# The Rationale for Universal Access to Digital Services

Mark Gregory [1]

RMIT University

## AJTDE - Vol 3, No 4 - November 2015 [2]

[3]

★ 31 [4]

**Abstract**

The regulated telecommunication markets found in many countries often include the social principle that telecommunications infrastructure should be reasonably available to all at fair and affordable rates. In Australia, this concept of universal service aims to ensure that all people, wherever they reside or carry on business, should have reasonable access, on an equitable basis, to standard telephone services and payphones. The hallmark of the universal service regime has been the reasonable availability of public payphones and the subsidised installation of telecommunications infrastructure at premises nationwide to provide standard telephone services. With the advent and ongoing evolution of broadband technologies a new need has arisen and that is for everyone to have reasonable access, on an equitable basis, to specified digital services, including egovernment services. This paper presents a position and identifies future research necessary to support the transition from the universal service regime to a universal access regime that enshrines the principle of ensuring that federal, state and local egovernment and other specified digital services are reasonably accessible to all, on an equitable basis, wherever they work or live.

# Introduction

The Australian Federal Government is overseeing the transformation of public service delivery from physical to online formats, with the Digital Transformation Office stating its intention to ?[e]ncourage users to choose the digital service and consolidate or phase out existing alternative channels where appropriate? (DTO 2015). The shift to online service delivery is likely to have the greatest negative impact on socially and economically disadvantaged sectors of the population who pay relatively more of their income for telecommunications and broadband services or rely on free public access, and are relatively high consumers of public services (Newman et al. 2010).

Australia?s universal service policy framework aims *to ensure that all people in Australia wherever they reside or carry on business, should have reasonable access, on an equitable basis, to standard telephone services and payphones* (ComLaw 2015b). However, the universal service regime does not include broadband which is needed to connect to digital online services and broadband attracts connection fees and an ongoing monthly charge on top of what is paid for telecommunications services and is proportionately less affordable for those with low incomes (SACOSS, 2015).

Limited access to online services is available in locations where governments, retailers, public libraries or other agencies operate free Wi-Fi hotspots or make internet-connected computers available for public use. Experiments to broaden such access, for example the New York public library service hot-spot loan program, have yet to be taken up in Australia (Brooklyn Public Library, 2015). Indeed, some municipal public libraries ? which are collectively Australia?s largest provider of free public Internet ? increasingly through Wi-Fi - struggle to finance their existing service (Australian Library and Information Association 2013).

This paper presents a position and identifies future research necessary to support the transition from the universal service regime to a universal access regime that enshrines the principle of *ensuring that Federal, State and Local egovernment and other specified digital services are reasonably accessible to all, on an equitable basis, wherever they work or live*.

Differentiation between universal service and universal access is key to the position presented within this paper and the rationale for the transition from universal service to universal access. Universal service is the equitable provision of telecommunications infrastructure for public payphones, telephone services at premises and other designated services. It is left to the individual to fund usage of the telecommunications infrastructure. Universal access is to provide everyone with equitable access to designated digital services and this regime would include telecommunications infrastructure, an account with a nominated telecommunications and broadband retail service provider and a monthly telephone and broadband data allowance. Universal access is therefore an extension of the existing universal service regime.

Key research questions introduced and discussed within this paper include what is universal access, why do we need it, how it would affect the telecommunications market, who would benefit and what would it cost. A brief review of the universal service regime is provided in the next section.

# Universal Service

The introduction and evolution of post and telecommunications universal service provisions has varied between nations in accordance with the range of principles that underpinned the competitive post and telecommunications markets that emerged in the 19th century. Postal reforms introduced in England in the late 1830s established a uniform affordable national postal rate as perhaps the first example of government commitment to encouraging universal communication service access, and a practice that would spread through the British Empire and beyond (BPMA 2015; Henkin, 2006).

The underlying principle of a universal service extended to telecommunications in the mid to late 19 th century, but it was not until 1907 that American Telephone and Telegraph President Theodore Vail specifically referred to the term *Universal Service* in relation to telecommunications (Mueller, 1993). Then, as Mueller (1993) points out, Vail was not using the term to promote the social desirability of a universally accessible telecommunication system, but the need to unify the duplicated and disconnected series of telephone networks that had emerged in the United States. While Mueller (1993, 1997) argues that it was not until the 1960s that universal service was practiced in its modern social sense in the United States, the principle was codified in the preamble to the 1934 Communications Act (FCC 1934) which sought: ?to make available, so far as possible, to all people of the United States, a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges?.

In Australia, Corner (2012) argues that universal service was a founding principle of the Postmaster General?s Department (PMG), the body formed to control telecommunications as a constitutional interest of the new Commonwealth of Australia in 1901. It informed the primary practices of the PMG in building ?a national telegraph and telephone network that progressively reached new towns and settlements? (Wilson and Goggin, 1993; McElhinney, 2000). The Commonwealth?s monopoly on telecommunications provision until the late 1980s made the administrative practice of Universal Service provision and regulatory 0versight relatively straightforward. Staged deregulation during the 1990s and simultaneous privatisation of the statutory authority (Telecom) that in 1975 had assumed direct responsibility for telecommunications provision (including a universal service obligation) from the PMG, complicated matters somewhat. Given that the privatised incumbent, now known as Telstra, retained control of the nationwide wired network, it initially remained responsible for fulfilling the industry?s Universal Service Obligation. The costs of such activity were met by funds drawn from all commercial telecommunication carriers and federal government subsidies.

Although a range of Commonwealth legislation (ComLaw 2015a, 2015b, 2015c, 2015d) is relevant to the principle and practice of universal service in Australia, in the post-deregulation period it is primarily codified within the 1999 Telecommunications (Consumer Protection and Service Standards) Act. This Act aims ?to ensure that all people in Australia wherever they reside or carry on business, should have reasonable access, on an equitable basis, to:

(a) standard telephone services; and

(b) payphones

(ComLaw 2015b)

To facilitate the provision of Universal Service and ?public interest telecommunications services? the Australian Government determined that a levy would be imposed on certain telecommunications carriage service providers under the *Telecommunications (Industry Levy) Act 2012* (ComLaw 2015e).

Public interest telecommunications services include:

1. standard telephone services;
2. payphones;
3. emergency call services; and
4. the National Relay Service.

In 2012 the Australian Government surprisingly entered into a twenty-year contract with Telstra for the ongoing provision of the USO with only minor changes to the USO regime. Submissions to the triennial Regional Telecommunications Review carried out in 2012 and literature available at that time highlighted the need for more substantial changes to the USO but this did not eventuate (Corner, 2012; Darling, 2012).

The most recent Regional Telecommunications Review (RTIRC, 2015) recommended that the Federal Government look to broaden the USO regime to include online services without offering specific mention of the technologies that should be included. This call to include broadband in the USO regime reiterates earlier arguments made in recent years (Bryne Potter, 2007; Given, 2008) that Universal Service should embrace broadband delivery of online services and that substantial change to the USO and the terms of access to telecommunications are needed (Given, 2008; Goggin, 2010; De Ridder, 2015; Taylor, 2010; Fieldgrass, 2011; Humphrey, 2014; SACOSS, 2015).

# Definition of universal access

Universal access, for the purposes of this paper, is defined as a scheme to provide everyone with equitable access, wherever they work or live, to designated digital services, such as telephony and online egovernment services, and this regime would include telecommunications infrastructure, an account with a nominated telecommunications and broadband retail service provider and a monthly telephone and broadband data allowance. Universal access is therefore an extension of the existing universal service regime.

A full definition of the concept and parameters of a universal access regime is needed before proceeding to gauge the market impact and this is left to future research.

The purpose of a universal access regime is not to supplant or to replace the USO but to encompass the USO in a broader scheme that is timely, reflects the changing society in which we live and ensures that everyone has access to egovernment and other prescribed digital services.

# Why is Universal Access needed?

Federal, state and local governments are encouraging online engagement as a cost saving measure and with clear efficiency dividends for users,

though equally the removal of physical services may penalise some people, e.g. in regional and remote areas and there is a need therefore for a balanced approach to service delivery and improved access to online egovernment services.

For those unable to afford telecommunications services, universal access could provide free or low-cost (subsidised) devices and accounts with selected retail (Internet) service providers, permitting socially or economically disadvantaged Australians to connect to digital networks.

In this paper the transition from physical government service delivery to online egovernment service delivery is highlighted to demonstrate why universal service is needed and why the cost of a universal access regime is affordable.

## eGovernment Strategy Savings

In 2015 Deloitte estimated that if traditional (face-to-face, telephone and postal) transactions could be reduced from 40% to 20% of all transactions over a ten-year period, productivity, efficiency and other benefits to government worth around $17.9 billion would be realised along with savings in time, convenience and out-of-pocket costs to citizens worth a further $8.7 billion (Deloitte, 2015, p.1). Substantial citizen engagement with government already occurs online, with some 58% of the 14.9 million people aged 15 and over who had used the internet at home in 2012/13 spending some time accessing government services (ABS, 2013, Table 7). This, of course, underestimates online government service use as it fails to account for out-of-home access ? an access mode undoubtedly increasing in accordance with the trend of rapid and substantial increases in mobile data use (ACMA 2014, p.9). Furthermore, as the South Australian Council of Social Service reported in 2015, online access has become not only fundamental to efficient and effective government service use, but with citizen consultation on policy matters increasingly conducted through online platforms, to the democratic process itself (SACOSS, 2015, p.3).

# The Impact of Universal Access on the Telecommunications Market

The impact of a universal access regime is a sensitive topic for segments of the telecommunications market. The Communications Alliance (CA), the peak body representing telecommunications carriers, has argued against data being included in a revised USO (CA, 2008). CA (2008) has argued that inclusion of data in the USO would force the government to further regulate data charges. However, universal access would benefit businesses that offer products and services online and telecommunication companies through the opportunity to increase customer numbers, facilitate improved customer relations and gain valuable data related to customer location and online activity. Furthermore, the regime could be financed through savings to governments achieved through the shift to online public service provision.

Government intervention in telecommunications markets to promote open and fair competition is not without precedent, and has resulted in a raft of legislation and regulation, for example, backhaul competition (ACCC 2015a), access to monopoly infrastructure (ACCC 2015b) (ComLaw 2014) and not forgetting the USO and its associated industry levy.

## Regulation of Data Usage Charges

The argument by CA that mobile cellular and other data usage charges should not be regulated is moot because fixed access wholesale access and backhaul network data usage charges have effectively become regulated with the introduction of the NBN and other regulations including the Australian Competition and Consumer Commission (ACCC) regulation of monopoly infrastructure. Examples of regulation that affect data usage charges are provided in this section.

For the NBN two key connection and data usage charges are the:

1. Access Virtual Circuit (AVC). The bandwidth allocated to the end-user premises charged at a tiered rate (NBN Co 2015a). The AVC charge for a 12/1 Mbps connection is $24 per month and for a 25/5 Mbps connection it is $27 per month.
2. Connection Virtual Circuit (CVC). Determines the capacity required to serve each Connectivity Serving Area (CSA). A CSA is a logical collection of end-user premises defined by NBN Co. Each CSA has approximately the same number of end-user premises. The CVC is an aggregation of the AVCs from the end-user premises back to the Point of Interconnect (PoI). A CVC services up to 4000 customers in a single CSA and the CVC charge is currently $17.50 per Mbps per month.

On 8 October 2015 the ACCC, acting as the monopoly infrastructure regulator, revised (ACCC 2015b) the access charges for fixed line services utilising Telstra?s copper access network (related to retail ADSL) in the period from 1 November 2015 to 30 June 2019. For ULLS the charge is between $14 to $44, and for reselling ADSL it is between $22 and $27.

In response to recent NBN related fixed access competition the government (ComLaw 2014) has stipulated that for the provision of a regulated superfast carriage service for a period of two years beginning on 1 January 2015 ?the price offered for the supply of a Layer 2 Wholesale Service must not be more than $27 on a per port basis?. NBN Co has incorporated this supply charge into the AVC charge.

The argument against further regulation of data usage put forward by the CA is based upon the strong belief of its members that mobile cellular and other data usage charges should be unregulated and that whilst NBN Co sets a wholesale CVC data usage charge there remains aspects of data usage that are not regulated, for example, backhaul charges where there are more than three backhaul providers.

However, the underlying cost of data is decreasing because transmission technology costs are falling, transmission capacity is increasing, customer numbers are increasing and overall data usage continues to grow at a nearly exponential rate. Evidence for this trend has most recently been the decrease in NBN Co?s CVC charge from $20 per Mbps per month to $17.50 in 2015

The proposal in this paper might lead to data usage price regulation on access networks where data usage charges are not currently fully regulated. However, the argument against data usage price regulation is deemed to be insufficient justification for not proceeding with universal access when the benefits include national innovation, egovernment service delivery, competition and social perspectives.

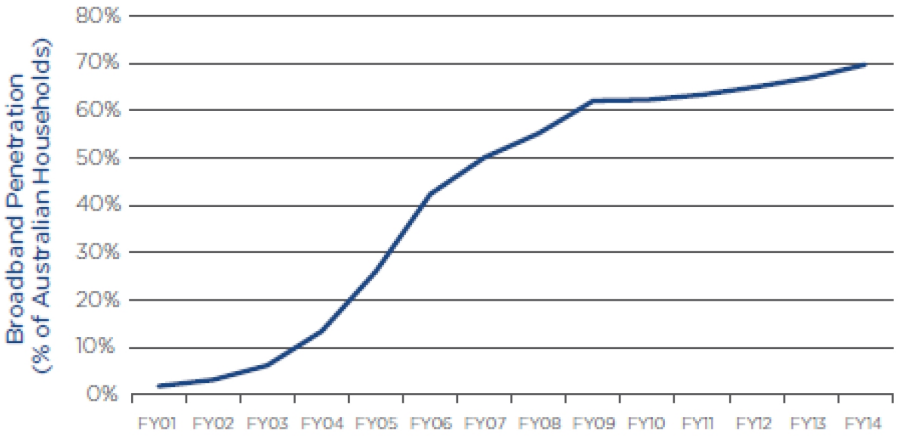
To gain an understanding of this trend let us consider figures provided in the NBN Co corporate plans over the past five years.

## NBN Customer and Data Usage Projections

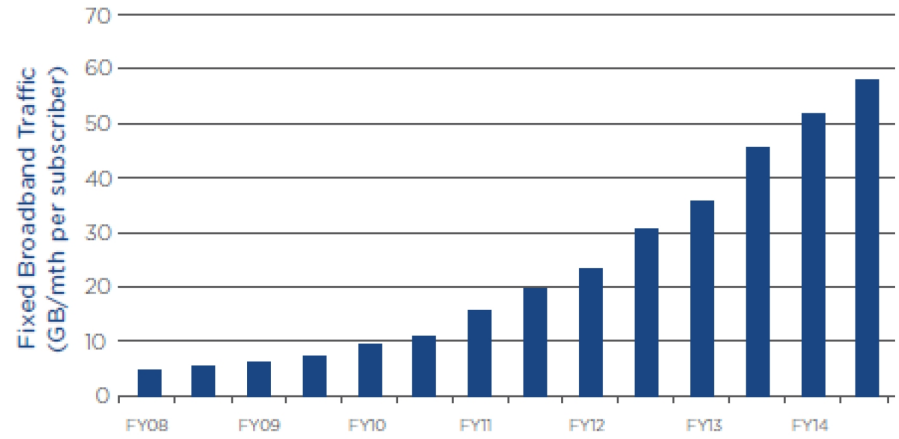
NBN Co?s corporate plans provide projections for the monthly Average Revenue per End User (ARPU) to Financial Year (FY) 2039 based on an average internal rate of return of not less than 7 per cent. In the NBN Co Corporate Plan 2012 (NBN Co 2012:8.2.10) the projection showed the monthly ARPU for FY 2012 at about $20 rising to $40 in FY 2015 and reaching more than $100 by FY 2039. The NBN Co Corporate Plan 2016 (NBN Co 2016: 5.4) reported the monthly ARPU was expected to rise from $40 in FY 2015 to $44 in FY 2018 based on ?continued double digit growth in volume through changed consumer behaviour and higher speed tiers as a result of application and device demand expanding?.

The NBN Co Corporate Plan 2016 provided a historical analysis for broadband penetration, Figure 1, and fixed broadband traffic, Figure 2, based on Australian Bureau of Statistics (ABS) data.

Figure 1 shows that broadband penetration has reached 70 per cent of households and the Figure 2 shows that the traffic volume passed 50 GB per customer per month.




[5]**Figure 1 ? Historical Australia broadband penetration (NBN Co 2016: Exhibit 4)**




[6]**Figure 2 ? Historical Australia fixed broadband traffic (NBN Co 2016: Exhibit 5)**

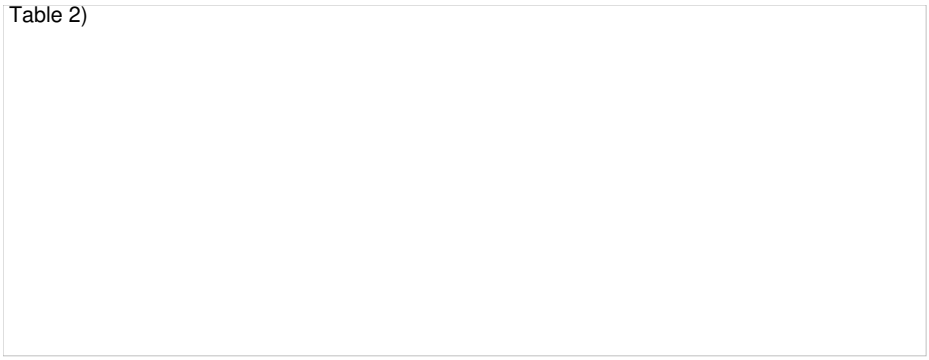
## Revenue and Subscriber Estimates

In Australia, NBN Co has estimated that about 11.9 million premises will be connected to the NBN, using the technology mix shown in Figure 3, by the end of the rollout in 2020. Until such time that NBN Co offers a wider wholesale product range, including wireless products, a limiting factor for growth will be the number of premises that can be connected to the NBN.

As an example consider approximately 70 per cent of the premises opt to connect to the NBN, Figure 1, then NBN Co?s AVC and CVC revenue for 12/1 Mbps connections with 50 GB data would be about $200 million and $33.3 million per month respectively with a 50 per cent peak load adjustment. NBN Co?s lost AVC and CVC revenue for the remaining 30 per cent of premises that do not connect to the NBN would be $85.7 million and $14.3 million respectively.

The ABS figures for mobile handset subscribers (ABS 2015a) shows that there are about 21 million subscribers that downloaded about 1.1 GB of data per subscriber per month and figures for Internet subscribers (ABS (2015b) shows there are approximately 12.8 million Internet subscribers divided intc four categories: (1) mobile and fixed wireless; (2) cable, fibre, satellite & other; (3) DSL; and (4) Dial-up.

Table 2)



[7]

**Figure 3 ? Multi-Technology Mix of Premises (NBN Co 2016: Table 2)**

The total number of machine to machine connections over digital networks is likely to be between 25 and 50 million by 2020 and the Internet of Things (IoT) is likely to ensure that there will be continued growth in demand to connect devices to telecommunication networks (Budde, 2015).

# Implementing a Universal Access Regime

The existing USO ensures that the standard telephone service and payphones are ?reasonably accessible to every Australian on an equitable basis?, wherever they work or live (ComLaw, 2015b).

The USO focuses on infrastructure accessibility and over past decades there has been growth in the number of different access networks that can be utilised. In some areas the copper access network that has been the mainstay for the USO is being phased out and this means it is time for the USO to be updated to become a regime that is *to ensure voice, video and data are reasonably accessible to Australians on an equitable basis, wherever they work or live*. A regulated definition for voice could specify Voice over Internet Protocol or variants including Voice over Long Term Evolution or other wireless technology. The solution as to what key services are provided and how are not germane to this paper and left for future research.

# Technology Choice

To provide universal access to telecommunications and broadband it is important for the USO to be modernised to include all of the access network technologies that have been deployed or may be deployed in the future to connect *Australians on an equitable basis, wherever they work or live* to the *egovernment and other specified digital services*.

The shift to converged telecommunications (Vanston 2008), in which services that utilise voice, video and data are delivered using a common transmission mechanism, for example the Internet Protocol, has offered the opportunity to focus on improved quality and security whilst facilitating connectivity and user presence across different access networks, e.g. satellite, fixed and mobile wireless networks, fixed access networks, and Wi-Fi.

Wireless technologies facilitate mobility, albeit depending on the wireless technology and the extent that that technology has been deployed nationally. Whilst the broadest national coverage is currently provided by satellite followed by mobile cellular and lastly by Wi-Fi and even though the wireless access network footprints overlap there is a cost and capability justification for this practice.

The USO should be formally expanded to include wireless technologies and to focus on enhanced accessibility beyond the current focus on connections to residential premises. Previous and current federal, state and local government programs have committed many hundreds of millions to mobile cellular black-spot coverage and public Wi-Fi. It is timely to centralise and coordinate the various public funding programs for wireless technologies with the goal of enhancing USO outcomes.

The low cost, high capacity and recent rapid increase in Wi-Fi deployment makes it a strong candidate for an expanded USO that underpins universal access and the decision by Telstra to roll out a national Wi-Fi network provides guidance that Australia?s largest telecommunications company has a strong view as to the viability and future of Wi-Fi.

Another benefit that would be attained by adding wireless access networks to the USO is to enhance ?connectedness? which is the state of being digitally connected at all times.

## Always Connected

A key goal for a universal access regime is that people should be able to connect to digital networks at all times so that they can access *egovernment and other specified digital services* whenever there is a need. What this means is that Australians should be able to connect to every available access network as they move around their local region or around the nation.

Mobility is a key aspect of our lives and being mobile should not mean that we lose access to the digital network the minute we step outside our homes or office.

There are limitations related to the reasonable cost, coverage and capacity of the different wireless access network technologies and how mobility access is to be provided is left for further research, however, the argument for a national Wi-Fi network to supplement mobility Internet access is discussed in the next section.

## Enhancing Wireless Access

Telecommunication carriers are increasingly bundling products and services as a means to boost or retain customer numbers and over the coming decade it should become the norm for customers to be offered product plans that include mobile and fixed network services thereby increasing connectedness.

Technologies such as Electronic Numbering (Jammulamadaka, 2010) have been introduced to manage the process of identifying someone?s network connected devices and which device is most likely to provide either a voice, video or data connection or permit a message to be left. This is an important enabling technology as many people now find themselves utilising a number of network connected devices that can be used for voice, video

and data.

Of the wireless technologies (satellite, mobile cellular and Wi-Fi) available to provide mobile universal access probably the most interesting development today is the introduction of national Wi-Fi networks, such as Telstra Air (Telstra, 2015).

Telstra Air is being rolled out utilising two infrastructure components. The first is to configure secure multi-user Wi-Fi onto the residential broadband gateway devices of Telstra Air customers utilising Fon (Fon, 2015). Fon is a secure system that permits multi-user access to the Internet via a Wi-Fi gateway whilst limiting access to the local network and resources to the gateway owner. After being authenticated by the Fon system Telstra Air customers can connect to the Internet when in the vicinity of Telstra Air-activated residential broadband services, meaning that Telstra Air customers are sharing their home broadband connections with other Telstra Air customers. The second is a more traditional infrastructure approach where Telstra Air access points (i.e. Wi-Fi hotspots) are distributed utilising existing and new infrastructure.

Where Telstra Air becomes particularly interesting is the rollout of access points at payphone locations. Payphones are directly linked to the USO which provides funding for the installation and operation of many of the Telstra payphones. Telstra payphones were strategically located to ensure that maximum accessibility was achieved.

There are about 60,000 Telstra payphone sites located around Australia and the telecommunications and power infrastructure necessary for Telstra Air exists at nearly all payphone locations, even those previously decommissioned due to lack of use or redistribution. Telstra?s projections are that about two million Australians could join Telstra Air by 2020.

In addition to the subscriber access to Telstra Air, Telstra is entering into cost sharing agreements with local governments to provide free Wi-Fi at key locations such as near schools, local shops and sporting facilities. Telstra was recently awarded a contract by the Tasmanian government to provision 50 public Wi-Fi networks in popular tourist destinations around the state. Clearly, Telstra ? benefitting from the USO agreement ? is positioning itself powerfully in this area.

Whilst Telstra goes from strength to strength with a clear strategy to enhance its wireless access network offerings with the addition of Telstra Air, the government and NBN Co have failed to respond with a wholesale Wi-Fi product offering thereby effectively ensuring dominance in the wireless mobility market remains with Telstra. None of the other telecommunications companies can build a competitor to Telstra Air as they do not have a national infrastructure network equivalent to that owned by Telstra.

A universal access regime and modernised USO means that the NBN could have an important role to play in providing accessibility and connectedness, however, NBN Co is yet to add wireless wholesale products to its product range.

If NBN Co were to put Wi-Fi access points at the 60,000 plus nodes and at other key locations being installed throughout the FTTN, FTTB, FTTP and HFC networks and to offer a wholesale Fon solution via the 12 million estimated premises that will be connected to the NBN then the remainder of the telecommunications industry could offer a Telstra Air like retail product further increasing competition and this would enhance the opportunity for a universal access regime to utilise one or more retail service providers.

At this point there would be a substantial national Wi-Fi rollout that would also include existing Wi-Fi such as that offered by local government, libraries and some retailers.

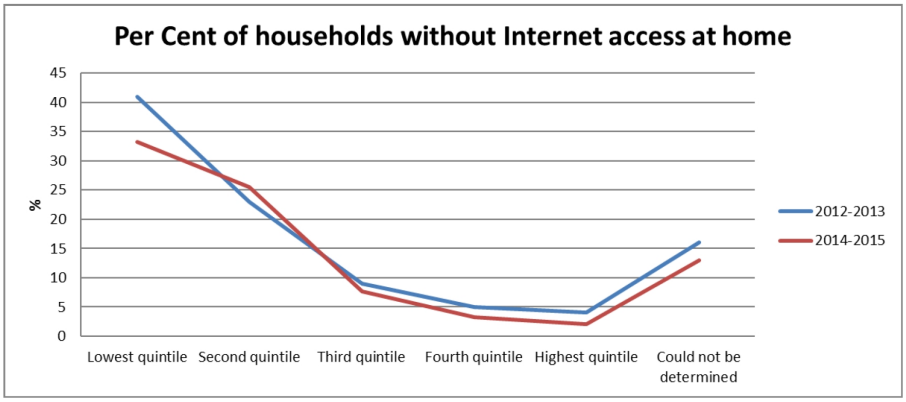
# Universal Access Beneficiaries

Reasonably accessible infrastructure doesn?t mean that everyone can afford the charges to use the infrastructure to access egovernment services or other designated services. Consistent with the social risk and welfare principles underpinning Australia?s social democracy, a regime is needed to ensure that universal access to prescribed services is affordable for all.

The Australian Bureau of Statistics (ABS, 2015) that about 30 per cent of Australian households do not have fixed broadband connections and that in the period 2014-15 the number of households with access to the Internet at home increased to 86 per cent of all households ? up from 83 per cent in 2012-13 (ABS, 2016), as shown in Figure 4.

The ABS figures exclude the homeless and itinerant. An itinerant worker might move often and the individual or family may live in temporary accommodation without fixed broadband access. Itinerant workers are likely to fall into the lowest income category and not have mobile cellular Internet enabled devices due to cost.

Humphry (2014) identified a cohort of people who prioritize access to telecommunications over other services. For the 20 to 25 per cent of Australians (De Ridder, 2015) that are socially and economically disadvantaged, the conventional test of affordability ? where a telecommunication service can be accessed without compromising expenditure of other necessities - may not be met. This means that free or low cost universal access is necessary if prescribed services are to be accessible to all.



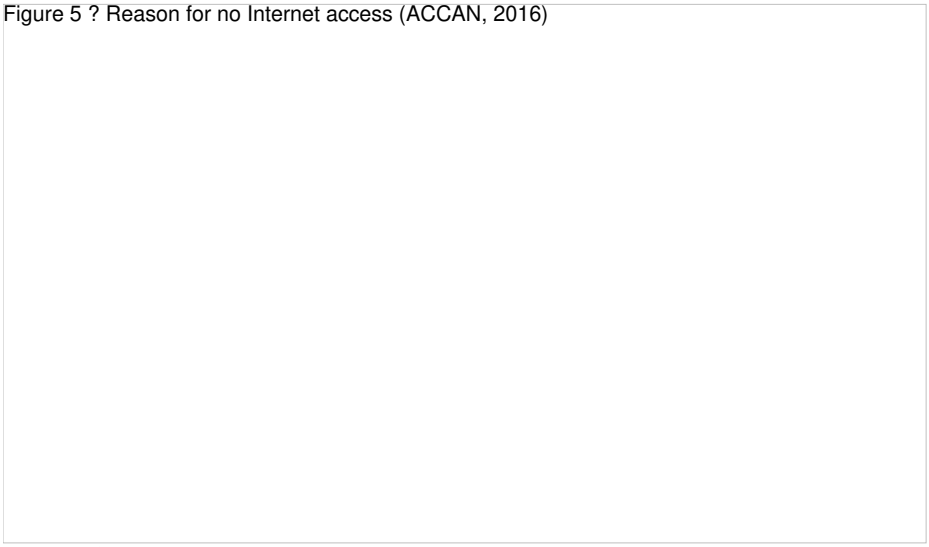

[8]**Figure 4 ? Per Cent of households without Internet access at home (ACCAN, 2016)**

The ABS collected, for the first time, the main reasons for a household to not have Internet access as shown in Figure 5 and of the 1.3 million Australian households (14 per cent) without Internet access at home in 2014-15 the primary reason given was no need (63 per cent), but when children under the age of 15 years are in a household the primary reason for not having Internet access at home was cost (43 per cent).

It is demonstrable therefore that a significant number of children are not able to benefit from Internet access for education and social interaction due to the limits on the household budget. Of the remainder that indicated the household had no need for Internet access at home the question arises if this response was given to hide household finances or a lack of knowledge of the benefits of Internet access.

Identifying that a percentage of households without Internet access lack the confidence or knowledge to go online highlights another item for future research, which is the number of people that need education on how to access and utilise the Internet.

Figure 5 ? Reason for no Internet access (ACCAN, 2016)



[9]

**Figure 5 ? Reason for no Internet access (ACCAN, 2016)**

# Funding Universal Access

The cost of providing universal access has two components, the first component is the charge associated with a connection and monthly data usage and the second component, currently associated with the USO, is the installation of infrastructure.

The premise behind a universal access regime is the principal that the socially and economically disadvantaged should be provided with equitable access to the Internet as there is a net benefit to the nation if everyone can access *egovernment and other specified digital services*. Equitable access implies that some would be provided with free access, and others provided with subsidised access based on need.

There is also a net benefit from a universal access regime to companies offering products and services over telecommunications and broadband. Information is valuable and the knowledge that is gained can be used to set the future direction for research and development expenditure. The provision of egovernment services, such as ehealth and eEducation, is a growing market for private enterprise and knowledge of potential consumers of egovernment services is vital.

Universal access could be funded either by the government directly or with the addition of a levy on telecommunications companies and companies offering digital products and services that would benefit from a universal access regime (e.g. multi-nationals or Australian companies that offer products and services over digital networks).

For example, in the U.S.A. Google Fiber (Google, 2015) provides a free low speed broadband connection to those that opt for this service after paying a US$300 connection fee. What this means is that Google is internally subsidising the cost of providing the low speed broadband connection and the cost of doing so decreases as more customers join the Google Fiber network.

If the universal access regime funding model includes an industry levy it is likely the scheme it would operate on a cost recovery model that reduces the overall cost by removing profit. An aspect of potential future research is to analyse the possibility for competitive provision of universal access and universal service schemes.

The cost of providing universal access to premises depends on whether or not fixed-access network infrastructure is available and for other scenarios including socially and economically disadvantaged that are homeless, itinerant or live in shared or low cost housing.

The cost of a universal service regime would depend on the number of people affected, access technologies to be used, whether access is to be free or subsidised and the amount of data allocated per month. The development of a funding model and an industry levy model, if it is determined that industry is to contribute, is left for future research.

# Conclusions

This paper sets out the rationale for a universal access regime to *ensure that access to Federal, State and Local egovernment and other specified digital services are reasonably accessible to Australians on an equitable basis, wherever they work or live*. A universal access regime shifts the focus from infrastructure accessibility to access to digital services.

To facilitate universal access to digital services utilising telecommunications and broadband there is an important need for wireless technologies including satellite, mobile cellular and Wi-Fi be incorporated and for the significant annual federal, state and local government funding for wireless technologies to become a part of a universal access strategy.

In a social democracy there are valid reasons that justify a universal access scheme. It is important that government and industry collaborate to identify how the scheme would be implemented. The cost to government of a universal access scheme could be reduced through an industry levy.

This paper presents a position and identifies future research necessary to support the transition to a universal access regime that enshrines the principle of *ensuring that federal, state and local egovernment and other specified digital services are reasonably accessible to all, on an equitable basis, wherever they work or live.*

# Acknowledgements

This research was supported under Australian Research Council's Discovery Projects funding scheme (project number DP150102818).

# References

ACCAN, (2016), Graphs of the latest ABS data, Australian Communications Consumer Network, http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/ACC2D18CC958BC7BCA2568A9001393AE?opendocument [10], [Accessed 25 February 2016]

ACCC, (2015a), ACCC?s role in regulated infrastructure, Australian Competition and Consumer Commission, https://www.accc.gov.au/regulated-infrastructure/about-regulated-infrastructure/acccs-role-in-regulated-infrastructure [11], [Accessed 1 December 2015]

ACCC, (2015b), ACCC Fixed line services decision leads to one-off uniform fall in access prices of 9.4%, Australian Competition and Consumer Commission, https://www.accc.gov.au/media-release/accc-fixed-line-services-decision-leads-to-one-off-uniform-fall-in-access-prices-of-94 [12], [Accessed 1 December 2015]

ACMA, 2014, *Communications Report 2013-14*, Australian Communications and Media Authority, Melbourne.

AT&T, (2015), ?One Policy, One System, Universal Service?, American Telephone and Telegraph, http://www.corp.att.com/history/milestone_1908.html [13], [Accessed 1 December 2015]

ABS, (2013) Household Use of Information Technology, Australia, 2012-13, Cat no. 8146.0.

ABS, (2015a), Mobile Handset Subscribers, Australian Bureau of Statistics, June 2015, http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/8153.0Main%20Features5June%202015?opendocument&tabname=Summary&prodno=8153.0&issue=June%202015&num=&view= [14], [Accessed 1 December 2015]

ABS, (2015b), Type of Internet Connection, Australian Bureau of Statistics, June 2015, http://www.abs.gov.au/ausstats/abs@.nsf/mf/8153.0 [15], [Accessed 1 December 2015]

ABS, (2016), 8146.0 - Household Use of Information Technology, Australia, 2014-15, http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/ACC2D18CC958BC7BCA2568A9001393AE?opendocument [10], [Accessed 25 February 2016]

Australian Library and Information Service, (2013), ALIA Internet Access in Public Library Survey 2013, https://www.alia.org.au/sites/default/files/publishing/ALIA%20Internet%20Access%20in%20Public%20Libraries%20Survey%202013%20FINALweb.pdf [16], [Accessed 1 December 2015]

BPMA, (2015), ?Rowland Hill?s Postal Reforms?, The British Postal Museum and Archive, http://www.postalheritage.org.uk/explore/history/rowlandhill/ [17], [Accessed 1 December 2015]

Brooklyn Public Library, (2015), Library HotSpot Loan Program, Brooklyn Public Library, http://www.bklynlibrary.org/hotspot [18], [Accessed 1 December 2015].

Bryne Potter, A., & Clement, A., (2007), *A Desiderata for Broadband Networks in the Public Interest,* 35th Research Conference on Communication, Information and Internet Policy, Arlington, VA., http://cwirp.ca/files/potter_clement_tprc_2007.pdf [19], [Accessed 1 December 2015]

Budde, P., (2015), ?Australia ? M2M and the Internet of Things?, BuddeComm, http://www.budde.com.au/Research/Australia-M2M-and-The-Internet-of-Things.html [20], [Accessed 1 December 2015]

CA, (2008), Universal Service Obligation Review, 8 February 2008, http://www.commsalliance.com.au/__data/assets/pdf_file/0016/1960/CommsAlliance-Subsmission_USO_Final.pdf [21], [Accessed 1 December 2015]

ComLaw, (2014), Carrier Licence Conditions (Networks supplying Superfast Carriage Services to Residential Customers) Declaration 2014, Commonwealth of Australia, https://www.comlaw.gov.au/Details/F2014L01699 [22], [Accessed 1 December 2015]

ComLaw, (2015a), Telecommunications Act 1997, Commonwealth of Australia, https://www.comlaw.gov.au/Details/C2015C00540 [23], [Accessed 1 December 2015]

ComLaw, (2015b), Telecommunications (Consumer Protection and Service Standards) Act 1999, Commonwealth of Australia, https://www.comlaw.gov.au/Details/C2015C00390/Html/Text#_Toc427849452 [24], [Accessed 1 December 2015]

ComLaw, (2015c), Trade Practices Act 1974, Commonwealth of Australia, https://www.comlaw.gov.au/Details/C2004A00109 [25], [Accessed 1 December 2015]

ComLaw, (2015d), Competition and Consumer Act 2010, Commonwealth of Australia, https://www.comlaw.gov.au/Details/C2015C00327 [26], [Accessed 1 December 2015]

ComLaw, (2015e), Telecommunications (Industry Levy) Act 2012, Commonwealth of Australia, https://www.comlaw.gov.au/Details/C2015C00465 [27], [Accessed 1 December 2015]

Corner, S., (2012), Universal Telecommunications Services: A Brief History and Analysis of the Issues Surrounding the New Australian Legislation on the Universal Service Obligation, *Telecommunications Journal of Australia, 62*(2), 22.21-22.29.

Darling, P., (2012), Universal Telecommunications Service for the 21st Century, *Telecommunications Journal of Australia, 62*(2), 23.21-23.29.

Deloitte, (2015), Digital government transformation, Commissioned by Adobe, http://www2.deloitte.com/content/dam/Deloitte/au/Documents/Economics/deloitte-au-economics-digital-government-transformation-230715.pdf [28], [Accessed 1 December 2015]

De Ridder, J., (2015), *The Future of the Universal Service Obligation (USO),* Sydney: Australian Communications Consumer Action Network, http://accan.org.au/our-work/research/1132-the-future-of-the-uso [29], [Accessed 1 December 2015]

DTO, (2015), Digital Service Standard, Digital Transformation Office, Commonwealth of Australia, https://www.dto.gov.au/standard [30], [Accessed 1 December 2015]

DSS, (2014), Statistical Paper no. 12: Income support Customers: a statistical overview 2013 based on DHS and DVA administrative data, Department of Social Services (DSS), Commonwealth of Australia

FCC, (1934), U.S. Government Communications Act, Chapter 5 of Title 47 of the United States Code, 19 June 1934, http://uscode.house.gov/statviewer.htm?volume=48&page=1064 [31], [Accessed 1 December 2015]

Fieldgrass, L., & The Brotherhood of St. Laurence, (2011), *Mobile Matters: The Youth Advocates Project*, Sydney, Australian Communications Consumer Action Network, http://accan.org.au/files/Reports/Mobile%20Matters%20Youth%20Advocates%20Project.pdf [32], [Accessed 1 December 2015]

Fon, (2015), Fon is the Global WiFi Network, Fon, https://fon.com/ [33], [Accessed 1 December 2015]

Given, J., (2008), The Eclipse of the Universal Service Obligation: Taking Broadband to Australians, *info, 10*(5/6), 92-106.

Goggin, G. (2010). Realising Universal Communications. Australian Communications Consumer Action Network (ACCAN) Conference. Melbourne, https://accan.org.au/files/Reports/Realising%20Universal%20Communication... [34], [Accessed 1 December 2015]

Google (2015), Google Fiber, Google, https://fiber.google.com/ [35], [Accessed 1 December 2015]

Gregory, M. A., (2014) What?s good for Telstra is good for NBN Co, Business Spectator, 23 October 2014, http://www.businessspectator.com.au/article/2014/10/23/technology/whats-good-telstra-good-nbn-co [36], [Accessed 1 December 2015]

Henkin, D.M., (2006), The postal age the emergence of modern communications in nineteenth-century America, University Of Chicago Press, Chicago.

Humphry, J., (2014), *Homeless and Connected ? Mobile Phones and the Internet in the Lives of Homeless Australians*, Sydney, University of Sydney and Australian Communications Consumer Action Network, http://accan.org.au/grants/current-grants/619-homeless-and-connected-mobile-phones-and-mobile-internet-in-the-lives-of-families-and-young-people-experiencing-homelessness [37], [Accessed 1 December 2015]

IXIA, (2013, December), Quality of Service (QoS) and Policy Management in Mobile Data Networks, White Paper, http://www.ixiacom.com/sites/default/files/resources/whitepaper/policy_management.pdf [38], [Accessed 1 December 2015]

Jammulamadaka, A. T., Gregory, M.A. (2010), Infrastructure ENUM implementation in Australia, in TENCON 2010, 2010 IEEE Region 10 Conference, pp. 2304-2309, 21-24 Nov. 2010, doi:http://doi.org/10.1109/TENCON.2010.5685997 [39]

McElhinney, S, (2001), 'Telecommunications liberalisation and the quest for universal service in Australia', Telecommunications Policy, vol.25, no.4, pp.233-248.

Mueller, M., (1993), 'Universal service in telephone history: A reconstruction', telecommunications Policy, vol.15, no.5, July, pp.352-369.

Mueller, M., (1997), Universal service : competition, interconnection, and monopoly in the making of the American telephone system, MIT Press, Cambridge.

NBN Co, (2012), Corporate Plan, NBN Co, http://www.nbnco.com.au/assets/documents/nbn-co-corporate-plan-6-aug-2012.pdf [40], [Accessed 1 December 2015]

NBN Co, (2015a), Glossary of terms, NBN Co, http://www.nbnco.com.au/content/dam/nbnco/documents/glossary.pdf [41], [Accessed 1 December 2015]

NBN Co, (2016), Corporate Plan, NBN Co, http://www.nbnco.com.au/corporate-information/about-nbn-co/corporate-plan/corporate-plan.html [42], [Accessed 1 December 2015]

Newman, L., Biedrzycki, K. and Baum F., (2010), ?Digital Technology and Use Among Socially and Economically Disadvantaged Groups in South Australia?, Journal of Community Informatics 6(2) http://ci-journal.net/index.php/ciej/article/view/639/582 [43] [Accessed 1 December 2015]

PricewaterhouseCoopers LLP, (2009), Champion for Digital Inclusion ? The Economic Case for Digital Inclusion. London: Race Online 2012 and PriceWaterhouseCoopers. http://parliamentandinternet.org.uk/wp-content/uploads/Final_report.pdf [44] , [Accessed 1 December 2015]

PricewaterhouseCoopers, (2012), Digital Efficiency Report, https://www.gov.uk/government/publications/digital-efficiency-report/digital-efficiency-report [45], [Accessed 1 December 2015]

RTIRC, (2015), Regional Telecommunications Independent Review Committee, *2015 Regional Telecommunications Review*, Canberra, Commonwealth of Australia, http://rtirc.gov.au/ [46], [Accessed 1 December 2015]

SACOSS, (2015), *SACOSS Cost of Living Update No. 22 March Quarter 2015,* South Australian Council of Social Service (SACOSS), Unley, South Australia, http://www.sacoss.org.au/new-report-calls-concession-re-think-telecommunications [47], [Accessed 1 December 2015]

Telstra, (2015), Telstra Air, Telstra, https://www.telstra.com.au/broadband/telstra-air [48], [Accessed 1 December 2015]

Vanston, L.K., Hodges, R.L., (2008), Forecasts for the US Telecommunications Network, Telektronikk 3 / 4.2008, pp. 18-28, http://www.tfi.com/pubs/w/pdf/telektronikk_telecom.pdf [49], [Accessed 1 December 2015]

Wilson, I., Goggin, G., (1993), Reforming Universal Service: the Future of Consumer Access and Equity in Australian Telecommunications, Consumers' Telecommunications Network, Sydney.
Article PDF:
45-428-1-ce.pdf [50]

---


**Cite this article as:**

Mark Gregory. 2015. *The Rationale for Universal Access to Digital Services*. ajtde, Vol 3, No 4, Article 45. http://doi.org/10.18080/ajtde.v3n4.45 [52]. Published by Telecommunications Association Inc. ABN 34 732 327 053. https://telsoc.org [53]

---

Universal Access to Digital Services [54]
Universal Service Obligation [55]
broadband policy [56]
NBN [57]
USO [58]

---

[41] http://www.nbnco.com.au/content/dam/nbnco/documents/glossary.pdf
[42] http://www.nbnco.com.au/corporate-information/about-nbn-co/corporate-plan/corporate-plan.html
[43] http://ci-journal.net/index.php/ciej/article/view/639/582
[44] http://parliamentandinternet.org.uk/wp-content/uploads/Final_report.pdf
[45] https://www.gov.uk/government/publications/digital-efficiency-report/digital-efficiency-report
[46] http://rtirc.gov.au/
[47] http://www.sacoss.org.au/new-report-calls-concession-re-think-telecommunications
[48] https://www.telstra.com.au/broadband/telstra-air
[49] http://www.tfi.com/pubs/w/pdf/telektronikk_telecom.pdf
[50] https://telsoc.org/sites/default/files/tja/pdf/45-428-1-ce.pdf
[51] https://telsoc.org/copyright
[52] http://doi.org/10.18080/ajtde.v3n4.45
[53] https://telsoc.org
[54] https://telsoc.org/topics/universal-access-digital-services
[55] https://telsoc.org/topics/universal-service-obligation
[56] https://telsoc.org/topics/broadband-policy
[57] https://telsoc.org/taxonomy/term/36
[58] https://telsoc.org/topics/uso