Broadband for the Bush Alliance

Urban Based Support for Rural and Remote Australian Telecommunications

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About the Alliance
The Broadband for the Bush Alliance (B4BA) is a group of organisations that are committed to the digital inclusion of remote and rural Australia. The Alliance brings together a range of stakeholders with expertise in communications, remote service delivery, and community engagement. It has published a number of policy documents¹.

1. Overview

Ever since the introduction of long distance telegraphy to Colonial Australia, those living working and travelling in rural and remote areas have benefitted greatly from numerous telecommunications infrastructure projects largely funded from urban sources. This paper describes examples of such initiatives.

The projects we consider fall into two broad categories: -

A. Projects that variously facilitate urban-to-urban, rural-to-rural, urban-to-rural and in certain instances international telecommunications.

B. Projects that primarily facilitate rural-to-rural and urban-to-rural telecommunications.

For both categories the large scales of expenditure required have necessarily mainly been borne by the urban service users, and, when government subsidies have been needed, by urban taxpayers. Thus the examples confirm that rural Australians have effectively benefitted from urban-based support for the nation's telecommunications development.

Until the privatization of Telstra commenced in 1997, the history of Australian telecommunications was largely one of government ownership and control. In colonial times, the great advantages offered firstly by telegraphy and later by telephony introduced real means for countering the acute isolation and physical challenges imposed by a vast continent sparsely populated from European perspectives (Refs 1,2). This overriding importance brought all colonial governments to assign responsibility for the new services to their respective existing Post Office Departments.

With Federation in 1901, similar sentiments made it expedient to combine the then colonial Post Office departments into a single national government owned entity, the Postmaster Generals Department (PMG). Thus government ownership continued to facilitate the expansion of the three service arms nationally.

As a number of the cases described below indicate, the PMG department adopted practices that often effectively offset higher costs incurred servicing rural telephone subscribers against earnings accrued from the more numerous urban subscriber base\(^2\). These practices served both to support the national interest and to partially offset costs for rural subscribers, such as higher overall telephone service fees incurred through their greater usage of trunk-line calls.

Following the division of the PMG into the Australian Post Office and Telecom Australia in 1975, Telecom inherited responsibility for universal service provision, then known as the Community Service Obligation (CSO) and later to become the Universal Service Obligation (USO). The annual costs were first revealed as $200 M in Telecom’s 1979-80 report.

In 1992 when partial privatization commenced with the licensing of Optus and Vodafone and Telecom became Telstra, USO costs were met by a levy on all three network operators assessed in proportion to their share of traffic (Ref. 3). Then following the introduction of full competition via the Telecommunications Act of 1997, the various carriers were assigned responsibility for USO services by the Federal Minister.

Most recently the Telecommunications Universal Service Management Authority (TUSMA) was set up as a new government body for the continued administration of the USO.

Early in the present century rapidly growing internet and social media communications demand brought rural and remote broadband service subsidization.

\(^2\) As Corner (Ref. 3) quotes from Moyal (Ref. 4): "following Federation “the PMG’s commissioners recognized that the country’s communication system should be treated as a complete financial proposition in which those parts of the service that made a profit should sustain and cross-fertilize those that did not”.
In 2007 this was provided through the so-called Australian Broadband Guarantee (ABG) programme. This essentially satellite-based service and its successor, the fully government owned National Broadband Network (NBN) Company Interim Satellite Service (ISS) have enabled many beyond the range of terrestrial networks to secure affordable fixed broadband communications. Recent purchases of two new high capacity Australian Satellites by NBN Co for $620 M, scheduled for launching in 2015 and 2017 respectively, exemplifies continuing Federal government support of modern remote and regional communications.

In summary, urban subsidization of telecommunications for those in rural and remote areas has existed as an integral practice from the colonial era. While not always explicitly visible, considerations based on demography and the nature of many relevant developments clearly show the practice has taken place inherently and continuously through the many decades where government monopoly managed these services. Privatization introduced a new era where taxpayer-funded government subsidization has become explicit, newsworthy and visible. Section 2 below describes examples from both of these periods.

2. Examples

(i) Long-Distance Telegraphic Systems - (Category A)

Long-Distance Telegraph systems funded by colonial governments from the mid 19th century, not only linked established cities and regional centers, but also provided a major stimulus for the development of rural and remote areas through which the lines passed (Ref. 1).

Some major Long-Distance line completion dates are as follows:

- 1858 - Melbourne - Sydney and Melbourne - Adelaide
- 1861 - Brisbane - Sydney and 2nd line Melbourne - Adelaide
- 1867 - Adelaide - Sydney direct line
- 1872 - Port Augusta - Port Darwin - ‘The Overland Telegraph’
- 1877 - Perth - Adelaide

All of these projects were of huge importance. However, The Overland Telegraph, traversing the continent from North to South and enabling overseas communications via undersea cable from Darwin to Java, was the most outstanding individual achievement. Requiring eleven telegraph repeater stations, it caused settlements and towns to come into being in the remotest parts of the continent, including Alice Springs.

(ii) Rural Telephones - (Category B)

Prior to and for two decades after Federation, telephone networks were essentially installed locally in cities and towns. So they were isolated from one another (Ref. 1).

However the invention of the thermionic vacuum tube made telephonic repeaters, and hence long-distance trunk lines possible. These permitted the numerous individual local networks to be electrically combined and so accelerated service growth.

In many small country towns, exchange-serving-areas and hence maximum local-line lengths were necessarily much greater than in larger population centers. In other words, the number of premises passed per mile of rural telephone line was far lower than in urban areas. The difference was accentuated further by the practice of incorporating so-called Part Privately Erected (PPE) lines in rural exchange serving areas³.

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³ PPE lines were introduced to extend services to rural subscribers located far from local rural telephone exchanges. The lines consisted of a PMG section constructed from the local telephone exchange out to the prescribed maximum length, which connected to a privately erected section extending to the subscribers.
Consequently with a uniform national local-call fee and line capital and maintenance costs approximately proportional to line length, many rural subscribers were inherently subsidized by their urban counterparts.

(iii) Rural Automatic Exchanges (RAXs) - (Category B)

As Moynihan (Ref. 5) reports, automatic telephony was introduced early in the 20th century with exchanges in Perth, Sydney, Geelong, and Melbourne trialled and installed prior to WWI. However, although the obvious advantages of exchange automation in populated centers grew with increasing subscriber numbers, and though some special small rural automatic exchanges (RAXs) were being trialled by the mid 1920s, the depression, the advent of WWII and inherent technical factors significantly delayed their widespread use.

News reports indicate that following World War II the PMG Department then gave some priority to RAX provisioning (Refs 6, 7). However the task was obviously a very large one. Thus unlike some of our other examples, the large RAX provisioning programme took decades to complete, with the last manual exchange reportedly being converted early in the 1990s (Ref. 1).

The advantages of the RAX facilities were long lasting. They brought the convenience speed and privacy inherent with automatic telephones. Also they importantly ensured 24 hour service availability for subscribers previously dependent on the opening hours of typical small manual rural exchanges.

Furthermore, one unforeseen advantage later emerged from an inherent initial limitation. For in comparison to their older manual counterparts, automatic phones could only operate on relatively short lines, which necessitated greater numbers of RAX installations. However with the introduction of Digital Subscriber Line systems for broadband services in the late 1990s, RAX installations could be DSL enabled for the provision of good high-digital rates possible on the shorter RAX lines.

(iv) Digital Radio Concentrator System (DRCS) - (Category B)

The DRCS became a major part of Telecom Australia’s $400M National and Remote Area Programme launched during 1980s (Ref. 8) with the aim to extend automatic telecommunications services for large distances beyond the boundaries of the Public Switched Telephone Network (PSTN).

Originating from concepts developed by Telecom’s Research Laboratories, the system provides for maximum terrestrial microwave routes of around 600 km achieved with up to 13 repeater sites. Customers received access to essentially all types of PSTN automatic exchange based services.

The programme was scaled to install approximately 10,000 subscriber sites connected to the network via around 850 digital terrestrial microwave radio repeater stations by 1990.

NEC Australia became the successful equipment tenderer.

In 1999 Telstra introduced its High Capacity Radio Concentrator (HCRC) system having upgraded transmission capabilities. The upgraded network continues to play a central role in servicing many of our remotest telecommunications users.

Like the DRCS, the HCRC system delivers services qualifying for USO delivery funding. Consequently both represent prominent examples of urban based support for rural and remote telecommunications.

(v) Ngaanyatjarra Lands Telecommunications Project - (Category B)

premises. The long range capability of the magneto telephones employed with manual exchanges permitted PPE lines to extend for great distances.
We include this project described in detail by Featherstone (Ref. 9) as it is unique amongst the others listed here.

For it shows how the Federal and Western Australian State governments, the Shire of Ngaanyatjarra and Ngaanyatjarra Council and the successful tenderer Telstra jointly funded major telecommunications upgrades to one of the country’s remotest community groups in the Western Desert region of Western Australia. The project was known as the Ngaanyatjarra Lands Telecommunications Project (NLTP).

The Ngaanyatjarra region, covering 188,000 square km, was largest native title determination to 2005 in WA, with a regional population of approximately 2000 living in 12 remote indigenous communities. The region contained no pastoral or large-scale mining activity.

The contract secured by Telstra in 2006 included provision for: -
(a) Optic-fibre backhaul network interconnecting the six main central communities.
(b) Broadband ITERRA satellite links for the other six communities - to be effected as Stage II.
(c) Exchange upgrades for standard telephone, broadband Digital Subscriber Line, ISDN and Virtual Private Network (VPN) services.
(d) WiFi last mile transmission distribution for the six ITERRA linked communities.

This example demonstrates a mixture of urban subsidization and multi-stakeholder investment to achieve a commercially viable business model to expand access to broadband and telecommunications services.

It is noteworthy that this project provided the backbone infrastructure to enable extension of mobile coverage to much of the Ngaanyatjarra Lands (see next example) – a project that was once again made possible through multi-stakeholder investment.

(vi) Rural & Remote Cellular Mobile - (Category B)

As the comprehensive 2011-2012 Sinclair report on regional telecommunications (Ref. 10) concluded, cellular mobile phone networks had by that time essentially grown to service all areas capable of supporting adequate commercial returns. Hence further identified much needed coverage expansion would depend on government support.

The Federal government of the day was perceived to be totally occupied with launching the National Broadband Network (NBN) intended for fixed services exclusively. Thus the governments of Western Australia and the Northern Territory each initiated projects, jointly funded with Telstra, for rural cellular mobile expansion in their respective jurisdictions.

It is reported that the Western Australian project will increase mobile coverage in the State by 22% (Ref. 11). The Northern Territory project is scheduled to extend cellular mobile services to eight new locations and fixed broadband to six communities (Ref. 12).

In the context of the present Forum it is relevant to note that in 2013 B4BA released a white paper (Ref. 13) advocating measures for the cost effective expansion of cellular mobile in regional and remote areas. The paper was also later published in more detailed form (Ref. 14).

Since these developments the new Federal government has committed $100 M for the further expansion of cellular mobile services in all states and territories. Public submissions responding to a consequent government discussion paper are under consideration at the time of writing.
3. Conclusions

A clear overall conclusion to be drawn from the above considerations, is that throughout its history, Australian telecommunications has been a field where urban support has brought continual and often crucially important benefits for those in rural and remote areas. The specific identification of the CSO and later USO regimes during the long early period of full government control, illustrates the level of responsibility then undertaken for provisioning far beyond cities and towns.

The relatively new privatization era requiring that tax-payer-funded government subsidies be visible, has heightened the need for informed independent advocacy. For the planning of relevant infrastructure expansions, previously conducted professionally within the PMG department or Telecom for instance, must now proceed much more publicly with greater exposure to political pressures. With an increased range of delivery technologies and service types, the role of independent advocacy organizations capable of delivering well supported informed analyses is therefore one of growing special importance.

4. References


