses primarily on residential broadband access as opposed to Internet access generally. Home broadband access is taken to mean fixed access to a DSL (Digital Subscriber Line), HFC (Hybrid Fibre-Coaxial) cable or fibre-optic based high capacity broadband connection (such as with the NBN). Internet access generally may be achieved through a variety of technologies such as dial-up, mobile and wireless connections, or public access by way of a WiFi hot-spot, web kiosk or public library facility.

The most recent Australian Bureau of Statistics (ABS) *Household Use of Information Technology, Australia* survey reports that 79% of households had home Internet access in 2010-11 (Australian Bureau of Statistics (ABS) 2011). The ABS also reports that broadband is accessed by nearly three-quarters (73%) of all households in Australia (i.e. 92% of households with Internet access). However, this still leaves some 1 796 000 households without Internet access and 2 309 000 households not using broadband access, which are very significant numbers (see also Middleton 2010).

Taking a look at industry statistics, drawn from those who supply Internet services, the most recent ABS *Internet Activity, Australia* report indicates that at 30 June 2012 there were 12 million Internet access subscriptions in Australia, with over 96% of connections being considered broadband. While decreasing in usage, this still equates to some 439 000 subscribers still using dial-up (Australian Bureau of Statistics (ABS) 2012).

THE LINK BETWEEN TAKE-UP, INCOME AND AFFORDABILITY

The ABS specifically comments that "Home Internet access is more common in households with higher incomes. The proportion of households in the highest income quintile with Internet access was 95%, compared with 55% for households in the lowest income quintile" (Australian Bureau of Statistics (ABS) 2011). Figure 1 shows households with home Internet access by relative income since 2004. While significant increases have occurred for those households in the lowest income quintile, they are still a long way behind those on higher incomes.
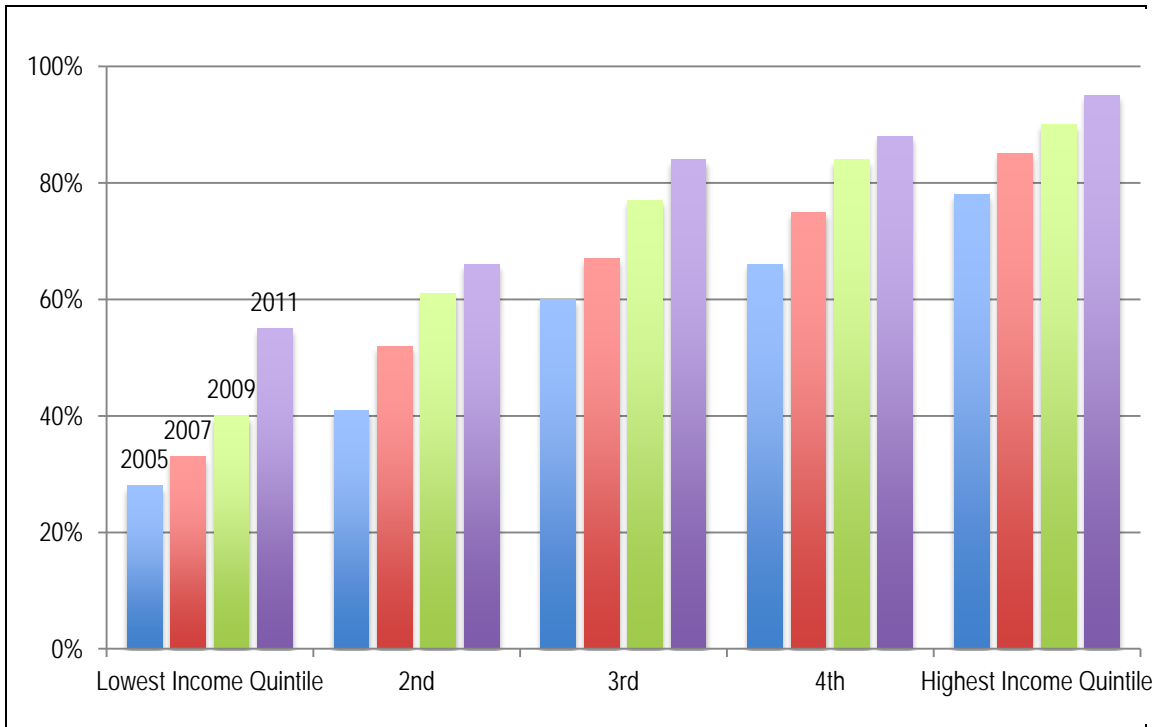
Figure 1 - Proportion of Australian households with home Internet access by household income
(Source: Australian Bureau of Statistics, 8146.0 - Household Use of Information Technology)

The most recent World Internet Project Australian survey included a question about perceived affordability. Of those who had the Internet at home 62% regarded it affordable or very affordable, while 12% regarded it unaffordable or very unaffordable (See Figure 2) (Ewing; Thomas 2011). The significance of this result is that even 12% of people who currently do have the Internet at home report that willingness to pay is a stretch for them.
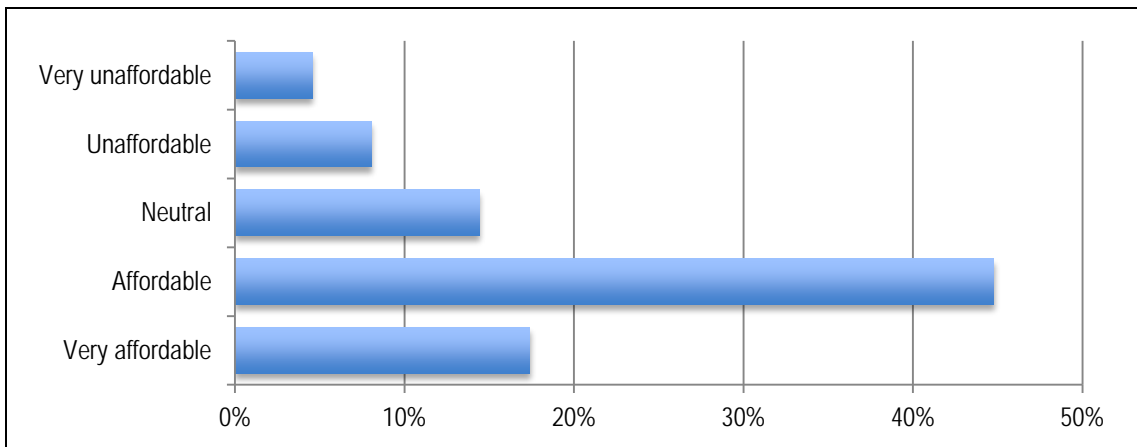
Figure 2 - Perceptions of Internet affordability
(Source: World Internet Project Australian Survey 2011)

Poverty and Exclusion in Modern Australia (PEMA) surveys have been carried out in 2006 and 2010 by the Social Policy Research Centre, University of NSW, rating what Australian's regard as the "essentials of life" (Saunders et al 2007). These include such items as "medical treatment if needed", "a substantial meal at least once per day" as well as "a telephone" and "Internet access at home".

Most "essential" items were rated similarly from 2006 to 2010 except for Internet access at home, home computer and mobile phone, which all rated significantly higher in 2010, and the telephone, which rated much lower in 2010 (Saunders and Wong 2012). Figure 3 graphs these differences between 2006 and 2010.
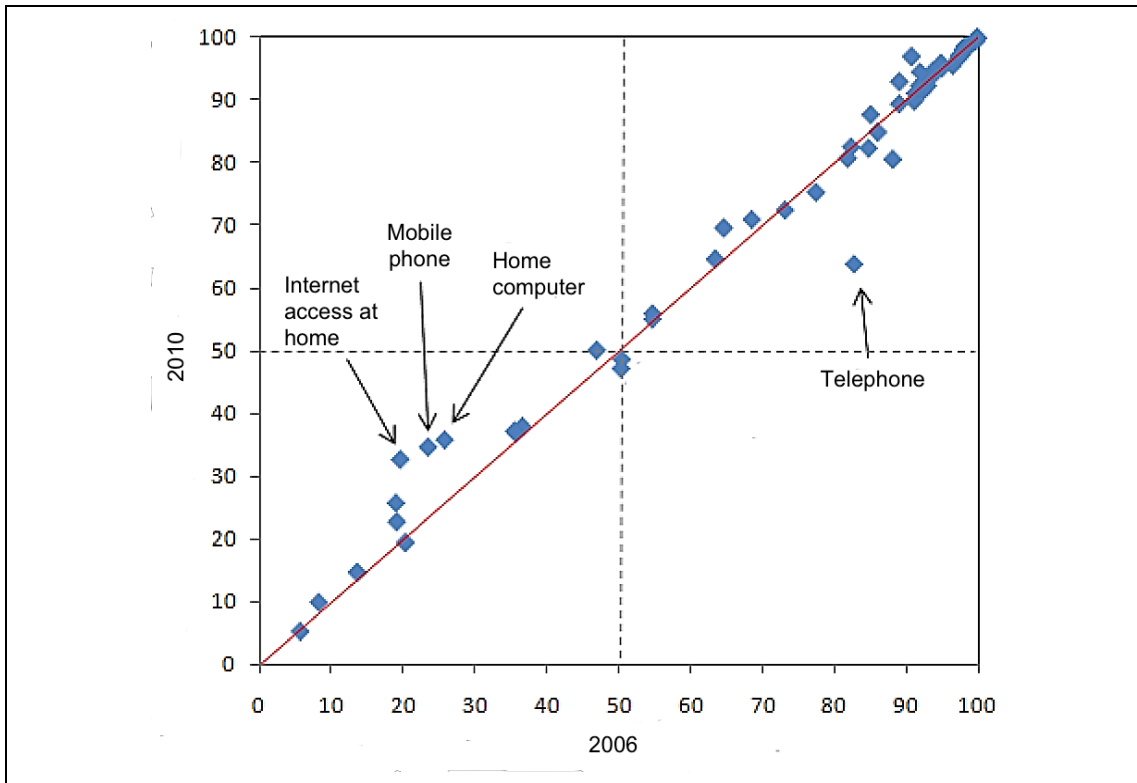
Figure 3 - Comparison of "essentialness" 2006 and 2010 for selected items
(Source: Used with permission, Material Deprivation in Australia, Saunders & Wong, 2012)

The perceived decline in the importance of the telephone (home phone) is consistent with decreasing take-up figures: "During 2010–11, the proportion of Australia's adult population with a fixed-line home telephone declined by three percentage points, to be 81 per cent of adult consumers at June 2011", which was down from 89 per cent in June 2008 (Australian Communications and Media Authority 2011, 7).

As well as rating essential items, the surveys also assess levels of access to, or deprivation of, these essential items. Table 1, extracted from the 2010 PEMA survey, gives deprivation results for Internet at home, mobile phone and telephone based on income source.

	All	Age Pension	Disability Support Pension	Parenting Payment	Newstart Allowance
No Internet at home	5.6%	12.5%	24.5%	26.3%	22.2%
Mobile phone	2.4%	8.1%	16.7%	5.3%	0.0%
Telephone	2.9%	0.4%	14.6%	21.1%	17.7%

Table 1 – Home Internet, mobile phone and telephone deprivation by income source
(Source: Poverty and Exclusion in Australia 2010)

So, while Internet access at home is seen as even more essential these days by the Australian community in general, the indicative levels of deprivation among low-income households dependent on Government income support is cause for concern. One acute example of lack of access is among remote Indigenous communities: "In central Australia… Indigenous households are 76 per cent less likely to have Internet access than non-Indigenous metropolitan households" (Rennie et al. 2011, 9).

In conclusion, there is still a very significant number of households in Australia who do not have a home Internet connection (21% or 1 796 000 households), or who are not using broadband (27% or 2 309 000 households) including some 439 000 dial-up users at last count. This level is much greater among certain consumer segments, for example, Indigenous Australians living in remote areas, people with disability, seniors, and single parent families. There is still a primary link between income and home Internet connections and this will have implications for the utilisation of the NBN by people on a low income. While other factors may also be relevant – such as digital literacy – affordability is key because it is inextricably dependent on pricing.

THE NBN AND FIXED BROADBAND AFFORDABILITY

As already noted, this is a contentious, politically charged issue at the present time. Given the NBN is a new infrastructure build with significant new capital investment it is natural to think that underlying costs (on a commercial basis) will necessarily be higher than for the legacy sunk-cost/ depreciated and heavily regulated copper network that Telstra has been incrementally extending and maintaining for over a hundred years. Because it is a new monopoly network as well there is the prospect of upward pressure on prices.

> *A monopoly network owner will still want to charge a monopoly price for network access. This will inevitably create a conflict between the NBN earning a 'commercial' return and providing affordable broadband access to Australians. Of course, it is far from obvious that the NBN should earn a commercial return. Once the NBN is constructed, marginal cost pricing will maximise economic benefits. However, as the NBN is likely to have average costs well above marginal costs, at least until it reaches capacity, marginal cost pricing for wholesale access to the NBN will not cover capital costs or lead to a commercial return* (Gans and King 2010).

These sentiments were also articulated by Malcolm Turnbull (Shadow Minister for Communications) in response to an interview question.

> **TJA**: *What do you think of the current review of the Universal Service Obligation (USO). Do you have a position on that?*

> **Turnbull**: *Well, basically, nobody is suggesting there should not be universal access to affordable broadband as well as voice, so the question then is: how do you define broadband and what is affordable? One of the concerns I have about the NBN is that because of what I believe is a massive overcapitalisation, and coupled with making it a government monopoly, that is inevitably going to put upward pressure on prices. It's no different from any other business: if you spend too much on your capital, you're going to have to try and recover that. Now if you're a monopolist it's easy to do that if you don't have competitors* (Fell 2011).

However, to some extent these underlying pressures have been addressed in at least three ways. First, by only requiring a modest return on the capital invested by government, versus a much higher return (perhaps double) required by private investors. The expected return is based on the five year Government bond rate, currently around 5%-6% per annum. NBN Co estimates it will generate an Internal Rate of Return of above 7%. In other words, just a little higher than the policy requirement (NBN Co Limited 2012, 71).

Second, the NBN based input costs for RSPs have been mitigated to some extent through NBN Co offering an entry-level wholesale broadband service at a price that will allow retail offers comparable to those currently in the market. Malone (CEO of iiNet) offers the view that this was a reverse-engineered outcome:

TJA: Are you happy with the NBN's pricing model?

Malone: Yes. The NBN appears to have back-sold the pricing to match our existing cost. Now it may be much more complex than that, but the reason, I think, is that one of the policy objectives of the NBN is that there can't be upward pressure on pricing in the retail market. That's a Government mandate: they didn't want to see the NBN cause prices to go up. I think one of the things they've done is to go back and see what the costs are of iiNet, Optus, and TPG for their existing customers on their own networks, because the pricing comes in so suspiciously close that it seems a wild coincidence otherwise (Fell 2012)!

With its virtual monopoly access position, and therefore almost 100% market share, NBN Co is in a position to potentially cross-subsidise such an entry level service assuming there is reasonable take-up of higher-level, higher-price services. Initial indications are that this higher-level take-up is being achieved with Telsyte (2012) reporting that "85 per [cent of] survey respondents had a desire to connect to the Internet at 50 mbps and higher". Quigley (2012b), CEO of NBN Co, has reported to Senate Estimates:

Overall, 38 per cent of active services on our fibre network have been on the fastest speed tier, which is 100 Megabits per second down and 40 Megabits per second up. Only 16 per cent of the active services on our fibre network are for the entry-level speed tier of 12 Megabits down and 1 Megabit up. In the data for April this trend is even stronger, with almost 50 per cent of new active services being on the highest speed tier of 100 Megabits.

However, Quigley (2012a) had also revealed that so far only 25% or so of potential NBN connections are actually being activated. While it is still early days, such take-up rates are not dissimilar to overseas experiences with fibre-based broadband services. For example, in Europe the average take-up rate at the end of December 2011 was 18.4%, which was a *decrease* on the year before (IDATE 2012). Asia-Pacific average take-up rates are higher at around 33% at the end of 2011 (FTTH Council Asia Pacific 2012). Hence, there may be a considerable marketing challenge to achieve the hoped for 70% Australian take-up rate in the original NBN Co *Corporate Plan* (NBN Co Limited 2010a, 116) so that prices can remain as low as possible and hopefully trend towards a marginal cost basis as quickly as possible. Interestingly, the second NBN Co *Corporate Plan* now proposes a move to a "Build Drop" model of connecting premises rather than "Demand Drop", effectively moving from an opt-in connection to an opt-out model, perhaps signifying some concern over the way activation demand is lagging supply of NBN infrastructure (NBN Co Limited 2012, 45).

Third, it is expected there will be substantial and effective competition between RSPs utilising the common NBN infrastructure that will put downward pressure on prices. Certainly, this is Conroy's consistent position: "Thanks to the NBN, competition between retail providers is increasing" (Conroy 2012b) and "Critics of the NBN who have run scare campaigns that the NBN would be unaffordable are being shown to be plain wrong" (Conroy 2011).

On the other hand, business size and market share will become more important for commercial success as the home broadband market matures. Industry consolidation is likely, perhaps resulting eventually in a handful of larger RSPs. Indeed, this process has begun already with the move from dial-up to broadband: "Small ISPs are a dying breed, as many as 200 having disappeared last year, as fixed-line broadband reaches saturation levels (Colley 2011). Malone gives a strong view that RSPs will need to "get big or get out … The top four now are about 88 per cent market share. A lot of people put this down to bulking up ahead of the NBN" (quoted by Fell 2012). ABS figures confirm this with continuing decreases in the number of medium and large size ISPs and a growing market share of the 10 or so very large ISPs (cf. Subscribers by ISP Size, Australian Bureau of Statistics (ABS) 2012).

INITIAL PRICING OFFERS BY NBN RETAILERS

A sample of entry level plans announced by fourteen retail service providers offering services over the NBN shows a range from $29.95 per month to $72.90 per month (see Table 2, left columns).

Entry-level plans over NBN		Entry-level naked DSL plans	
Pre-paid GBytes (peak times)	Monthly Charge	Pre-paid GBytes (peak times)	Monthly Charge
5	$29.95	20	$39.95
10	$35.00	10	$49.90
50	$35.00	20	$49.95
10	$39.95	25	$49.99
10	$39.95	7	$54.95
10	$39.95	25	$59.00
10	$39.95	30	$59.95
30	$49.95	5	$59.95
20	$49.95	50	$59.99
10	$49.95	50	$69.95
20	$49.95		
20	$59.90*		
50	$59.99		
50	$72.90*		
	* Includes mandatory phone service		

Table 2 - Sample of NBN RSP entry-level broadband plans and Naked ADSL2+ plans sorted by monthly charge (Source: whirlpool.net.au and RSP web sites. Note: NBN and DSL samples are not necessarily the same RSPs.)

In general, the monthly price correlates closely with the monthly data allowance. What is interesting is that NBN entry-level offers appear to be priced approximately $10 per month less than Naked ADSL2+ offers but with much less data included (compare Table 2, right columns). Once you get to a more useful 10GB to 20GB per month allowance then the plans start to become quite comparable at around $40-$50 per month (cf. comparisons in NBN Co Limited 2012, 58-59). Of course, depending on the distance from the exchange, a customer on an NBN entry-level service may see an increase or decrease in speed compared to their copper-based service.

The implication of this comparability of plans at the entry level may be that the NBN will not provide a significant price-data allowance improvement to currently available offers and thus not improve broadband take-up among low income users. Further, as already described, there are still some 439 000 subscribers on dial-up Internet connections, which are at very cheap prices (e.g. $9.95 per month, or $32.90 per month including the telephone line) and suitable for email and basic web searching. Encouraging these users to migrate to a much higher minimum service level and price, with the benefit of access to interactive multimedia content, is something that perhaps needs attention.
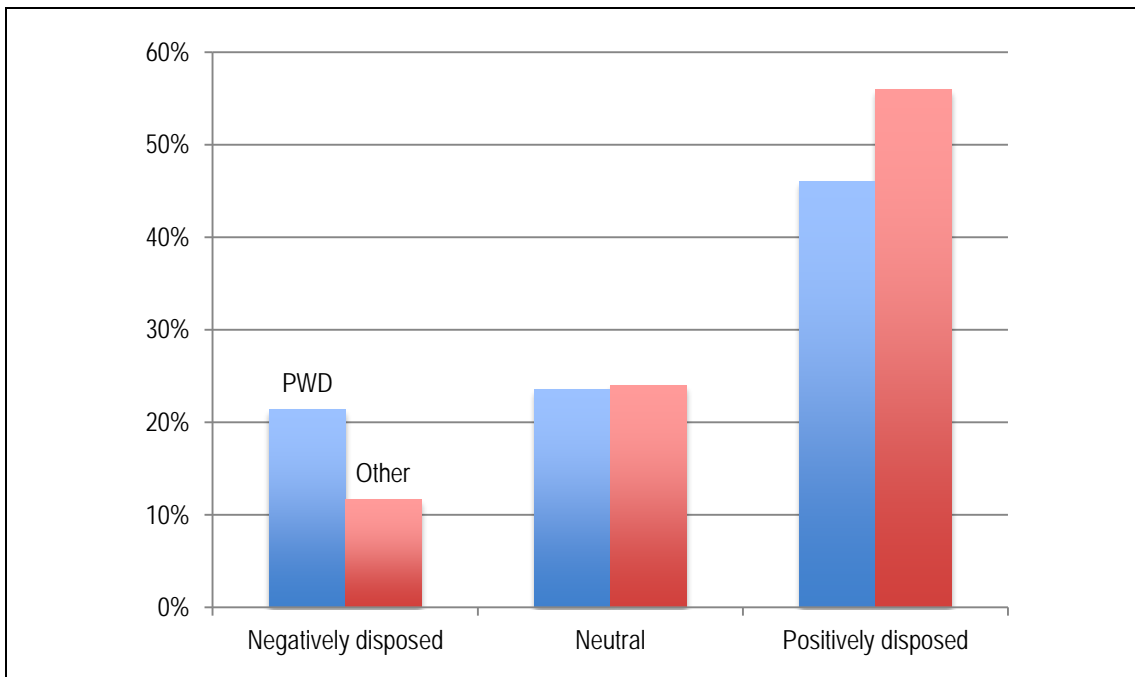
INTENTIONS TO CONNECT TO THE NBN

The World Internet Project Australian survey 2011 also asked people whether they would be connecting to the NBN when it becomes available in their street. Interestingly, of those who are already connected to the Internet at home, the results show no correlation between current affordability perceptions and an intention to connect to the NBN. The majority of respondents (around 55%) were positively disposed towards connecting to the NBN no matter what their view about the affordability of their current Internet service. Unsurprisingly, of those who thought their current Internet service was unaffordable, a greater proportion were negatively disposed to connecting to the NBN (18%).

	Negatively disposed	Neutral	Positively disposed
Affordable	12.6%	24.3%	54.8%
Neutral	11.8%	24.4%	55.1%
Unaffordable	18.0%	17.1%	57.7%

Table 3 - Intention to connect to the NBN by perceived affordability of the Internet
(Source: World Internet Project Australian Survey 2011)

The results from the same survey comparing the intentions of people with disability who have a current home Internet connection show a more obvious pattern with significantly less saying they are likely to connect and significantly more saying they are unlikely to connect than those who did not report a disability (see Figure 4). Given that the majority of people with disability depend on government income support, this reveals significant affordability concerns for this group.

Figure 4 - Intention to connect to the NBN for people with disability.
(Source: World Internet Project Australian Survey 2011)

Of course, fixed broadband connections to the household are not the only form of Internet connection available. Whether people on a low income may have to rely on other forms of Internet access such as mobile and wireless, is a question to which we now turn.

WIRELESS BROADBAND AND MOBILE INTERNET

Recent ABS figures are remarkable, indicating there are now more wireless broadband subscribers (5.53 million as at December 2011) than fixed (5.49 million), and this does not include an additional 11 million or so mobile handsets that have an active Internet connection (Australian Bureau of Statistics (ABS) 2012).[1]

What does this explosion in mobile and wireless Internet connected devices mean for people on a low income? The Australian Communications and Media Authority (ACMA) notes that most people are using a combination of communications technologies to meet their needs. Rather than switching from one to another they are adding capabilities through mobiles, smart-phones, tablets, and wireless USB modems (Australian Communications and Media Authority 2010, 19-20). However, for a person on a low income, the decision is not so much "and/ add" but "either/ or" in terms of devices and services. The greater reliance on a pre-paid mobile phone by people on a low income, cited by community agencies who provide emergency relief, is evidence of this choice (Low Income Measures Assessment Committee 2012, 2).

RELATIVE AFFORDABILITY

Tablets, such as the Apple® iPad®, are rapidly changing the way people prefer to get online. They allow email, web browsing, social networking, basic word processing, photo capture and sharing and access to many information based services. They are also opening up new fronts on usability and accessibility for older people and people with disability. They may also be an affordable way of getting online when combined with a wireless Internet connection. For example, a mainstream tablet and wireless broadband connection could cost around $21.16 per fortnight (see Table 4). One prediction is that 39% of Australian households will have a tablet computer by 2013 (Neilson 2012b).

Smart-phone handsets (perhaps not ideal for seniors or people with disability due to the small form factor) may be an affordable option for highly mobile users, including people who do not have secure accommodation. For example, in-market offers start at around $99 for a fully functional Android device. The cost of the voice, text and data plan will depend on usage but generally $30 per month recharge provides for a basic amount of each (see Table 4). Smart-phones are becoming the mobile handset of choice for many people, with some surveys showing they account for 66% of new sales in the USA (Neilson 2012c) and 49% of mobile subscribers in Australia (Neilson 2012a).

	NBN + PC (new)	NBN + PC (reconditioned)	Wireless BB + Tablet	Mobile Internet + Pre-paid Smart-phone
Device	$937.00	$220.00	$679.00	$99.00
Software	$63.00		$31.47	
Cable/ WiFi/ SIM	$25.00	$25.00	$30.00	
Internet Plan per month	$49.95	$49.95	$15.00	$30.42
***Total cost per month**	$92.66	$60.16	$45.85	$34.55
***Total cost per fortnight (e.g., from Centrelink benefit)**	$42.77	$27.77	$21.16	$15.94
***Assuming two year contract/ usage**				

Table 4 - Comparison of some entry-level broadband access scenarios including devices
(Source: Listed prices from mainstream vendor web-sites as at 26 July 2012.)

A Fixed-Wireless Digital Divide?

There are some disparities between fixed and wireless broadband services given the different underlying technologies. For example, the included data allowances are generally much lower for wireless; bandwidth is on average much less (despite peak possibilities); latency and jitter are higher; and reliability of coverage and the impacts of congestion are greater factors. These can all affect the user experience. The exponential increase in data traversing mobile networks (Australian Communications and Media Authority 2012, 26-27) is a key factor driving the rollout of 4G technologies as carriers try to provide a reasonable user experience to ever greater numbers of people connecting with their smart-phones and tablets (cf. Wildstrom 2012).

In theory, the NBN will overcome any geographic digital divide once and for all when fully implemented. However, the mix of technologies that NBN will use (fibre, fixed wireless, satellite) will necessarily mean that geography will still be a factor in people's experience of broadband. Congestion, latency, jitter and weather will particularly affect people connected via wireless and satellite technologies. It remains to be seen whether the increasing use of high-bandwidth, low latency/ jitter applications such as video-calling and conferencing, and remote video streaming will be useable by all NBN connected customers. Further, people on a low income who may be dependent on wireless broadband or mobile Internet connections will also face these issues.

The debate between wired and wireless broadband access is now as old as the disputes about the NBN itself (cf. Given 2010). Again, there will be different choices made by different segments of the Australian population based on lifestyle and location. As alternative choices, particularly for people on a low income, the real question is whether services provided over the NBN can compete in regard to affordability.

It is clear that wireless networks should not be curtailed – for example, through holding back spectrum availability – in favour of the NBN because they will provide commercial competition to NBN Co and so keep prices lower. Further, they should not be curtailed given the possible reliance on pre-paid mobiles and mobile or wireless broadband services by people on a low income. Wireless, then, is likely to provide both affordability competition and complementarity for consumers.

While smart-phones and tablets offer many convenient services through a mobile or wireless broadband connection (e.g., banking and financial transactions), many services and web sites are not tailored for mobile access or suitable for use on a small screen. Filling out forms, signing and printing for record keeping is more difficult. Accessing multimedia rich educational sites is less reliable. Producing content beyond short messages and texts, and uploaded photos is more restricted. It is also unclear whether governments will invest in accessible apps that will support low-income people on the move (e.g. for fortnightly Centrelink income declarations). People on average incomes may be able to mix and match their devices and connections according to preference. This surfeit of options is not likely to be available to people on a low income.

SOME POLICY CONSIDERATIONS

Affordability is still a significant issue affecting the take-up of broadband services in Australia and the claimed comparable pricing of new services provided over the NBN will not necessarily improve low-income consumers' willingness to pay. There are potentially sizeable public benefits to be gained through increased take-up of broadband services given the significant utilisation of government and government funded services by low-income groups.

Increasing take-up through exposure to and experience with high capacity broadband

Studies have shown that experience in actually using broadband services most likely increases people's willingness to pay. For example, in the USA, it has been suggested that:

...experienced users are more aware of the full range of economic, entertainment, information and social benefits that the World Wide Web has to offer. Inexperienced users may also have less technical ability when using high-technology goods and service... If experience causes increased valuation, the policy implication is that correctly targeted private or public programs have potential to increase overall penetration... These programs could educate households about the benefits from broadband (e.g., digital literacy training), expose households to the broadband experience (e.g., public access) and/ or directly support the initial take-up of broadband (e.g., discounted service and/ or hook-up fees) (Rosston et al 2010).

Another example comes from the Kenniswijk program in the Netherlands. After initial take-up by over 95% of residents for a subsidised fibre-based broadband service, 75% of residents continued with their service on a commercial basis when the subsidy was discontinued after one year (Barr 2008; Sadowski et al 2009).

Singapore is also building a new fibre-based high capacity broadband network. At the same time as announcing the infrastructure project, in their 2006 budget, they also launched a number of demand side programs to encourage people on lower incomes, people with disability and seniors to take-up and utilise computers and broadband.

*The [*Singapore*] Government will build "Infocomm bridges", so that no student will be denied computer and Internet access due to financial destitution; people with disabilities can receive Infocomm training, improve employability and integrate with mainstream society; and the less tech-savvy elderly can be at ease with technology and get connected in the Digital Age* (Infocomm Development Agency 2007).

These programs, based on eligibility, include subsidised PC purchasing, subsidised broadband access for three years (including a mobile broadband option), with education and training. They also bring together government, commercial and not-for-profit organisations as partners to improve digital inclusion among these groups and to showcase compelling applications such as telehealth and virtual class rooms.

An economic basis for such public intervention is the potential social return on the investment, namely the improved social outcomes in health, education, employment and family relationships that may accrue from connecting a person on a low income to a stable broadband service. Such a scheme could test the potential for broadband to break the cycle of impoverishment through a variety of efficiently delivered services. There is also the potential, of course, for Government services to be provided more efficiently thus offsetting the cost of such an intervention.

...the government could also use the NBN to reduce its own costs of providing public services. For example, if Internet access through the NBN is ubiquitous, then it can be used to communicate with the general public and provide a variety of government services. To ensure universality, the government may wish to make a basic broadband service (say with a speed of 1 Mbps) freely available to all households. The provision of this service, together with a basic 'netbook' for low-income households, could be tendered by the government. The service could potentially pay for itself by lowering government costs in other areas such as social security and taxation (Gans and King 2010, 183).

In fact, such cost savings could potentially also fund the actual construction of an NBN-type network completely. An OECD study found:

"On average, a cost savings of between 0.5% and 1.5% in each of the four sectors [electricity, health, transportation and education] over ten years resulting directly from the new broadband network platform could justify the cost of building a national point-to-point, fibre-to-the-home network" (Enck and Reynolds 2009, 4).

This potential social and economic dividend could be used to create so-called Social Impact Bonds sold to interested private investors to provide start-up capital for such schemes, for example, in disadvantaged areas. The social benefits and cost savings would be monetised by Government and returned as interest to the holders of such Bonds (Scherer and Schenk 2012).

GOVERNMENT TELEPHONE ALLOWANCE

Direct government income support for access to telecommunications has existed since 1964 as a voucher scheme redeemable at the Post Office against the telephone bill, which was replaced in 1992 by the direct payment of a Government Telephone Allowance. In 2008 this was supplemented with an Internet allowance for certain people who had a home Internet connection and in 2009 it was rolled up with other allowances into a pension supplement payment for most age and disability related pensioners. Unfortunately, the current eligibility criteria appear to disadvantage people on a low income in two ways:

> (i)   most job seekers are *not* eligible; and
>
> (ii)   the higher rate is restricted to those who have a *home* Internet connection.

In light of the growing necessity for job seekers to have Internet access, and the growing utility of wireless and mobile broadband services, it seems anachronistic for Government policy to be so narrowly focussed. Better for all people receiving Government income support who have an Internet connection, whether fixed, wireless or mobile, to be supported to participate in the digital economy by receiving the higher rate of allowance (approximately $5.80 per fortnight indexed annually), modest as it is (Department of Human Services 2012).

UNIVERSAL SERVICE

Regulatory support for universal service provision continues to be restricted to the standard telephone service (the home phone), payphones and some other services. Before 2012-13 only the telecommunications industry was required to subsidise the costs of provision. However, now the Commonwealth Government is contributing a subsidy of $50 million in 2012-13 and 2013-14, rising to $100 million per annum in subsequent years (Conroy 2012a). I have previously described how accessibility and affordability of the standard telephone service have been implemented as later add-ons to the original universal service regime (Morsillo 2011).

Given that the NBN will eventually provide 100% geographic availability, albeit utilising three different technologies, a possible policy option would be to extend the notion of universality to cover broadband affordability with costs being potentially subsidised by industry and government through the Telecommunications Universal Service Management Agency (TUSMA). Such a program could be targeted through appropriate eligibility criteria and be implemented by effectively discounting the NBN wholesale charge for the entry-level service or even for a more "basic" service. This could be a way of building competition further with an incentive for RSPs to market to low income customers as a way of seeking to be net gainers from TUSMA rather than net payers. Such a policy option would require a further review of the USO arrangements and TUSMA's remit in regard to what constitute "public interest telecommunications services" under Part 2 of the *Telecommunications Universal Service Management Agency Act 2012* (cf. Corner 2012).

CONCLUSION

It is easy to talk about the NBN in generalities and national averages but as most marketers know consumers are not one uniform group – segmentation and targeting are important strategies in maximising take-up and consequent investment returns. This paper has been concerned with one or more such segments that make up some 20% of Australian households, namely those on very low incomes.

Affordability is a key parameter for household broadband take-up and utilisation. This has been recognised in government statements from the outset. However, given the economics of the NBN as a new infrastructure build, affordability for a significant proportion of the Australian population is unlikely to be realised in the short-term as entry level prices remain above their willingness or even capacity to pay. While there is some initial indication that the unbundling of broadband services from fixed line telephone services, which the NBN allows, will reduce access prices, it remains to be seen whether this will enable people on a low income to have their pre-paid mobile and home broadband service as well.

The NBN entry level service specification and cost may be set too high to accommodate low-income households. If this continues it will help sustain a market for cheaper but less capable wireless alternatives. Such lesser capability may particularly impact families with children and young people in education for whom access to interactive multimedia content is important. Be that as it may, it will be important to allow wireless broadband to compete with the NBN in order to maintain downward pressure on prices and thus increase affordability and improve take-up.

There are a number of policy levers the Government could use to improve take-up of the NBN for low-income households. In particular, finding ways for them to experience high-capacity broadband services for a period of at least 12 months may significantly change their willingness to pay based on household economies and efficiencies, and other benefits obtained including for health, education and job searching. Such efficiencies and benefits would also accrue to the costs of providing Government services. An early review of what constitutes public interest telecommunications services in a high capacity broadband environment is another policy lever. It is imperative that Government, industry, researchers and consumer organisations work together to ensure broadband affordability to enable all Australians to participate in the benefits of the digital economy.

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ENDNOTES

1. Following the ABS, the term wireless broadband is used here to mean access to the Internet by means of a dedicated data subscription. This would include USB modems, data cards and tablets. Mobile Internet refers to a mobile handset that has Internet connection capability.