

Universal Service: The trends, opportunities and best practices for universal access to broadband services

Andrew Dymond
Managing Director,
Intelecon Research & Consultancy Ltd.,
Vancouver BC, Canada

Abstract

This paper provides a review of international policies and strategies for ICT universal access and service (UAS), and how broadband is increasingly featured in them. It also reviews the opportunities for policy makers and regulators to leverage various developments in technology and service convergence for national and regional benefit.

The creative and efficient use of 3G and 4G frequency allocations are providing the opportunity to by-pass expensive wired solutions to enable mobile and alternative infrastructure providers to reach rural areas with voice and broadband Internet access more rapidly.

The task for policy makers and regulators is to develop a decisive strategy that leverages technology advances and competitive market forces in order to ensure a ubiquitous broadband service in support of national ICT Strategy. However, there may be overlapping or even competing policies and objectives at work and so the ability to establish a lead organization and to create synergies will be essential for successful implementation.

Trends are evaluated and country examples cited to enable the reader to assess the possibilities for UAS policy to become a tool for meeting broadband and advanced ICT and digital inclusion targets in difficult-to-reach areas.

1 Introduction

Early developments in national universal access and service (UAS) targeted public and private access to basic voice telephony services. As these programs reached their potential and total “universal” service coverage became close to reality in many places, policy makers turned their focus towards affordable high speed Internet (broadband) access. Broadband is increasingly regarded as being central to the development of an information and knowledge-based society able to leverage information and communications technology (ICT) for national development and achieving “digital inclusion” across the spectrum including remote regional and rural areas.

Many advanced countries with mature markets have already moved to include broadband as a universal service, exemplified by the broadband plans of Australia and the United Kingdom¹. In South Korea, broadband services are already universal, and in others – such as Finland and Spain – universal broadband is to become a citizens’ legal right.

Other countries, including many developing and emerging markets, are moving to achieve universal broadband on a national scale, regardless of whether that goal is stated in law, or by using policies focused on rural areas and underserved groups. Leading policy makers are maximizing market competition through stable and efficient mechanisms and expanding service coverage as much as possible with minimal government intervention.²

Intervention is occurring in those countries who have recognized the importance of broadband access (including most many countries in Europe, the United States, Chile, Korea, Japan, Malaysia, Saudi Arabia and Gulf countries, as well as India, Pakistan and other developing countries). These countries have modified, or are in the process of modifying UAS frameworks to include the provision of broadband services in rural areas.³ Others, such as Australia, Canada, and New Zealand⁴ are funding or providing seed money for broadband expansion through a distinct program run by a government department.

Technological advancements, particularly with wireless and especially mobile products and applications, continue to allow for a rapid dispersion of broadband-capable services in areas previously inaccessible – including some of the most remote regions on the planet. These advancements, when combined with market forces and smart regulatory practices, should allow for broadband proliferation and penetration on an accelerating scale.

2 Universal Service – an international perspective

2.1 History and background

National policies promoting universal access to telephony services have been around for decades. The earliest programs, centred on fixed line incumbent operators ensuring that, in addition to expanding the reach of their copper line networks to homes and businesses, there were sufficient numbers of public payphones available. The traditional English village phone box is a classic example, but phone booths became commonplace in most emerging markets also.

As the 1990s witnessed an explosion in the demand for and use of telephony - brought on mainly by market liberalization and technical advances - these very basic access programs became more sophisticated, and developing nations such as Peru and Chile made notable advancements by promoting access centres that allowed users to easily⁵ access a public telephone. There were

¹ See the Australian Broadband Guarantee and Digital Britain

² “Building broadband: Strategies and policies for the developing world” - Kim, Kelly and Raja, World Bank, Jan 2010

³ “World Telecommunication/ICT Development Report 2010: Monitoring The WSIS Targets – A mid-term review”

⁴ See Broadband Canada: Connecting Rural Canadians and New Zealand’s Ultra-fast Broadband Initiative

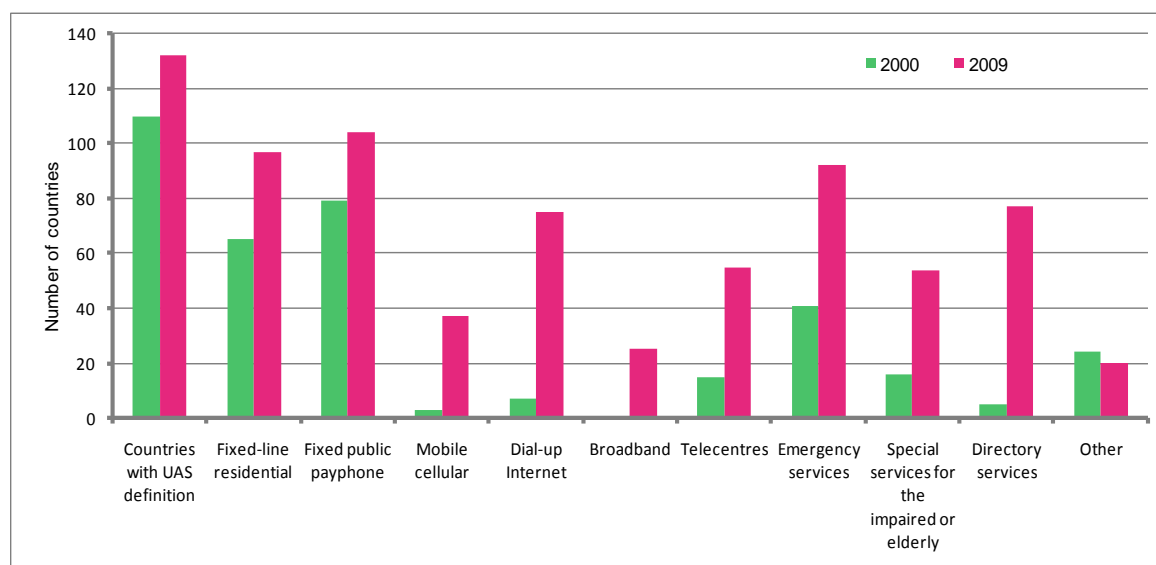
⁵ the concept of “easily” differs depending on the country involved. For example, in Mongolia a 20 km horseback or motorbike journey would be on the maximum end of “easy”.

usually other related services on offer at these centres, such as faxing, word processing and printing opportunities, as well as food and drink. Then the concept of the cybercafé was born. Still other countries used individual “phone ladies” who would offer a roaming telephony option, such as in Bangladesh⁶. But the concept of phone ladies, or phone people, later known as “village phones” was also transplanted to African countries such as Uganda, Rwanda and Nigeria, and more generically to countless other countries.

Due to the ever-expanding reach of telephony services brought on increasingly by mobile, and the clear preference of users (and potential users) to have their own private phone, most national policies were augmented over the past decade to include universal service provisions so that the telephone could be accessed from within the home and not simply from within an “easy” distance of home. Ever more the idea of the telephone as a user right - or as a basic utility - took hold. And with a private telephone connection, the possibility for a basic private internet service followed.

To keep pace with developments and provide equal opportunity for all citizens, many regulators began re-examining traditional UAS obligations. In 2000, there were 110 countries with a definition of UAS, and this increased to 132 in 2009. But importantly, 101 of these have now included internet access as part of the UAS definition, 25 of which are at broadband, as illustrated in Figure 1 below.⁷

Figure 1: Country UAS Policy Inclusion



Source: ITU World Telecommunications / ICT Regulatory Database

With the typical household willing to spend up to 5%⁸ of their income on ICT services, greater competition in terms of networks and services, and cheaper and more adaptable technologies available, the roll-out of telephony services has been spectacular - and this continues today. The vast majority of this growth has occurred via mobile communications.

The conditions were often so favourable for the spread of telecommunications services that subsidies offered by universal access or universal service funds (USFs) expected to be required for their deployment weren't needed to the extent thought necessary— at times because the cost estimates were created for more expensive fixed-line solutions. For instance, several competitive subsidy programs (auctions) established under USFs for rolling out services that used a lowest-bid system saw operators bidding often less than half of the “reserve price” , or even \$ zero, for

⁶ As with the Grameen project made popular in South Asia; the vast majority being women.

⁷ "ICT Regulatory News", May 2010, ITU.

⁸ In demand studies carried out by Intelcon around the world, and through analysis of household expenditure data, 5% is even a minimum in some developing countries where the opportunity cost of having no access to ICT is high.

the right to roll out services in designated areas⁹. In these situations, the lure of being “first in” to an area or of securing (or protecting) valuable frequency licenses was great.

2.2 Trend towards broadband

Leading on from the expansion of telephony and basic Internet services, the idea of universal broadband service as a user right is becoming a reality in more developed nations and is being expressed in national policies, and developing countries are wishing to follow suit. This is because it is commonly thought of as essential to the collective wellbeing of a nation as it is fundamental to economic development and has broad applications for political, educational, and sociological purposes. So broadband may be viewed as a general-purpose utility that influences the way people communicate, seek entertainment, conduct business, interact with governments, and educate and inform themselves. Certainly the correlations made between ICT take-up and wider economic growth and diversity are well documented. An American example is that the National Broadband Plan was included in The American Recovery and Reinvestment Act of 2009.

Building upon the idea of connectivity as a user right - and with building public scrutiny, international comparisons and public expectations - many policy makers took the next logical step and built Internet and broadband connectivity on to the existing national universal service programs. Other national policies merged digital access (broadband) programs with universal service objectives.

In 2000 there were zero countries with a *mandate* to make broadband a part of a universal service policy, while in 2010 there are at least 25. Of these, in the several countries where Intelcon has helped to shape UAS and USF policy since year 2000¹⁰, the subsidized implementation of broadband points of presence, public access centres and/or school connectivity at greater than 256 Kbps in district centres which were deemed to have the greatest possibility of developing demand for broadband services, have been part of UAS strategy.

It's more about how you use it

One issue that has not been, and is likely not going to be generally accepted any time soon, is determining a single definition of broadband. Most often, broadband is characterized by download speeds in an optimised test environment, and different governments and organizations have set minimum figures ranging from “more than” 64 Kb/s to in excess of 5Mb/s¹¹. Historically, details such as contention ratios, upload speeds, or guaranteed minimum throughputs were not included; however it is becoming more common to see broadband definitions including upload and download speeds, as well as certain performance measurement criteria.

What is interesting is that the capabilities resulting from the broadband connection are ultimately what is of greatest importance for most people; the ability to watch video streaming, use voice over internet (VOIP) applications, and transfer work files and audio-visual files with some ease is what matters. Generally this requires at least a reliable and dedicated 512 Kb/s connection.

Regardless of the quality of connection (speed) delivered at any given time and in a wide array of environments, it is the proliferation of wireless technologies, both fixed and mobile, and applications that have driven and will continue to push along broadband developments. Policy makers are consequently on the hot seat to ensure that this growth is enabled and can be encouraged. Key issues such as spectrum allocation, licensing, infrastructure sharing, technical standards, interconnection rules and termination rates all come into play.

As in the case of telephony before it, regulators and policy makers also need to take a technology or service neutral (unified) licensing approach if they wish to reach into rural areas – i.e., they

⁹ However, there were also many cases of subsidies collected and not used for the intended purpose that would have produced even faster roll out.

¹⁰ Uganda, Nigeria, Mozambique, Malawi, Botswana, Mongolia, Peru, Russia.

¹¹ 256Kb/s and 512 Kb/s remain the most common figures, but the trend is certainly upward. 64 Kb/s is for Peru and 5 Mb/s is for New Zealand

must make provision for both fixed and mobile network services (increasingly mobile) to be the bearer of remote area broadband solutions.

Making use of spectrum

In many countries, television signals are being migrated over to digital signals exclusively and this process frees spectrum in the 700MHz and 800MHz range which had been designated for analogue television signals. The advantage of this lower range is that the signal is reached over longer geographic distances and is therefore useful in terms of maximizing (rural) coverage.

The 400/450 MHz spectrum range also offers operators the potential to deliver basic high-speed wireless broadband services in rural and underserved areas. Countries with commercial Code Division Multiple Access (CDMA) 450MHz networks capable of broadband are: Belarus, Czech Republic, Estonia, Georgia, Germany, Hungary, Indonesia, Kyrgyzstan, Latvia, Mongolia, Portugal, Romania, Russia, Tajikistan, Tanzania, Ukraine, Uzbekistan. An added incentive is that the narrowness of the transmission bandwidth means that licence fees may be lower, allowing licensees to keep costs low for end-users.¹²

Similarly, in a report entitled "Prospects for UMTS900: status review and outlook", 3G networks using 900MHz spectrum previously allocated for 2G services have already been successfully rolled out in Finland, Iceland, Australia, New Zealand, Thailand and Venezuela.¹³ Saudi Arabia also has approved the use of UMTS900 on its UAS strategy to bring 512 Kbps to all rural areas; this resulted from all bidders in the first competitive USF subsidy roll-outs proposing this technology and requesting its approval as the most cost-effective for the purpose.

Meanwhile in Europe, steps are being taken to:

- attain specific targets for wireless broadband and to ensure availability of spectrum designated for this purpose;
- mandate the freeing of the 800 MHz digital dividend band by 2013;
- ensure coverage of rural areas and access for less favoured citizens; and
- make certain bands tradable and ensure spectrum for ubiquitous satellite access.¹⁴

Therefore we see that the availability and siphoning off of the lower spectrum ranges - often for use in rural broadband connectivity - has already become a reality in many countries. This clever targeting of resource enables operators to achieve a base station coverage radius for 3G which mimics the typical rural base station design radius for 2G voice services (10-15 Km) in areas where coverage is more important than capacity. This must continue if universal access to broadband is to become a reality.

3 UAS & Broadband Policy Integration

Since broadband is increasingly demanded and expected in both developed and in developing countries - as well as in urban and rural areas - policy makers and regulators are wise to adopt a collective and considered approach towards its proliferation and adoption. This is more easily said than done though, as there may be legacy ICT development policies and programs (let alone organizations) in place that would need to interact with new, often overarching national strategies.

In those countries where there is a common objective in place to make broadband available nationwide¹⁵ (i.e., "universally"), the driving policy is usually rooted in either the established UAS obligation or in a national ICT/digital strategy, or both. Certainly in all but the least developed

¹² 21 May 2010 – Business Monitor International

¹³ Analysys Mason 2009

¹⁴ Article 6 Spectrum for wireless broadband communications, September 20, 2010 Decision Of The European Parliament And Of The Council

¹⁵ South Korea is the only country to have universal broadband coverage at present

countries, the concepts of UAS and universal broadband availability are now intrinsically linked. Further, many policies related to education, health, government service provision, infrastructure development, tourism, etc. depend upon broadband and may even include specific plans to promote it. So almost automatically we can witness a plethora of policies promoting broadband and relying upon its uptake. This situation tends to generate a long list of stakeholders with different budgets, timelines, political motivations, and even priorities.

In order to properly channel the inputs and activities of these stakeholders, it is important for each country to designate a single high-level body to spearhead broadband penetration. This may be in the form of a primary government department (as with the Federal Ministry of Economics and Technology in Germany), a government-sponsored agency with a specific UAS mandate (as with the Infocomm Development Authority of Singapore (IDA)), or a special broadband executive agency (as with Program Banda Larga Popular in Brazil).

It may be that two or more organizations with similar mandates must work together. In such cases, there should be clear lines of authority and accountability.

Wider strategies

Increasingly countries are developing comprehensive strategies that address how ICTs transform our lives. While called national ICT plans or policies in the past, more and more are called *digital strategies* or similar, acknowledging the fact that it is not only ICTs, but a whole digital world, including access to broadband telecommunications services. Examples are:

- UK: Digital Britain (2010)
- EU: Digital Agenda for Europe (2010)
- Australia: Australia’s Digital Economy – Future Directions (2009)
- Norway: eNorway 2009 – The Digital Leap (2009)
- New Zealand: Digital Strategy 2.0 (2008)
- Chile: Digital Development Strategy 2007-2012 (2007)

An ICT/Digital Strategy’s main areas of concern can be very wide, i.e., much broader than the traditional concerns of UAS policy, including an array of legislation, content creation, e-Government initiatives, standards, cyber security, research/innovation, and skills development. Table 1 summarizes the specific sectors of focus in 13 sample countries’ and regional ICT/Digital Strategy initiatives.

Table 1: Summary of ICT / Digital Strategy sectors

Common Topics Addressed in ICT Strategies								
Country	Access/ Inclusion/ Infrastructure	Legislative/ Regulatory Framework	Content Creation	eGovernment	Interoperability/ Standards	Security / Cyber- crime	Research/ Innovation	Skills/ Training/ Education
Australia	•	•	•	•		•	•	•
Chile	•	•		•	•	•	•	•
Egypt	•	•	•	•		•	•	•
EU	•	•	•	•	•	•	•	•
Kenya	•	•	•	•	•	•	•	•
Malaysia	•	•	•		•	•		•
Netherlands	•	•	•	•	•	•	•	•
New Zealand	•	•	•	•	•	•	•	•
Norway	•	•		•	•	•	•	•
Seychelles	•	•	•	•			•	•
Singapore	•	•	•	•	•	•	•	•
South Korea	•		•	•	•	•	•	•
UK	•	•	•	•	•	•	•	•

Source: Intelcon research for Philippines Government

A further distinctive of a national ICT/Digital Strategy is that it cannot be developed by a single agency in isolation, for it is a cross-cutting strategy. However, without the proper focus, mandate, authority and skill to spearhead universal access to broadband programs – and to channel finance to the wide array of associated projects – countries will likely grapple with many of the strains of a disjointed approach, such as: duplication of effort, political in-fighting, budget limitations, competing priorities, wasted efforts and budgets, poor accountability and performance valuations, and dilution of talent, to name but a few.¹⁶

Therefore the organization chosen to carry out the strategy must be sufficiently equipped and empowered to effect change and to direct and lead stakeholders. In most cases, this means merging the capabilities and skills, if not the organizations, of senior Government with UAS funding agencies, such as a USF.

Finding synergy between ICT/Digital Strategy and UAS

As can be seen from the Table 1, Access/Inclusion/Infrastructure always plays a key part in the wider ICT (digital) strategy. Given this situation, it would make sense to involve an established organization that has already had specific, related experience and success with the design and/or implementation of UAS initiatives – i.e., the USF Administration - where this exists. Therefore, where a broader national ICT/digital strategy (or equivalent program) is in place, a part of this strategy should be to specifically enable an established UAS organization, such as the USF, to play a leading partnership role in driving broadband access and inclusion projects. Reasons in favour of this approach include:

- Systems are already in place (e.g., financial, monitoring, reporting);
- Subsidy methods are established that can be leveraged to promote expansion;
- Skilled people are in place with specific qualities;
- Political connections have been established;
- A reputation has been established and the organization is widely known, including having credibility for independence and transparency in tendering processes;
- The focus is sharp as there are fewer competing priorities (so the mandate and accountability are clear);
- Broadband is a natural progression for UAS activities.

One enhancement which needs to be added to the UAS or USF administration's repertoire for broadband is the adaptation of its existing methodologies to include a wider range of implementation modalities – e.g., public-private partnerships - in project financing. However, the principles and skills related to the processes for tendering, transparency and least cost solutions are still essential ingredients to the wider implementation modalities expected in broadband.

4 Conclusions

A common trend is for ever-more progressive communications services to be made available in rural areas, where there are less advantaged households. What started as public access points to basic voice telephony progressed to include internet access (and related computer services) and then to assuring availability of private telecommunication services to the home. Lately, these basic telephony services are being joined, if not overtaken, by broadband, and the UAS mandate perceived as having to change with time and need.

Wireless and particularly mobile technologies and applications have led the way in terms of driving the proliferation of services and availability, and due mainly to lower costs and easier roll-out, it is expected that this will continue. However, in order for this expansion to continue, there must be a concerted effort to manage the scarce resource that is spectrum. We have seen that policy makers are using the lower frequency ranges to good effect already and that a dedicated policy and regulatory focus has been placed on freeing up and using practical frequency ranges.

¹⁶ The Philippines is reviewing its beleaguered communications agency (CICT) with a view to transforming it into a Ministry with augmented powers and mandate.

There are other related communication policies and regulations, including financing sources such as USFs, which can also be leveraged to promote broadband expansion.

What is not so much a definite or established trend is where the broadband plan rests and who is tasked with its implementation. We have seen that a national broadband program may be an extension of the UAS implementing agency, or it may sit elsewhere – perhaps in a Ministry or within a new agency specifically created for broadband expansion. Likewise, the policies and objectives that are designed to push the reach and use of broadband may be duplicitous, overlapping, competing, or even entirely isolated from one to another. This could be wasteful of energy and counter-productive and is a challenge for both policy makers and regulators alike.

Those countries with the clearest lines of accountability and most defined mandates - with the accountability at the highest level of Government (Prime Minister or President) - are likely to have success. On the other hand, the organization often with the most experience of implementing UAS projects, namely the USF, though not necessarily answerable to the highest level of authority (but typically having an important degree of independence under the regulator), may have also built up considerable credibility. Thus results will likely be attained faster and with lasting benefit where an overarching ICT strategy is able to harness the potential of such a proven UAS organization, and empower it to work in harmony with the senior ICT/Digital Strategy agency.

Andrew Dymond is a senior telecommunications economist, market & policy strategist and a partner in the consulting firm Intelecon Research & Consultancy Ltd., Vancouver, Canada. Mr. Dymond is a recognised leading world expert in Universal Access and Service, the commercialisation and regulation of rural ICT and Broadband services, as well as the development of Universal Access and Service policies and funding mechanisms. He holds a BSc degree in engineering and a Masters in Economics. He has also worked as Director International for Deloitte Consulting in Vancouver, and Manager of Economic Analysis for BT Telconsult, London, UK.