# Chapter 2

# Voice and data services

2.1   The Committee's terms of reference require it to make an assessment of the capacity of the Australian telecommunications network to deliver adequate services to all Australians.  In this chapter the Committee examines the adequacy of the network to deliver voice and data services and the impediments inherent in the network which limit the services which can be delivered to customers.  In later chapters of the Report the Committee examines other impediments to the delivery of services such as network faults and maintenance issues, and various government access programs designed to improve the availability of services.

2.2   The Australian telecommunications network was originally designed and developed for voice telephony.  The Committee received relatively few complaints about the quality and availability of voice services.  Most of the concerns relating to voice services referred to a loss of service due to faults and the general state of the network, or to the inability to obtain a connection because of the use of pair gain systems.

2.3   Data services were initially developed and used mainly by universities, governments and large businesses.  Information technology and data transmission services have grown to become one of the cornerstones for improving business efficiency and economic development.  With the development of the Internet the demand for data services by small business and consumers has rapidly expanded.  In this chapter the Committee discusses the extent to which Australians have reasonable, comparable and equitable access to services such as the Internet, particular through broadband services.

2.4   It must be stressed that the Committee took evidence over a period of 10 months and in the interim there was progress made across several fronts by Telstra and the other telecommunications infrastructure providers which may bring into question the continuing validity of witnesses' evidence.  In particular, Telstra has in place several ongoing programs, involving both cable replacement and continuous augmentation of its fixed and mobile networks in response to increased demand and competitive pressure.  The evidence cited below may, therefore, have been overtaken by events.

2.5   Accordingly, the Committee has sought to identify key trends on which it can make judgements on the matters referred to it, rather than basing its conclusions on individual incidents or claims.

## Fixed line networks

### Network Capacity

2.6   The key source of evidence on the adequacy of Telstra's fixed line network came from representatives of the Communications, Electrical and Plumbing Union (CEPU),

the main union representing employees in the telecommunications industry, who gave evidence at several of the Committee's hearings across Australia. Given that the union's members are working in the field, undertaking repairs and related activities in relation to the fixed line network, the Committee gave their evidence particular weight. Their evidence was consistent: that the Telstra network is in poor condition and declining. Submissions from the various branches of the CEPU also referred to major cables which are full and for which no spare capacity exists and to the reduction in capital expenditure by Telstra.

2.7 It is not helpful to list here the litany of individual concerns raised with the Committee, many of which have no doubt since been fixed. As discussed in the Preface, Telstra made it clear to the Committee that it was closely monitoring the evidence being given to the Committee and that it was anxious to address complaints, especially those affecting individuals.

2.8 The number and range of systemic faults which constrain the network's capabilities were of greatest concern to the Committee, faults which will cost hundreds of millions of dollars to fix. These included faulty cables, the use of inferior pair gains technology, and systems which are liable to fail in heavy rainfall and from lightning strikes. These are discussed in detail below and in the next chapter.

2.9 It was not only the CEPU raising concerns about the state of the Telstra network. For example, King Island Council raised its concerns about continual line noise from electric fences, decaying lines, and cables well past their use by date.[1]

2.10 Poor or outdated telecommunications infrastructure can restrict the ability of communities to attract new businesses and employment to their area. This problem can be particularly significant for rural and regional areas seeking to attract new businesses and industries to their area. Break O'Day Council in Tasmania offered virtually free access to a council building in Fingal in order to attract businesses to the town. It received responses from two parties interested in setting up call centre type operations. Unfortunately it was found that the existing telephone network was unsuitable for their operations forcing those parties back to major centres such as Hobart and Launceston. The Council's submission said that:

> Poor telecommunication infrastructure was clearly the major contributing factor in this community being unable to secure new and long term employment opportunities in this instance.[2]

2.11 However, not all submitters were dissatisfied with the infrastructure used to provide their voice services. To quote just one example:

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1    King Island Council, Submission 19.

2    Break O'Day Council, Submission 11.

> As a rural subscriber to the telecommunications network it appears to me that the delivery of voice services is adequate, from an infrastructure point of view.[3]

## Dial-up Internet speeds

2.12 The most common method by which home users access the Internet is through the use of a modem over a standard telephone line. These modems normally have a maximum connection speed of 56 kbps which is adequate for browsing the Internet, but is generally considered too slow for interactive games, downloading music or video clips, or for business purposes. Although the number of dial up subscriptions is declining, at the end of September 2003 there were 4,522,000 subscriptions to dial-up services but only 690,000 subscriptions to other services.[4]

2.13 The area of greatest concern with dial-up access to the Internet is slow dial-up speeds. The Committee received evidence about this issue from a number of submitters:

> We are a progressive company based in Macksville and operate 3 separate sites including a new and used sales yard, a service, spares and bodybuilding shop and a home office. In total we have 10 voice lines, 3 modem lines, 2 fax lines as well as 7 mobile phones. We have recently found improvement in our sales yard with connection speed to the Internet but still have problems with connection speed from our Industrial Site to our sales yard. Due to limitations of available services and the exorbitant associated costs with other options, we currently have our sales yard dial in using terminal services to access programs at our main yard. The connection speed varies from 26k to 31k on a 56k modem. The average is around 28k. As you can appreciate this speed is quite slow when dialling into another system to access information.

> Our home office site, which is operated six days per week, has a maximum connection speed of 21k. The average connection speed is usually around 19k. This slow connection speed means that product updates cannot be downloaded because they time out, share trading is almost impossible because of the slow data exchange and we are limited in so many applications.[5]

2.14 The concerns seemed to be greatest in rural areas, particularly for farmers not living close to an exchange:[6]

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3    Ms Roslyn Joseph, Submission 32.

4    Australian Bureau of Statistics, *Internet Activity - September 2003*, Series 8153.0, p 5.

5    E-Nambucca Project Committee, Submission 66.

6    Guyra Shire Council, Submission 15; Parry Shire Council, Submission 23; Orana Regional Development Board, submission 42; Mr Frank Calabrese, Submission 63; South West Development Commission, Submission 144

> Anecdotal comments obtained during the community consultation indicated that farmers on properties distant from the telephone exchange could not achieve 14.4 kbps and were more likely to have 9.6 kbps and that the usage of dial-up for Internet access was not practical for the pursuit of commercial activities.[7]

> I would now like to talk about dial-up services within the region. The current prescribed minimum download of 19 kilobits per second in major population areas does exist in the region but is inadequate outside those centres. Download speeds can be as low as 4.8 kilobits per second, with implications for core Internet services such as e-banking and email. We have ad hoc evidence to suggest that around 3,000 to 4,000 households in the south-west cannot achieve the minimum national standard.[8]

2.15 While concerns about dial up speeds most often related to rural areas there was also criticism of services in urban areas:

> Telstra's performance in providing end-user communication circuits of sufficient quality for data and Internet services to domestic, small and medium businesses is unacceptable. At present, Telstra is unable to provide adequate dial-up data services to all of the Sydney Statistical District let alone regional, rural or remote areas.[9]118

> I experience a speed of between 12 kbps and 14. 4 kbps, which is hopeless. For example, you cannot download pictures, JPEG files take forever and even email is slow. It is just like subsistence surviving you cannot get any enhanced services whatsoever. You could not do anything with web sites or anything like that.[10]

2.16 Concerns about dial up speeds were also expressed by King Island Council. Telstra has been trialling a Wireless Local Loop on King Island as a cost effective means to address poor quality copper cabling. However, those connected to the service are restricted to a dial up Internet speed of a mere 14.4 kbps.[11]

2.17 The Committee also received evidence that the reason for low dial-up speeds often lay with the users and ISPs equipment, not with the line. The Committee was told about a joint venture between the Pilbara Development Commission and Telstra

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7    Ms Anita Iuretigh, Executive Officer, Warren-Blackwood Economic Alliance, Committee Hansard, 9 May 2003, p 602.

8    Mr Don Punch, Chief Executive Officer, South West Development Commission, Committee Hansard, 9 May 2003, p 616.

9    Ms Vicki Brooke and Mr Grahame Wilson, Submission 118, p 2.

10   Ms Vicki Brooke, Committee Hansard, 20 May 2003, p 784.

11   King Island Council, Submission 19.

Country Wide which was able to test consumers' lines and work out exactly where the problem with dial-up speed arose.  It showed that:

> In about 95 per cent of cases on our region it was not actually the line but the reconfiguration in the computer, which had in most cases been provided by the ISP, that was the issue.  So there was an incompatibility between the PC and the modem which was causing the deterioration in speed.[12]

> I understand from Telstra Country Wide that the Pilbara region now has the greatest proportion of customers that connect at 28.8 kilobits per second in the whole of non-metropolitan Western Australia.[13]

2.18  In its submission Telstra added that Internet speeds available via the PSTN vary greatly throughout Australia, depending upon a multitude of factors including the PC and modem being used, the quality of the local loop, and traffic congestion.[14]  It went on to observe that:

> It is widely assumed that dial up data speeds commonly approach 56kbps in metropolitan areas, while in rural and regional areas access speeds are too slow for effective use.  Both assumptions are wrong.  Speeds of 56kbps are virtually never achieved, regardless of where a consumer lives.  Moreover, Telstra conducted a review in June 2002 of actual data speeds its regional customers were obtaining, which indicated that 87 per cent of customers achieve speeds in excess of 28.8kbps, while in excess of 97 per cent of consumers achieve speeds in excess of 14.4kbps.

2.19  Telstra provided the Regional Telecommunications Inquiry with figures showing connection rates to Telstra's Big Pond Internet server.  These showed that the majority of users were connecting at speeds greater than 28.8 kbps and that only 2.64% of users were connecting at speeds slower than 19.2 kbps.  The Regional Telecommunications Inquiry report went on to note that these figures included the influence of incorrectly configured customer equipment and that 'it is likely that problems in the Telstra network are affecting well under one per cent of dial-up Internet use'.[15]

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12   Mr Mark Hainsworth, Senior Policy Officer, Policy Unit, Strategy and Legislation, Department of Local Government and Regional Development, Western Australia, Official Committee Hansard, 9 May 2003, 664.

13   ibid.

14   Telstra Corporation Limited, Submission 107, p 48.

15   Regional Telecommunications Inquiry, *Connecting Regional Australia*, p 154; the same data was provided to the Committee in Telstra's submission, Telstra Corporation Limited, Submission 107, p 49.

**Connection rates to Telstra's Big Pond Internet server, June 2002[16]**
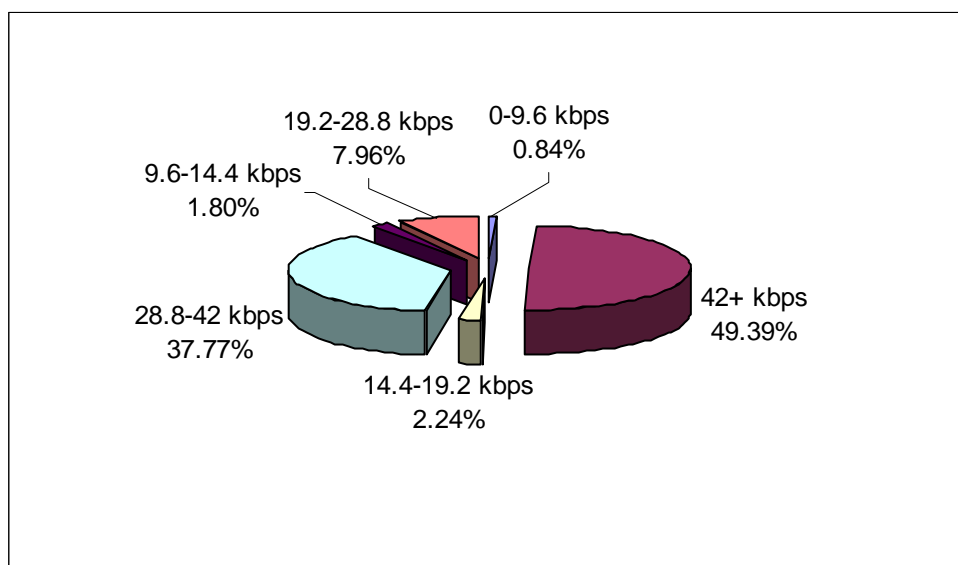


2.20 The figures provided by Telstra and reproduced by the Regional Telecommunications Inquiry only give an indication of the speeds at which those who are using dial-up connections to the Internet are connecting. They do not show what proportion of potential dial-up customers have abandoned efforts to access the Internet because low dial-up connection speeds make it impractical to use the Internet. The Regional Telecommunications Inquiry also appears to have overlooked the fact that the use of pair gain systems by Telstra significantly reduces that maximum dial-up speed for large numbers of users who may well feel that this represents a problem in the Telstra network.

2.21 The Internet Assistance Program[17] (IAP) was aimed at addressing concerns about low dial up speeds. However, the Regional Telecommunications Inquiry found that 37 per cent of its submissions noted concerns with dial-up Internet speeds and the quality of service provided. A submission to that inquiry showed that 82 per cent of survey respondents in one area of Western Australia were not aware of the IAP.[18]

2.22 Evidence given to the Committee continued to raise questions about the adequacy of the IAP:

> There are claims that there has been a steady improvement with dial-up services and their performance over recent years. It is arguable that mostly this is a result of consumers becoming more computer literate. More recently Internet difficulties have been assisted by the Internet Assistance

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16      Regional Telecommunications Inquiry, *Connecting Regional Australia*, p 154.

17      See Appendix 5 for details.

18      Regional Telecommunications Inquiry, *Connecting Regional Australia,* p 155.

Program (IAP) developed by the Department for Communications, Information Technology and the Arts. This initiative is welcome although consumers are still reporting great difficulties in regional and rural areas.[19]

2.23 In response to these concerns the Inquiry recommended that a licence condition be placed on Telstra that would require all Australians to be guaranteed dial-up Internet speeds, or equivalent throughput, over the Telstra fixed line network of at least 19.2kbps.[20] The Government responded to this recommendation by imposing a new licence condition on Telstra which replaces the existing IAP agreement. The Department of Communications, Information Technology and the Arts states that:

> The Telecommunications Service Inquiry (TSI) and the RTI identified that 19.2 kbps was an adequate speed for basic Internet browsing and email that could be delivered at a reasonable cost to the community.[21]

2.24 The evidence received by the Committee frequently questioned the adequacy of a 19.2 kbps dial up connection:

> We are saying that even the Telstra standard of 19.2 kbps is not enough. You really should be up around 48 kbps to do something.[22]

> You have 20 or 30 emails coming down the line and suddenly there is a large one with a one-megabyte attachment to it. You might as well give up. Then you have to use special techniques to try to delete that from the server so that you can get the rest of them. Otherwise, it just becomes ridiculous. That is at a speed of 9.6 kbps. It is not much better at 19 kbps, and it can be very frustrating even at 33 kbps, and then of course you start to get into the more normal speeds, the forties and early fifties, which you can get in certain parts of the metropolitan area.[23]

> I would say it would be virtually no value at all in the long term. I think they should be looking at better solutions because we are supposed to be getting an equal service across the nation. I connect in Ouyen regularly. I am in the centre of town, and at home I get probably an average of 44 kilobits per second[24]

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19 Consumers' Telecommunications Network, Submission 88, Attachment 2.

20 Regional Telecommunications Inquiry, *Connecting Regional Australia*, Recommendation 4.1, p 156.

21 Department of Communications, Information Technology and the Arts, FAQ – 19.2 kbps Licence Condition, http://www.dcita.gov.au/Article/0,,0_1-2_3-4_102257,00.html.

22 Ms Vicki Brooke, Committee Hansard, 20 May 2003, p 785; see also Roslyn Joseph, Submission 32.

23 Mr Graham Wilson, Committee Hansard, 20 May 2003, p 783.

24 Mr Robert Jardine, Secretary/Treasurer, Ouyen Incorporated, Committee Hansard, 23 April 2003, p 352.

2.25 The Committee asked Telstra about the reason that 19.2 kbps was chosen. In response it indicated that it was consulted about the decision but the matter was a public policy issue and it was not particularly involved in the establishment of the 19.2 figure.

2.26 The Committee also sought to establish what it would cost to upgrade the Telstra network to provide a higher minimum dial-up access speed for all Australians. In its report the Telecommunications Service Inquiry noted that in 1998 the ACA estimated that the cost of upgrading Telstra's customer access network to provide a minimum data speed of 33.6 kbps would be in the order of $4 billion. The ACA also found that an upgrade to 28.8 kbps would incur very similar costs.[25] The Telecommunications Service Inquiry reported in 2000 that Telstra estimated the cost of upgrading its network to provide a minimum data speed of 33.6 kbps would cost $4.486 billion.[26] In its submission to this inquiry Telstra said that:

> Telstra notes that, at that time, such statistics led to a number of parties calling for the wholesale upgrade of the PSTN. The enormous cost of such an upgrade made these proposals unviable. Instead, the Commonwealth Government and Telstra set up the Internet Assistance Program – a joint initiative to help improve the experience of dial-up users of the Internet by addressing performance factors affecting speeds reasonable for common Internet usage.[27]

2.27 During questioning from members of the Environment, Communications, Information Technology and the Arts Legislation Committee an official from the Department of Communications, Information Technology and the Arts referred to the earlier figures discussed in the Telecommunications Service Inquiry report as the most recent independent costing.[28] In later evidence to that Committee Telstra stated that on the basis of some rough calculations it would cost at least $5 billion to substantially increase the minimum dial-up speed.[29]

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25    Telecommunications Service Inquiry, *Connecting Australia*, 2000, p 171 referring to the report of the Australian Communications Authority Digit Data Inquiry, 1998.

26    Telecommunications Service Inquiry, *Connecting Australia*, 2000, p 171.

27    Telstra, Submission 107, p 49.

28    Mr Chris Cheah, Chief General Manager – Telecommunications, Department of Communications, Information Technology and the Arts, Official Committee Hansard, Senate Environment, Communication, Information technology and the Arts Legislation Committee, Inquiry into the Telstra (Transition to Full Private Ownership) Bill 2003, 7 October 2003, p 30.

29    Mr John Stanhope, Chief Finance Officer and Group Managing Director, Finance and Administration, Telstra Corporation Ltd, Official Committee Hansard, Senate Environment, Communications, Information Technology and the Arts Legislation Committee, Inquiry into the Telstra (Transition to Full Private Ownership) Bill 2003, 2 October 2003, p 78.

*Line dropouts*

2.28 Another issue which was raised in relation to dial-up services is the prevalence and effect of line drop outs. Several submissions to the Committee commented on connection failures and the costs and frustration associated with frequent line dropouts:[30]

> Of late I have been finding that the cost of our Internet access has been increasing, primarily due to call drop-outs, as we are on a fixed monthly plan with BigPond.[31]

2.29 One submission from regional Queensland outlined the efforts of the authors, who are pensioners, to solve the line drop-out problem they were experiencing with their dial-up access. In their efforts to overcome line drop out problems they have, so far to no avail:

- changed ISP four times;

- changed modems twice;

- reformatted their computer;

- had many visits from local computer technicians;

- been visited many times by Telstra technicians;

- sought assistance from the Internet Assistance Program; and

- sought assistance from the Telecommunications Industry Ombudsman.[32]

2.30 The cause of line drop-outs is unclear but some of the rural users who made submissions to the Committee blamed low dial-up speeds:

> …. The quantity and quality of signal delivery over the current network often leads to loss of connection with the ISP due to errors or time-outs.[33]

> I probably averaged 10 or 20 calls a week from people asking, 'Why are we dropping out so much?' We had people ringing up and saying, 'We've been trying to get onto the Internet and it keeps dropping out. We've had 10 or 20 dial-ups to get something downloaded and we just can't get it on a regular basis.' Internet banking services were severely affected by these drop-outs when they came in. People were trying to dial up all the time and

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30    Guyra Shire Council, Submission 15; Parry Shire Council, Submission 23,

31    Mr Geoff Thompson, Thompson Consulting Engineers Pty Ltd, Submission 1, p 2.

32    R & P Patterson, Submission 13.

33    Ms Roslyn Joseph, Submission 32.

> dropping out, and then they got so frustrated with it they just gave it away. That dropping out and the frustration of not being able to get adequate service is where a lot of the problems come from.[34]

2.31 The IAP, and the 19.2 kbps licence condition imposed on Telstra, are directed at establishing a minimum connection speed. The IAP self-help site provides some information which may assist consumers with line drop out problems, however, currently there is no specific program aimed at addressing the issue of line drop outs.

*Summary*

2.32 The issue of dial-up speeds was clearly of concern to many witnesses. These concerns were linked in some cases to the desire to set higher minimum standards for dial-up access and to ensure that these issues were addressed before the full sale of Telstra:

> Progressively upgrade dial-in connections to a minimum standard of at least 48kbps, paying attention to those metropolitan, regional, remote and rural areas where the present standard falls short of basic service delivery;[35]

> PLEASE have our phone and Internet services up to scratch before you consider selling OUR phone company.[36]

2.33 Dial-up access to the Internet can provide an adequate service for many users and can be expected to remain the preferred method of connection for many users. However, the speed and reliability of these connections remain a problem for many users. While the efforts made to date to address the issue of speed have been of some assistance to some users, the evidence received by the Committee clearly shows that a dial-up speed of 19.2 kbps is not considered adequate by users, and that line drop out problems can be as important an issue as speed.

## Higher speed data services

2.34 For many Australians dial up access to the Internet is unsatisfactory. The main reason for needing more speed is that many of the newer applications for the Internet, such as interactive gaming and downloading music, high resolution images and video files, are very data intensive:

> My clients now view broadband Internet speed as normal and regard my 56 Kbps dial-up connection speed as inadequate considering that I need to download large image files at times.[37]

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34    Mr Robert Jardine, Secretary/Treasurer, Ouyen Incorporated, 23 April 2003, p 350.

35    Mr Grahame Wilson, Submission 118, p 11.

36    R &P Patterson, Submission 13.

37    Helen Rix Graphic Design, Submission 127.

2.35 Other drawbacks with dial up access are that it ties up a telephone line while the consumer is online and response times can be relatively slow. The Department of the Senate IT section has estimated that a member of the public seeking to download a 1 MB submission through a standard dial-up connection would take about four minutes to do so. If the submission contained a 30 MB graphic, such as a photo, it would take 1½ to 2 hours to open!

2.36 Not every user of data services currently needs the higher speeds available through broadband, but the trend towards the need for faster services appears to be inexorable. There is a strong expectation in the community that access to higher speed services should be readily available and affordable and a view that economic development may be impeded by the lack of such access:

> Even some people in rural Victoria have access to broadband Internet access. Yet here I am in suburbia with absolutely no hope of upgrading from a prehistoric 56k up connection. Please help.[38]

> The inability to access bandwidth in key regional centres such as Townsville is of particular concern in Queensland, the only state in which a majority of residents reside outside the capital city. This situation is not only an impost to business growth but…also [of] considerable concern to successful development of this region.[39]

### *Definition of broadband*

2.37 There is some debate about when a higher speed data service can be described as broadband, but it is usually defined in terms of its characteristics of high data speed, always on access and as a service which does not tie up the consumer's telephone line when it is being used. In infrastructure terms broadband is usually transmitted over a dedicated digital link over a copper line, coaxial cable, optical fibre, satellite or radio link, or a combination of these. Broadband can transmit large amounts of data, voice or video over long distances.

2.38 In the United States the Federal Communications Commission defines broadband as a data service operating at 200 kbps or more in at least one direction. The ACCC also uses this benchmark in its surveys of broadband access. The Department of Communications, Information Technology and the Arts states that broadband is more commonly associated with the speeds equal to or greater than those provided by Asymmetric Digital Subscriber Line (ADSL), although the Department notes that many commentators consider 'true broadband' to involve speeds of one megabit per second (mbps) or greater. Microsoft has its own definition of at least 300 kbps. In Australia 'broadband' is generally used to describe services which provide data speeds equal to, or faster than 256 kbps (the entry point download speed for ADSL).

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38    Mr David Fraser, Submission 22.

39    Townsville City Council, Submission 126, pp 14-15.

2.39 Higher speed services can be either symmetric (ISDN, VDSL) or asymmetric (ADSL). Symmetric services provide the same speed for uploading to the Internet as they do for downloading data from the Internet. This is the most suitable type of service for many businesses which have to upload significant amounts of data to the Internet. Home users of broadband usually download far more data from the Internet that they upload, and therefore may be better served by an asymmetric service which allows them to download at a much higher speed than they upload.

### *Digital subscriber line*

2.40 Digital Subscriber Line (DSL) is a general term for a range of technologies which carry data-streams using digital signals over the copper lines. The most common of these technologies is Asymmetric Digital Subscriber Line (ADSL) which is used by telecommunication companies to provide high speed access to the Internet for home users and small businesses through their existing copper telephone lines. At the end of September 2003 there were 372,000 DSL subscriptions in Australia, an increase of 78% since the end of March 2003. DSL technologies account for 54% of all non dial-up subscriptions.[40]

2.41 Unfortunately ADSL is not universally available to all telephone users. There are a number of limitations which impede access to this service.

### *ADSL availability*

2.42 Much of the existing copper network in Australia was primarily designed and built to carry voice services for the simple reason that data services were unheard of at the time of its initial development. Parts of the copper network are over 50 years old. The significance of the emergence of new technologies such as ADSL has been that they have allowed the capability of the otherwise dated copper network to be augmented to provide higher speed access to the Internet. However, as Telstra informed the Committee during its inquiry into competition in broadband services:

> I think it is right to suggest that ADSL is an interim technology. It is probably the last sweating…of the old copper network assets.[41]

2.43 Without such technological developments, higher speed access to the Internet would only be achievable by the construction of a parallel network, almost certainly based substantially on fibre optic cable on main routes, with a range of other technologies used to make the final link to the customer's premises. Several network providers in Australia have chosen that route, although results have been mixed. As an example, Optus constructed its own HFC cable network (see discussion of HFC below) to be accessible to 1.4 million homes in the major population centres of

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40    Australian Bureau of Statistics, *Internet Activity - September 2003*, Series 8153.0, p 4.

41    Dr Tony Warren, Telstra, Proof Committee Hansard, 12 November 2003, p 74.

Brisbane, Sydney and Melbourne. It drew the Committee's attention to the high cost of this approach with an uncertain outcome:

> Our position is that we think it is pretty unlikely that there will be additional expansion of the HFC network…The economic experience with the network was that it was very expensive to build and it has not generated an economic return.[42]

2.44 Accordingly, in November 2003 Optus chose to expand its ability to market its broadband services elsewhere by signing an agreement with Telstra for access to its wholesale DSL network so that it could conveniently access the 'last mile' copper network between Telstra exchanges and customer premises:

> …we are focusing our strategy on ways that we can provide services to the 80% of households that the [HFC] network does not service in other ways…the Telstra resale DSL service is one of those options that we are now commencing with as a means of servicing other parts of the population.[43]

2.45 However, there are a number of limitations on ADSL availability because of the characteristics of the existing copper network and the extent to which Telstra has installed the equipment needed for the provision of ADSL.

2.46 In order to provide ADSL over a subscriber's line the telephone exchange to which that line is connected must be enabled through the installation of a Digital Subscriber Line Access Multiplexer (DSLAM). Telstra has enabled all of its major exchanges which cover metropolitan areas and major regional centres but many of its smaller exchanges, which are typically in rural and regional areas, have not been enabled:

> I have tried unsuccessfully now for 3 years to obtain broadband services to my area from Telstra only to be told that the exchange at Castlereagh, my exchange, is not ADSL capable, but will be upgraded sometime in the future. However, when I ask for some sort of evidence that this might be the case they simply give the same 'mantra' as they do not have a forward work plan at all for the up-grade of the exchange?[44]

> ADSL services have been provided in the western part of the Shire in the towns of Gisborne, Kyneton and will soon be in place in Woodend. The level of telecommunication services fall away in the central and eastern sectors of the Shire. The townships of Riddells Creek, Macedon, Mt

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42    Mr Paul Fletcher, Optus, Proof Committee Hansard, 13 November 2003, p 117.

43    ibid.

44    Councillor Paul Rasmussen, Hawkesbury Radio – 89.9 FM, Submission 6.

Macedon, Romsey and Lancefield do not have adequate broadband services, such as ADSL.[45]

2.47 Concerns about access to ADSL are not confined to rural areas or to the impact of old infrastructure. The Committee heard evidence from a member of the Townsville City Council, Australia's 11th largest city, about the difficulties of accessing ADSL:

ADSL broadband is currently inadequate across the city. Over 10 per cent of Townsville customers simply cannot get ADSL, due principally to network and technology constraints. The infrastructure installed by Telstra over the recent years has led to this situation.

We have over 50 RIMs throughout Townsville, which are not compatible with ADSL, mostly in the newer subdivisions. Townville, being a rapidly growing provincial city, has a lot of people living in housing estates which have been developed in the last five, six, seven or eight years, and they do not have access to ADSL because of the installation of RIM technology.[46]

2.48 Telstra advised the Committee that it had already enabled or has plans to enable about 1,000 of its 5,058 exchanges. Telstra claims that those exchanges provide services to approximately 84 to 85 per cent of its customers.[47]

*ADSL demand register*

2.49 The Committee also examined how Telstra will determine what exchanges will be enabled in the future. Telstra has indicated that it now has a commercial focus on its ADSL roll-out based on demand and the cost structures within various areas[48]. Initially Telstra used information gathered from its web site to determine the level of demand:

What we had prior to October was data that we were able to extract from what we call the mini SQ failure attempts. On the BigPond web site, customers lodge their phone number to see if they can get access to ADSL. Where those phone numbers were entered and they did not result in an exchange being enabled or there was a pair gain system or something preventing it, we were able to take that information and process it in some

45 Macedon Range Shire Council, Submission 33.

46 Councillor Ray Cloonan, Townsville City Council, Official Committee Hansard, 28 April 2003, p 431.

47 Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p 884.

48 Ibid., p 899.

way as to give us a proxy, if you like, for what we will get out of the demand register.[49]

2.50 In recognition that demand for broadband is growing rapidly, Telstra has now launched an ADSL demand register which will allow customers to register their interest in ADSL services.[50] Telstra will consider the demand for services at individual exchanges in deciding which exchange will be enabled in future. However, the Committee's inquiry found there was some confusion about what level of demand had to be demonstrated before an exchange would be enabled, and about the use of the earlier data gathered by Telstra.

2.51 One witness told the Committee that Telstra had advised it that the number varied from 20 customers to 50 customers.[51] Another witness believed that 150 potential customers were required.[52] This issue was raised with Telstra during estimates hearings. In evidence to the Committee Telstra has indicated that the level of interest recorded on the demand register which will trigger the enabling of an exchange depends on the economics of particular sites. At the time the issue was discussed Telstra had set thresholds on approximately 160 exchanges. If Telstra receives 60 registrations it will undertake the modelling work required to set a threshold for a particular exchange.[53]

> At the moment we have three different thresholds on the current register: 150, which is by far the majority of the ones that have been set to date; I think there are three at 225; and one exchange at 300, from memory.[54]

2.52 The Committee was told by one witness that Telstra had encouraged people to register their interest in broadband through its original mechanism but had later been told that since the introduction of the demand register 'that information can no longer be sourced'. The Committee raised this issue with Telstra who responded saying that:

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49   Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Senate Environment, Communications, Information Technology and the Arts Legislation Committee, Budget Estimates Supplementary Hearings, Official Committee Hansard, 3 November 2003, p 73.

50   Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p. 885.

51   Mr Daren Kennaugh, IT Manager, Gilgandra Shire Council, Environment Communications, Information Technology and the Arts References Committee, inquiry into competition in broadband services, 1 October 2003, p 36.

52   Mr Christopher Lane, Chief Technical Officer, Coastalwatch Holdings Pty Ltd, Environment Communications, Information Technology and the Arts References Committee, inquiry into competition in broadband services, 2 February 2004, p 31.

53   Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Senate Environment, Communications, Information Technology and the Arts Legislation Committee, Budget Estimates Supplementary Hearings, Official Committee Hansard, 3 November 2003, p 73.

54   Ibid., p 73.

> Telstra's BigPond had a pre-existing system for gathering expressions of interest from customers wanting ADSL. This system is being maintained, however those expressions of interest are now being fed through to the Demand Register. Telstra Wholesale is also collecting information for the register from other participating ISP's customers via those ISP's.
>
> In relation to past expressions of interest, Telstra Wholesale has written to its ISP customers suggesting that they may like to include on the register recent expressions of interest that they have collected from their customers.
>
> BigPond plans to lodge on the register expressions of interest received in the last three months. Given that customer circumstances may have changed with the passing of time, those who lodged longer than three months ago will be contacted by email to see if they are still interested in a service, and in registering their interest.[55]

2.53 Telstra has also said that it sees the demand register as an internal tool for its own management purposes. During hearings Telstra was asked if it would make information on the register available to its competitors and, if not, how those competitors would know if there is sufficient demand to justify the installation of their own equipment in Telstra's exchanges. In response Telstra indicated that it would expect its competitors to do their own market research to determine the level of demand.[56]

2.54 In January 2004 Telstra announced that Loxton, in South Australia, will have its exchange upgraded to provide ADSL after more than 200 local businesses and residents registered for broadband using the Telstra ADSL Demand Register.[57]

2.55 In earlier evidence Telstra had indicated that the broadband demand register would be a two phase development which would, in the second phase, examine demand at the RIM level.[58] Telstra was also able to advise the Committee that new equipment may become available which will alter the cost structure for providing ADSL and may allow it to be made more widely available.

> I mentioned yesterday that we are at the very late stages of finalising a tender evaluation on DSLAM equipment. I have been advised that there is the high likelihood of some smaller capacity DSLAMs coming through that

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55    Telstra, Submission 144a, Senate Environment, Communications, Information Technology and the Arts Legislation Committee, Inquiry into the provisions of the Telstra (Transition to Full Private Ownership) Bill 2003.

56    Mr Bill Scales, Group Managing Director, Regulatory Corporate and Human Relations, Telstra, Proof Committee Hansard, 7 August 2003, p 893.

57    Telstra Corporation Limited, Media Release, 21 January 2004.

58    Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, , Senate Environment, Communications, Information Technology and the Arts Legislation Committee, Consideration of Budget Estimates, Official Committee Hansard, 26 May 2003, p 185.

process.  So, yes, it has the potential to lower one cost component of the total ADSL provisioning equation.  But I go back to the other point: you still have to have all the other aspects in place.  Typically, the smaller the installation the higher the fixed costs of transmission links, power and other things become.  There still needs to be a case by case economic evaluation. It ought to be slightly more favourable because the incremental cost of the DSLAM is lower but the cost per port will be a little higher.[59]

2.56 While Telstra's general approach to the future roll-out of ADSL may be reasonable in commercial terms, the Committee remains concerned about its impact in rural, regional and remote areas.  This approach may result in many consumers in those areas facing delays before they can access ADSL, or possibly never gaining access to that technology.  As one witness told the Committee it can be quite hard to get 150 people on a demand register in regional areas.[60]  In the Committee's view access to affordable broadband should be available to every Australian.

*ADSL technological limitations*

2.57 Even if an exchange is enabled for ADSL, not all customers connected to the exchange will necessarily be able to obtain access.  Signals carried on copper wires deteriorate depending upon the length of the line, the gauge and condition of the line, and the number and condition of any joints on that line.  In the past the effect of this has been to limit the distance from the exchange at which ADSL can be offered to approximately 3.5 km:

> I could not believe the fact I live in a heavily populated suburb of Melbourne only 4kms from the telephone exchange and cannot get a broadband service.[61]

> Many telephone exchanges in rural areas do not have the capability to provide broadband at all.  Those that do can only provide broadband services to subscribers at a limited distance from the exchange (3km is the maximum, I believe).  This make it impossible for rural subscribers to receive this service.[62]

2.58 In January 2004 Telstra announced that new testing and investigation by Telstra Research Laboratories had shown that ADSL could be offered at greater distances from an exchange.  Telstra said that the revised limit should extend ADSL coverage to

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59    Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p 903.

60    Mr Christopher Lane, Chief Technical Officer, Coastalwatch Holdings Pty Ltd, Environment Communications, Information Technology and the Arts References Committee, inquiry into competition in broadband services, 2 February 2004, p 31.

61    Mr David Fraser, Submission 22.

62    Ms Roslyn Joseph, Submission 32.

at least 4 km in line distance from an ADSL enabled exchange, or further, depending on the cable type and the wire gauge. Telstra claimed that this would make ADSL available to an additional 400,000 telephone services and improve the current reach of ADSL from approximately 75 per cent of services to up to 90 per cent over the next three years.[63]

*ADSL affordability*

2.59 Witnesses also raised the issue of access to broadband services from an affordability perspective. Their main concerns relate to connection costs and the existence of download limits which make ADSL dearer in Australia than in comparable countries.[64] In response Telstra indicated that caps were used in Australia partly because of the immature stage of the market:

> So the reason we have caps in place is that we did not have an efficient means by which that allocation could be determined by individuals, partly because we are in a relatively immature period of the growth of this high-speed Internet, or broadband.[65]

2.60 Telstra also outlined some of the reasons that it claims lead it facing higher costs in providing broadband than telecommunications companies in other countries and went on to indicate that broadband costs could be expected to decline as volume increases:

> The main thing that I was going to point out today was the extensive nature of the long-distance multi-megabit bandwidth links that we have to a very large number of ADSL enabled exchanges. In a lot of the other countries, particularly those that are a lot smaller, those multi-megabit links are provided with raw fibre connections over relatively short distances. They do not have the expensive transmission links and the extensive optical fibre or radio routes and so on. There is a huge difference in the cost of that backbone network.[66]

2.61 The number of broadband services being provided by ADSL grow by 99.1% between June 2002 and June 2003.[67] Telstra advised the Committee that:

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63    Telstra Corporation Limited, Media Release, 19 January 2004.

64    Mr Robert Ardill and Mr Grant Roper, Submission 8; Mr Andrew Freeman, Submission 21;

65    Mr Bill Scales, Group Managing Director, Regulatory Corporate and Human Relations, Proof Committee Hansard, 7 August 2003, p 918.

66    Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p 919.

67    Australian Competition and Consumer Commission, *Snap Shot of Broadband Deployment as at 30 June 2003*.

Only Telstra is investing more than $1 billion in rolling out the ADSL network and absorbing the risk that comes with such a massive investment.[68]

2.62 It is the consequence of such investments that the Committee is examining in its concurrent inquiry into competition in broadband services.

*ADSL reliability*

2.63 During the course of the inquiry the Committee noted media reports of problems with the quality and reliability of Telstra's ADSL service. These media reports were reflected in some of the submissions received by the Committee:

Early adopters of DSL reported high levels of dissatisfaction with quality and reliability of service. Talk of class actions against Telstra for regular failings of its ADSL service reflects this - Telstra does not offer business customers guarantees on its service availability or quality (Shipton 2001). Broadband suppliers need to offer quality of service standards such as minimum level service agreements. [69]

2.64 In its submission to the Committee Telstra commented on these problems and the steps it had taken to increase customer confidence in the service:

Early technical problems with the service an inevitable feature of all new technology platforms have been largely overcome. Telstra has also introduced ADSL Service Level Guarantees (SLG) to increase customer confidence in access reliability and reflect Telstra's confidence in the ADSL network. The SLGs that now apply to the availability performance of this network are as listed in the following chart.

| 97% < 99% | 10% Monthly subscription fee Rebate |
| 94% - <97% | 20% Monthly subscription fee Rebate |
| <94% | 50% Monthly subscription fee Rebate |

These SLGs, which are believed to be a world first, have been set up so that customers are automatically rebated in the event of a service disruption. This means the customer will be rebated regardless of whether they were aware of the outage.[70]

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68    Telstra submission to the Committee's inquiry into competition in broadband services, submission 21, p 31.

69    Council on the Ageing (Australia), Submission 39, p 7.

70    Telstra Corporation Limited, Submission 107, p 59.

2.65 In evidence to the Committee the ACA confirmed that it does not monitor broadband or ADSL faults, although it is considering doing so.[71] In its submission Agile suggested that the National Reliability Framework should be extended to ADSL broadband services.[72] Given the growing importance of data services to both consumers and the economy the Committee believes that monitoring of service standards must extend to data services.

### *HFC cable*

2.66 The generic term 'cable' is generally used to refer to a network of hybrid fibre coaxial cable through which pay TV services are provided to households. The networks consist of optical fibre on main routes, supplemented by coaxial cable closer to the customer's premises. These networks can also be used to provide Internet access with download speeds of 256-2000 kbps and upload speeds of 128 kbps. Unlike the way ADSL operates with an individual connection for each customer, cable users share access to the same HFC loop, meaning cable speeds can be affected when a large number of users are accessing the network at the same time. There are 215,400 cable broadband services connected in Australia.[73]

2.67 The biggest drawback with cable broadband is the limited extent of access to the existing cable networks:[74]

> When I contacted Telstra, they simply said "there is no cable in your area, so you can't be connected to either Foxtel cable TV or the Internet cable network".

> We had to pay $2,700 to have a satellite dish installed to receive Foxtel "cable" TV.[75]

2.68 Even where the physical infrastructure exists, access is not always available:

> Optus has a cable obtrusively erected on the power poles in front of our units. It is 1.5metres from the wall of the units and a conduit is in place where the cable can be installed. There is a communications room set aside for any equipment Optus may need to install and all units are already wired

71    Dr Robert Horton and Mr John Neil, Australian Communications Authority, Committee Hansard, Senate Environment, Communications, Information Technology and the Arts Legislation Committee inquiry into the Provisions of the Telstra (Transition to Full Private Ownership) Bill 2003, 7 October 2003, p 46-47.

72    Agile Pty Ltd, Submission 136.

73    Australian Competition and Consumer Commission, *Snap Shot of Broadband Deployment as at 30 June 2003*.

74    The coverage of the existing cable networks is outlined in Chapter 1.

75    Mr Richard Millburn, Submission 2.

> back to the communications room.  Optus will not even talk to us other than to say, "we don't connect to home units".[76]

2.69 The number of broadband services being provided by HFC cable grew by 52.9% between June 2002 and June 2003.[77]

*ISDN*

2.70 Integrated Services Digital Network (ISDN) is a reliable, well established technology for transmitting data.  It is a digital alternative to an analogue public switched telephone service, which uses copper telephone lines to carry a 64 kbps data service.  Telstra is currently marketing an 'ISDN Home' product which uses two ISDN lines to provide a 128 kbps service.  This speed is lower than that which is generally accepted as falling into the definition of 'broadband' and the ACCC does not collect figures on ISDN in its Snap Shot of Broadband Deployment.  But ISDN does have the advantage that it is significantly faster than dial-up access to the Internet.  Higher speeds can be achieved by combining more ISDN lines but these services are generally only affordable by business users.

2.71 ISDN enjoys advantages over other technologies for some users.  While cable and ADSL have significant limits on their availability, ISDN is available to 96 per cent of the Australian population.  Because it is an older technology it is available to customers served by some pair gain systems which will not support ADSL and, with the use of repeaters, is available up to 20 kilometres from an exchange.[78]  ISDN provides a symmetrical service which is more suitable than ADSL for customers who upload significant amounts of data to the Internet.  Nevertheless some submitters to the Committee expressed concern that ISDN does not free up a phone line[79] and that it is relatively expensive.[80]

2.72 In its most recent publication on Internet activity the Australian Bureau of Statistics reported that the number of ISDN subscriptions had fallen from 16,000 at the end of March 2003 to 14,000 at the end of September 2003.[81]

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76    Mr Richard Millburn, Submission 2.

77    Australian Competition and Consumer Commission, *Snap Shot of Broadband Deployment as at 30 June 2003.*

78    Mr Don Pinel, Regional Managing Director, Telstra Country Wide Queensland and Denis Mullane, Manager, BigPond Network Capability, Telstra, Committee Hansard, 7 August 2003, pp 919-915.

79    Mr David Fraser, Submission 22.

80    Mid Murray Council, Submission 30.

81    Australian Bureau of Statistics, *Internet Activity - September 2003*, Series 8153.0, p 11.

*Satellite*

2.73 The most widely available method of gaining access to broadband technology is by satellite. Satellite broadband is available throughout Australia. It represents the most suitable technology in areas where population densities are very low. Satellites are radio relay stations in orbit above the Earth that receive, amplify and redirect radiocommunications signals.

2.74 There are three ways of accessing broadband by satellite.

- One-way satellite is the cheapest form of satellite access. It uses a satellite to download data at broadband speeds of up to 400 kbps but it depends on a dial-up connection over a fixed line to upload data to the Internet.

- A one-way satellite with an ISDN uplink provides a higher upload speed but is more expensive than one way satellite.

- Two-way satellite uses a satellite connection in both directions, but is relatively expensive. [82]

2.75 All of the satellites operated in Australian satellite slots are owned and managed by Optus, although transponders on those satellites are leased by other telecommunications companies. Some satellites operated from overseas can be used to provide services into Australia.

2.76 The principal drawback associated with satellite services is the cost. Satellite access involves higher upfront costs than other technologies and the ongoing cost of satellite access is usually higher than for other forms of broadband. Many submitters put the view to the Committee that satellite was not affordable:[83]

> Of course for a lot of money I could get a two-way satellite link – "faster" of course, but hardly falling into the category of "affordable".[84]

> A satellite system may soon become available from Optus, but has horrendous costs for very limited increase in speed - and NO promises from them either!!!.[85]

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82    For a discussion of satellite download and upload speeds see Proof Committee Hansard, 7 August 2003, p 927-929.

83    Break O'Day Council, Submission 11; King Island Council, Submission 19; Midac Technologies Australia Pty Limited, Submission 20; Roslyn Joseph, Submission 32.

84    Mr Geoff Thompson, Thompson Consulting Engineers Pty Ltd, Submission 1, p 2.

85    Councillor Paul Rasmussen, Hawkesbury Radio – 89.9 FM, Submission 6.

> I rang Foxtel and asked to be connected to the satellite Internet network, but alas again, it requires another dish as it is a different satellite which controls the Internet network. We can't afford another dish.[86]
>
> To have the same Internet speed as the rest of the civilised world also costs a premium. We cannot get normal broadband cable so it requires us to install a satellite to use in conjunction with a up connection. This service (according to Telstra's web site) costs $218.90 for installation, $70.95 a month plus up costs. The 2 way satellite service costs $399 installation, $699 hardware and at least $120 a month for the subscription. On the other hand, people just around the corner only have to pay for a cable broadband service which costs $259 for installation and then $54.95 a month with no dial up costs. This is an outrageous difference.[87]

2.77 Another issue for potential satellite users is latency. Unlike terrestrial services, data transmitted to a satellite has to be beamed up to the satellite and back to an earth station before being fed into the terrestrial telecommunications network. This causes a small but sometimes noticeable delay in the transmission:

> While initially satellite looked to be a great solution to Australia's vastly spread population, it was soon realised the technology's greatest enemy was price and the fact it was not suited to many applications sensitive to latency (delay). Such applications involving time sensitive data and multiplayer games could not be used across the satellite service. For these reasons satellite is not a popular choice.[88]

### *Mobile phone and wireless*

2.78 Wireless networks can provide high speed data transmission by using radio waves instead of fixed lines. There is a wide range of wireless technologies which can provide data services, the most common of which are the mobile phone technologies.

2.79 Existing second generation GMS and CDMA mobile phone systems provide low speed data rates of around 9.6 to 14.4 kbps. Higher speeds will be possible as these networks are upgraded. Existing narrowband 2G digital mobile phone networks can support data rates of up to 384 kbps although in practice speeds of 32-64 kbps are expected. 3G technologies offer the prospect of data transmission rates of up to 2 mbps for low mobility indoor applications. The most recent Australian Bureau of Statistics report on Internet activity identified only 3,000 mobile wireless Internet subscriptions.[89]

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86    Mr Richard Millburn, Submission 2.

87    Mr Brian Ready, Submission 94.

88    Mr Robert Ardill and Mr Grant Roper, Submission 8, p 8.

89    Australian Bureau of Statistics, *Internet Activity - September 2003*, Series 8153.0, p 11.

2.80 Wireless local area networks (WLAN) use low powered transmissions on class licensed spectrum[90] to transmit data over distances of 50 to 150 metres. They usually operate on the IEEE 802.11b or related standards which are capable of providing data rates of 1-2 mbps. WLANs can be used by consumers to establish their own local networks to connect devices in their own home or to other computer users nearby. They are also used by commercial operators to establish hotspots in public areas such as airports, hotels, cafes and convention centres. To connect to the Internet the wireless base station must have a connection using some other technology such as ADSL.

2.81 Wireless local loop (WLL) networks use radio access technology to link a customer to a local exchange or service provider. They can be used to provide broadband access to customers over a range of up to 40km and are particularly suited for use in large facilities or in regional areas.

2.82 To date wireless technologies have not played a significant role in providing access to data services in Australia. The second generation mobile phone networks provide only low data rates. Australia's only 3G network was not launched until April 2003 and has only 50,000 subscribers.[91] Several companies have installed WLAN hotspots but this is a recent development and the technology is not in widespread use. Similarly, although some WLL networks have been installed there has been no widespread take-up of this technology.

2.83 The deliberations of the House of Representatives Standing Committee on Communications, Information Technology and the Arts inquiry into wireless broadband are outlined in Appendix 5. It is appropriate to reiterate its key conclusion 'that no wireless broadband technology is able to handle the data rates of the best wire-line technologies…the solution to the "last mile" service involves a mixture of technologies, both wire-line and wireless.'[92]

*Other network architectures*

2.84 The TransAct network, discussed in Chapter 1, uses DSL technology to provide the final connection to the customer. For residential customers the technology currently supports the delivery of a total of 36 mbps downstream and 1 mbps upstream. Home users are offered a range of broadband speeds up to 2 mbps/256 kbps. For business customers, symmetrical capacity can be provided at speeds of up to 13 mbps.

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90    Class licensed spectrum can be used by anyone, without the need to obtain a licence, provided that they operate in compliance with the class licence.

91    Hutchinson Telecoms, Media Release 5 August 2003, updated by AAP article of 2 January 2004, published in Herald Sun on 3 January 2004 as '*Another tough year for Telstra.*

92    House of Representatives Standing Committee on Communications, Information Technology and the Arts, *Connecting Australia! Wireless Broadband,* November 2002, p. xi.

2.85 Bright Communications, in Western Australia, has trialled both fibre to the home and fibre to the kerb technologies and provides a variety of packages for home users offering speeds of up to 1mbps/256 kbps, and for business users a symmetrical service of up to 2 mbps. Telstra has also flagged its intention to work with property developers on a major trial of fibre-to-the-home technology in the near future.[93]

2.86 A variety of other technologies for delivering broadband are being developed or trialled. The most commonly discussed technologies use existing electricity supply networks to deliver digital data services. These technologies are described as powerline communications (PLC), powerline telecommunications (PLT) systems or broadband powerline (BPL) systems. The new broadband systems provide data rates of 4-20 mbps:[94]

> PLC systems consist of terminal devices that are plugged into or attached to the electrical power supply network and allow data to be transmitted via the network to other terminal devices plugged into or attached to the network. The use of existing electrical power supply network wiring reduces costs and provides convenient access to broadband interconnection between devices.[95]

2.87 In a recent background paper the ACA noted that several European countries have adopted their own requirements for powerline communications systems and that there are a growing number of systems already being deployed in Europe and surrounding countries to provide last-mile broadband services.[96] The paper identified a range of issues arising out of the possible use of these technologies in Australia and the differences between the power supply network in Australia and those used overseas. These issues relate to:

- compatibility between private and public networks;

- telecommunications policy issues; and

- radiocommunications interference issues.[97]

2.88 In its summary the ACA said that:

> Significantly, differences between the Australian powerline environment and overseas countries developing standards for broadband powerline

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93   *The Australian*, breaking news Internet page, 30 March 2004.

94   Australian Communications Authority, *Broadband Powerline Communications Systems – A Background Brief*, September 2003, p 2.

95   ibid.

96   ibid., p 12.

97   ibid., p 7.

communications systems might lead to "safe" limits in those countries being "unsafe" in the Australian context. This area would seem to need further investigation. In due course, developments in the UK might provide a valuable guide, because of the apparent similarities in the AC power supply networks of the two countries. However, there is a risk that overseas findings (and therefore standards' limits) might not be directly transferable into this country.[98]

2.89 The ACA stated that terminal devices for in-house applications have recently begun to be marketed in Australian and that an electrical supply authority has approached the ACA recently about the conduct of trials of equipment for last-mile applications.[99] However, it seems unlikely that this technology will become generally available to Australian consumers in the near future.

## Cost of broadband

2.90 The price of broadband in Australia has frequently been criticised on the grounds that it is far more expensive than in comparable countries. The then National Office for the Information Economy, quoting Australian Bureau of Statistics figures, identified the high cost of access to the Internet as the main reason for households not having Internet access.[100] One reason given for the high cost of broadband in Australia was the very high cost of high capacity links:

> A major cause for the high cost of broadband services is the cost of high capacity links. By comparison with other countries Australia has high tariffs for network capacity as shown by the graph in Appendix A. A number of small carriers have indicated that the first major drop in broadband prices (from more than $150.00 to approximately $100.00 per month) was due to Telstra dropping the cost of backhaul circuits.[101]

2.91 In early 2004 Telstra significantly cut its charges for ADSL. At the time of finalising this report the full effect of this change in prices was not clear. Telstra's competitors and the ACCC have raised concerns that wholesale prices have not fallen by a similar amount and that Telstra may be engaging in anti-competitive behaviour. These issues are the subject of ongoing discussions and their long term impact on pricing and competition in the broadband market is unclear.

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98    Australian Communications Authority, *Broadband Powerline Communications Systems – A Background Brief*, September 2003, p 16.

99    ibid., p 14.

100   National Office of the Internet Economy, *The Current State of Play – Online Participation and Activities*, 2003, p 10.

101   Communications Expert Group Pty Ltd, Inquiry into Competition in Broadband Services, Submission 30.

*Summary*

2.92 Higher speed data services are available through a variety of technologies throughout Australia, but there is considerable variation in the broadband options and prices in different areas. In parts of some capital cities consumers have the choice of ADSL, cable, ISDN or satellite. In other parts of the same cities they are limited to more expensive ISDN or satellite because cable is not available and their fixed line connection will not support ADSL. In some rural and remote areas consumers are limited to satellite. Decisions about the roll-out of broadband in Australia have largely been made on the basis of commercial considerations and the resulting lack of uniform access to affordable broadband is a source of frustration to many consumers:

> Senator Alston's comments that it is a commercial decision not to supply service to me and my family is not on in the year 2002.
>
> Please go into bat for the little people like me who are discriminated against because we live in a home unit. Telstra should be giving service just as Optus should, not making commercial decisions not to serve the public who owns at least 50% of Telstra.
>
> What type of commercial decisions will Telstra make if they become private?[102]

2.93 A common theme in the evidence to the Committee was that consumers in rural, regional and remote areas need to have the same level of access to the Internet as those in the capital cities:

> We need to be able to have very similar, if not the same, level of Internet access available in the country as in the capital cities. This also needs to be at a similar cost if we are to be competitive with our city cousins.[103]
>
> I firmly believe that, with regional situation such as Dungog, uncapped broadband (speed) capabilities could provide enormous economic stimulation to the area.[104]
>
> More than anybody persons living in rural and remote areas need access to modern telecommunications services. Access to modern Broadband services could not only provide security and peace of mind to persons, but it could also be a major lifestyle improvement. However at this time the provision of these services at a comparable cost to persons living in the cities appears unlikely.[105]

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102   Mr Richard Millburn, Submission 2.

103   Mr Geoff Thompson, Thompson Consulting Engineers Pty Ltd, Submission 1, p 2.

104   Midac Technologies (Australia) Pty Limited, Submission 20.

105   Hay Shire Council, Submission 17. See also Orana Development Board, Submission 42.

> We submit broadband should be regarded as a commodity similar to water and power therefore justifying some form of cross subsidisation to ensure competitive services are provided in the rural areas.[106]

2.94 The frustration of country residents is often shared by their city counterparts who might have no access to a terrestrial broadband service even though neighbouring suburbs have access to more than one technology. A Perth resident lamented the fact that residents in the suburb of City Beach have no access to broadband while those in the nearby suburb of Crawley have access to cable TV, cable broadband and ADSL.[107]

2.95 The frustration many consumers experience as a result of their inability to obtain access to affordable broadband appears to be aggravated by Telstra heavily advertising services which they are unable to access.[108]

2.96 The cost of broadband is also seen as an impediment to the more rapid take-up of broadband in Australia, as are the pricing structures. The lack of clarity in acceptable user plans[109] and the use of download caps are also seen as impediments to the take-up of broadband:

> The current pricing structure where service is capped at 3gig by the two seemingly main providers where additional megabytes are charged at exorbitant rates by Telstra or being throttled to 28.8kbps modem speed by Optus could hardly be called a step forward and don't inspire the average Australian to connect to the Internet via broadband as they would in other developed countries with affordable connections such as the UK or the US.[110]

2.97 The evidence received by the Committee clearly shows that access to affordable broadband services is viewed as an essential service and that this service is not being delivered to all of the people of Australia. The Government's National Broadband Strategy will help to address this issue by making broadband more available and affordable for some consumers. However the Committee does not believe that it represents a comprehensive solution to the problems identified by this inquiry because:

- the programs are only funded for four years; and

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106 Yarriambiack Shire Council, Submission 12.

107 Mr Rodney Bradley, Submission 9.

108 Mr Geoff Thompson, Thompson Consulting Engineers Pty Ltd, Submission 1, p 2; Break O'Day Council, Submission 11.

109 Mr Steve Judd, Submission 4.

110 Mr A Priede, Submission 3.

- the funding is limited and will probably only assist a small number of users.

2.98 The Government's various access programs are discussed in more detail in Chapter 4 of this report which also discusses the 'doughnut' of poorer service areas created by Government programs aimed exclusively at the most disadvantaged geographic areas.

2.99 In the Committee's view, the Government's piecemeal approach to data services is unlikely to meet the needs of the community and may act as an impediment to Australia's economic development. Access to fast, affordable, reliable data services should be accorded the same importance as access to voice services.

## Pair gain systems

2.100 Pair gain systems are a significant impediment to the delivery of the full range of modern telecommunication services to many consumers.

2.101 Pair gain systems enable multiple standard telephone services to be carried over a smaller number of transmission links. They are employed throughout the Telstra network wherever there are insufficient copper pairs to meet the current demand for services. Telstra currently uses 16 pair gain systems which range from small units which allow two telephone services to be operated over a single pair of copper wires to large systems which allow up to 480 standard telephone services to be provided by connecting them to an exchange over single optical fibre cable. The advantage of a pair gain system is that it offers a cost effective alternative to laying additional copper cable where the existing infrastructure is inadequate.

2.102 Most pair gain systems are not able to provide the full range and standard of services which can be delivered over a normal copper pair. Restrictions on the standards of service imposed by various pair gain systems include:

- inability to support features such as calling number display and faxstream;

- possible inability to obtain a line when it is wanted; and

- restrictions on data speeds and access to broadband.

### Access to voice services

2.103 One type of pair gain system - 16/96 - is used to provide up to 96 telephone systems by switching calls through only 16 copper pairs. The Tasmanian CEPU made the point that with this system, if eight of the 96 customers on such a system were to phone another eight customers connected to the system that would exhaust the available capacity leaving up to 80 customers without access to a telephone service.[111]

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111  Communications, Electrical and Plumbing Union, Tasmanian Communications Branches, Submission 133, p 5.

In its submission the CEPU Tasmanian Communications Branches identified 12 areas where pair gain systems were affected by congestion but where there was no known relief in either funding or other action to ameliorate the situation.

2.104 Similar congestion problems were reported in relation to the number of transmission lines available at Digital Radio Concentrator Systems (DRCS) exchanges.[112] It should be noted that DRCS is a solar powered communications system designed by Telstra for voice and very low speed data applications in remote areas but, as an ageing technology, is currently being replaced under Telstra's Remote Areas Telecommunications Enhancement program (RATE) with High Capacity Digital Radio Concentrator Systems (HCRC).

2.105 In some cases customers obtain a second telephone connection to provide a separate line for a fax or Internet connection, or to reduce reliance on a single line in case of emergency. Some customers in this situation are perturbed to subsequently discover that their second line has been connected through a pair gain system which leaves them with the same inadequate or vulnerable service which they were hoping to avoid by having a second line connected. In effect they are paying the full price for two lines but receiving two inadequate services using the same line:

> My new service took twice as long to install as they said and was connected to a RAM 8 system at that stage I had no idea what that was but I soon found out. As both my lines run off the same RAM 8 if there is ever a problem with this unit both my lines are out of action.

> It appears that because my service is so far from the exchange this RAM 8 needs a battery back up somewhere between the unit and the exchange they seem to record where they put the RAM 8s but the service personnel state that there are hundreds in my area and no record of the battery locations has ever been kept. Thus if there is a problem they could look at hundreds of batteries not knowing which one is attached to which RAM 8. My phone service has since this RAM 8 was installed continually cut in and out and unless I actually go to use the phone I do not know if it is working or not.[113]

2.106 The Boulding case[114] is one of the more notorious examples of the pitfalls of pair gains. The Boulding family had requested a second line to their home to ensure that they had a reliable service in case of an emergency, although Telstra's records show that Telstra understood that the second line was requested to provide an Internet connection. Telstra installed the second line by using a Telespect 2 Digital Pair Gain

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112     Three Rivers Landcare Group, Submission 56; Ewan Community North Queensland, Submission 57; Hidden Valley Community, Submission 58; Upper Burdekin Progress Association, Submission 59.

113     Mr Peter Kane, Submission 29.

114     Detailed in Appendix 5.

System which used a digital signal transmitted along the single copper pair serving the Boulding residence to provide both services to that home.

2.107 Although the actual cause of the fault on the day of Sam Boulding's fatal asthma attack has not been identified, an investigation into the telephone services provided to the Boulding family was critical of the use of a pair gain system on that line:

> The technical characteristics of the Kergunyah customer access network (CAN) infrastructure, in combination with the digital pair gain system providing services to the Boulding family, were not conducive to long-term reliable service in this instance. These technical characteristics around the time of January 2002 were not consistent with those recommended by Telstra for the type of electronic equipment installed on this infrastructure.[115]

### *Dial up speeds*

2.108 Pair gain systems also impact on dial-up access speeds on fixed line networks. In evidence to the Committee about the general impact of these systems, Telstra stated that:

> The main issue is that the broad delivery of service is really not impacted upon. Some aspects of services, as we all know, are impacted on to some extent - for example, different generations of pair gain equipment can have an impact on dial-up data speeds, but that also is a very complex area and depends on the length of lines, type of pair gain equipment and so on. By and large, you can still operate dial-up data through pair gain systems, but you get some slightly different performance outcomes, depending on the particular type of system.[116]

2.109 Telstra provided the Committee with the following table showing the capability of various pair gain systems.

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115 Australian Communications Authority, Investigation into the provision and maintenance of telephone services to the Boulding family in Kergunyah, north-eastern Victoria, March 2002, p. 6.

116 Mr Dennis Mullane, Manager, BigPond Network Capability, Committee Hansard, 7 August 2003, p 859.

**Telstra Rural and Remote Access Technologies**

(Last Updated 2002)

| Infrastructure Platform | Description | Dial-up Data Rate(1*) | Homeline Product Features (2*) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Call-Waiting | Call-Forward (9*) | Call-Barring | Call Return *10# | 3-way Chat | Call Back Busy | Calling Number Display (CND) | CND-Blocking | Faxstream Duet | Message-bank Home |
| **RADIO CONCENTRATORS, POINT-TO-POINT RADIO and FIXED WIRELESSACCESS** | | | | | | | | | | | | |
| Analogue Radio Concentrator System (ARCS) | 8 channel analogue radio concentrator (150 MHz) | up to 4.8 Kbps | N | Y | Y | Y | N | N | N | Y | N | Y |
| Digital Radio Concentrator System (DRCS) | 15 channel point-to-multipoint radio concentrator (500 and 1500 MHz) | up to 7.2 Kbps | N | Y | Y | Y | N | N | N | Y | N | Y |
| High Capacity Radio Concentrator IRT2000 V9.2 | TDMA point-to-multipoint radio concentrator system operating in the 500 MHz and 1500 MHz bands Up to 30 VF or data channels. | up to 26.4 Kbps | Y | Y | Y | Y | Y | Y | N | Y | Y | Y |
| High Capacity Radio Concentrator IRT2000 V10.3 (equipped with ERS-C customer end) | TDMA point-to-multipoint radio concentrator system (500 MHz and 1500 MHz bands); Up to 60 simultaneous VF channels or up to 30 simultaneous data channels or a mix thereof. | up to 26.4 Kbps | Y | Y | Y | Y | Y | Y | Y(6*) | Y | Y | Y |
| High Capacity Radio Concentrator SWING V3.1 | TDMA point-to-multipoint radio concentrator system (500 MHz and 1500 MHz bands); Up to 60 simultaneous VF channels or up to 30 simultaneous data channels or a mix thereof. | up to 26.4 Kbps | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Single Channel Analogue Radio (SCARS) | Single channel point to point analogue radio. (150MHz and 400MHz) | up to 16.8 Kbps claimed | N | Y | Y | Y | N | N | N | Y | N | Y |
| NA100 Dual Channel Analogue Radio System (DCARS) | Dual channel point to point analogue radio. (150MHz and 400 MHz) | up to 9.6 Kbps | N | Y | Y | Y | N | N | N | Y | N | Y |
| SR210/310 Dual Channel Analogue Radio System (DCARS) | Dual channel point to point analogue radio. (150 MHz and 400 MHz) | up to 14.4 Kbps | N | Y | Y | Y | N | N | N | Y | N | Y |
| Hawk version 1 Dual Channel Analogue Radio System (DCARS) | Dual channel point to point analogue radio. (150 MHz, 400 and 450 MHz) | up to 19.2 Kbps | Y | Y | Y | Y | Y | Y | N | Y | N | Y |
| Hawk version 2 Dual Channel Analogue Radio System (DCARS) | Dual channel point to point analogue radio. (150MHz, 400 ,and 450 MHz) | up to 19.2 Kbps | Y | Y | Y | Y | Y | Y | Y(7*) | Y | N | Y |
| Multichannel Analogue Radio System (MCARS) | 6 channel point to point analogue radio (400 MHz & 900 MHz) | up to 14.4 Kbps | N | Y | Y | Y | Y | Y | N | Y | N | Y |

| Infrastructure Platform | Description | Dial-up Data Rate (1*) | Homeline Product Features (2*) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Call-Waiting | Call-Forward (9*) | Call-Barring | 3-way Chat | Call Back Busy | Call Back Busy | Calling Number Display (CND) | CND-Blocking | Faxstream Duet | Message-bank Home |
| Multichannel Digital Radio System (MCDRS) DXR200 | Point-to-point non concentrating digital multi-channel customer radio system sourced through NEC Australia but -manufactured by MAS Technology (NZ) (400 MHz, 900 MHz & 1500MHz) | up to 26.4 Kbps (with 64 Kbps encoding) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| CDMA Wireless Local Loop | WLL platform using CDMA base stations with a V5.2 switch interface from the Base Station Controller to the PSTN switch. (under development) (800 MHz) | up to 14.4 Kbps | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Fixed Radio Access (FRA) | Nortel Proximity I TDMA WLL system operating in 3.4 GHz band | up to 46.6 Kbps | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| **SATELLITE SYSTEMS** | | | | | | | | | | | | |
| USO Satellite Telephony (USOSat) | VSAT DAMA satellite telephony service - off PAS2 | up to 28.8 Kbps (8*) | N | Y | Y | N | N | N | N | Y | N | Y |
| RSS via Satellite | AXE RSS with satellite transmission - off PAS2 | up to 9.6 Kbps | Y | Y | Y | | | | Y | Y | | |
| IPSTS(MiniSat) | Interim telephone service using MiniSat technology on the Inmarsat satellite platform | up to 2.4 Kbps | N | N | N(5*) | N | N | N | N | N | N | N |
| **SMALL PAIR GAIN SYSTEMS** | | | | | | | | | | | | |
| Analogue Network Termination (ANT1) | Allows an ETSI Basic Rate service (OnRamp) to provide two analogue PSTN lines over one copper pair; used for2nd line (both services to same customer) | up to 50 Kbps | Y | Y | Y | N | N | N | Y | Y | N | N |
| 1+1 FM Carrier system | Uses FDM to combine a normal VF telephone service (physical service) with an extra service (carrier service) provided via an FM carrier service | up to 26.4 up to 9.6 on derived channel | Y | Y | Y | Y | Y | Y | N(13*) | Y | N(13*) | Y |
| 2 channel Digital Pair Gain System ( 2 DPGS) | Uses digital multiplexing to provide two telephone services over one physical cable pair - reactive solution (2B1Q DSL bearer = 2x64Kbps VF) | up to 19.2 Kbps Rel1 up to 28.8 Kbps Rel2 | Y | Y | Y | Y | Y | Y | Y(4*) | Y | Y(4*) | Y |

| Infrastructure Platform | Description | Dial-up Data Rate (1*) | Homeline Product Features (2*) | | | | | | | | | Message - bank Home |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Call-Waiting | Call-Forward (9*) | Call-Barring | 3-way Chat | Call Back Busy | Call Back Busy | Calling Number Display (CND) | CND-Blocking | Faxstream Duet | |
| 4 channel Digital Pair Gain System (4 DPGS) - Phase 1 | Uses digital multiplexing to provide four telephone services over one physical cable pair | up to 7.2 Kbps | Y | Y | Y | Y | Y | Y | N | Y | Y(4*) | Y |
| 4 channel Digital Pair Gain System (4 DPGS) - Phase 2 | Uses digital multiplexing to provide four tel servs over one physical cable pair - reactive solution (4B3T DSL bearer = 4x32Kbps ADPCM VF) | up to 7.2 Kbps | Y | Y | Y | Y | Y | Y | Y(3*)(4*) | Y | Y(4*) | Y |
| Rural Access Multiplexer Phase 1 (RAM Ph1) | 8 channel pair gain system (2 x 160Kbps 2B1Q) | up to 26.4 Kbps | Y | Y | Y | Y | Y | Y | Y(4*) | Y | Y(4*) | Y |
| Rural Access Multiplexer Phase 2 (RAM Ph2) | 8 channel pair gain system (1 x 528Kbps xDSL) 8 channel pair gain system (2 x 272Kbps xDSL) | up to 28.8 Kbps | Y | Y | Y | Y | Y | Y | Y(4*) | Y | Y(4*) | Y |
| **MEDIUM PAIR GAIN SYSTEMS** | | | | | | | | | | | | |
| Mini Line Concentrator (MLC) 14/5 | Up to 14 services over 5 cable pairs (trunks) | up to 50 Kbps | Y | Y | Y | Y | Y | Y | Y(4*)(10*) | Y | Y(4)(11*) | |
| Mini Line Concentrator (MLC) 15/6 | Share up to five cable pairs (trunks) to provide up 15 services. A sixth trunk provides the power feed & data communications to the remote unit. | up to 50 Kbps | Y | Y | Y | Y | Y | Y | Y(4*)(10*) | Y | Y(4)(11*) | Y |
| Mini Line Concentrator (MLC) 16/6 | Share up to five cable pairs (trunks) to provide up 16 services. A sixth trunk provides the power feed & data communications to the remote unit. | up to 50 Kbps | Y | Y | Y | Y | Y | Y | Y(4*)(10*) | Y | Y(4)(11*) | Y |
| **LARGE PAIR GAIN SYSTEMS** | | | | | | | | | | | | |
| Large Line Concentrator (LLC) - 16/96 | Combine a number of Extel MLCs via an extra switching stage (E2SS and R2SS) to provide up to 96 services over 15 trunks. 16th trunk used for data and power supply. | up to 50 Kbps | Y | Y | Y | Y | Y | Y | Y(4*)(10*) | Y | Y(4*)(11*) | Y |
| Remote Customer Multiplexer (RCM) | Multiplexes up to 30 tel services over a standard 2 Mbps digital link (4W, optical or radio) | up to 26.4 Kbps | Y | Y | Y | Y | Y | Y | N | Y | Y(4*) | Y |

| Infrastructure Platform | Description | Dial-up Data Rate (1*) | Homeline Product Features (2*) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Call-Waiting | Call-Forward (9*) | Call-Barring | 3-way Chat | Call Back Busy | Call Back Busy | Calling Number Display (CND) | CND-Blocking | Faxstream Duet | Message-bank Home |
| Digital Concentrator System (DCS-20) | Provides up to 120 services; Central Unit and Remote Unit interconnected by a variety of transmission schemes: cable pairs, 2Mbps PCM over copper, fibre or radio. | up to 26.4 Kbps | Y | Y | Y | Y | Y | Y | N | Y | Y(4*)(11*) | Y |
| Remote Integrated Multiplexer (RIM) | Provides up to 480 services over a number of standard 2 Mbps digital links to a maximum 34 Mbps. Integrated RIM - connects directly to the exchange via the digital links: Non-integrated RIM - indirectly connected to an exchange via the MDF using 2 wire circuits. | up to 26.4 Kbps (non-int.) up to 50 Kbps (int) | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Small Capacity Distributed System (SCaDS with O/F) | SCaDS is a digital pair gain system that can support up to 30 POTS or 12 ISDN services or a mix. Up to 6 cascaded remote units on a single bi-directional optical fibre bearer up to a maximum distance of 30km for each remote unit | up to 28.8 Kbps | Y | Y | Y | Y | Y | Y | Y(4*) | Y | Y(4*) | Y |
| SCaDS with G703 interface | Allows SCaDS to use existing G703 2 Mbps transmission capacity (including digital radio) | up to 28.8 Kbps | Y | Y | Y | Y | Y | Y | Y(4*) | Y | Y(4*) | Y |

(1) = Data rate capability not throughput. The numbers outlined here are indicative only. Factors influencing data speed include: distance of customer from their exchange; technology employed; quality of lines and interference encountered (noise levels, impedance matching); environmental factors; customer equipment (modem type, computer set-up, other equipment on the line); and carrier and ISP used by the customer (server capacity, compression techniques employed).

(2) = Product features may not be supported due to technology constraints, or when the technology is concatenated to another access technology.

(3) = CND inhibited after power fail fault until B-party has lifted off

(4) = Distinctive ring works satisfactorily provided PGS is not concatenated to another PGS, ie that has been used as an exchange replacement, eg RCM, DCS20, NIRIM.'

(5) = Call barring possible on IPSTS(MiniSat) during terminal set-up but cannot be changed remotely (of availability to be confirmed by Vendor.

6) = Calling Number Display will only function on ERS and ERS-C equipment. System software V10.3 or later must be used. Although Microstations and HBD equipment can be used with V10 systems CND will not work on Microstations or HBD terminal and repeaters.

(7) = Date (8) = Default data rate set at 14.4 Kbps; 28.8 kbps enabled with *28 prefix

(9) = EasyCall Call Forward includes Call Forward Immediate, Busy and No Answer

(10) = CND may not be passed to B-Party on unanswered call where concentrator is congested.

(11) = First ring cadence is corrupt

(12) = Untested

(13) = Untested

2.110  As the preceding table shows, some pair gain systems effectively limited dial-up speeds to 7.2 kbps while many others, including the common early Remote Integrated Multiplexers (RIMs) limited dial-up speeds to around 26.4 kbps.[117]  It was explained to the Committee that these limitations often relate to the number of analogue to digital conversions which occur when older systems are being used:

> … the bigger issue that impacts on data speeds is this factor of analogue-to-digital conversions that you get when you go through some of the access network electronics. Each time you go through an analogue-to-digital conversion you limit the achievable dial-up speeds. So if you have two conversions you are generally down to around the 30- to 28-kilobit per second level.
>
> Most of the pair gain systems that we have used for many years have those two analogue-to-digital conversions. The way we have approached that issue is that, with the advent of the Internet assistance program, we are advising customers to access that program. If they have issues around the data speed then they can be brought up to the achievable levels that they need by case-by-case attention. That is working quite well. We are actually achieving quite a lot of very positive outcomes for customers who go through the centre.118

2.111  Telstra also advised that the RAM 8 phase 3 pair gains system would soon enter service.  This system will offer 50 kilobit per second dial-up speeds and will be an important tool in further targeting some of the existing concentrator systems.[119]

2.112  The issue of whether customers whose dial-up speed was limited by a pair gain system should be paying less for their service was raised with representatives of the Consumer Telecommunications Network:

> I think they should be.  That is absolutely the case because it is quite clear they are never going to get something faster.  I must admit that I was a little bit disappointed with the recommendation in the Estens report that the guaranteed speed be 19.2 kilobytes per second, especially considering that the standard modem for dial-up even is a 56K modem.  The reality is that we know most of those modems are not going to get 56K and we can accept that, but perhaps 33.6 might be a more realistic speed that we are looking at.  At least at that point you can guarantee to get decent email with some

117  Telstra Corporation Limited, Submission 107D.

118  Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Committee Hansard, 7 August 2003, p 934.

119  ibid., p 923.

attachments, which is a bare bones basic service that you should be able to expect from an Internet service in Australia.[120]

### *Access to broadband*

2.113 The use of pair gains systems in the Telstra network also significantly impacts on the availability of ADSL. Telstra told the Committee that about 900,000 telephone services are currently provided through a RIM. Of those services, approximately 70 per cent are connected through exchanges which are ADSL enabled.[121] A significant number of Telstra customers are therefore unable to access ADSL services even though their exchange is ADSL enabled:

> Ozemail informed me that they regrettably can't provide a service as my new phone line was not put in by adding new copper pairs as I was informed, but by using a RIM system which is incompatible with ADSL. At no time was I informed by Telstra that this would be a problem in the future, if I wanted to upgrade to broadband.[122]

2.114 There sometimes seems to be some confusion, even from Telstra personnel, about the reason that ADSL is unavailable on a particular service. One customer recounted his experience in trying to obtain an ADSL connection:

> On 5 June I rang the 1800 151 311 number as per the advertisement in the Courier Mail to obtain my "faster affordable Internet experience", only to be told that, despite my close proximity to the centre of a large regional centre like Toowoomba, I was unable to obtain an ADSL connection because we have "a pair gain phone line system", and, "You can't expect to just ring up and get that sort of service like you would a telephone"
>
> I made contact with the electorate office of my local member of parliament and dealt with a very helpful aide who made contact with the local Telstra Countrywide office. One of the Countrywide staff then rang me back to correct some of the miss-information that I had been given during my previous telephone contact with Telstra. It appears that we have standard telephone lines, but are unable to access ADSL because we have a line length of 4800 metres, and the service will only reliably work up to a line length of 4000 metres from the telephone exchange.[123]

2.115 The Committee took up this issue with Telstra:

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120   Ms Teresa Corbin, Acting Executive Officer, Consumer Telecommunications Network, Committee Hansard, 28 November 2002, p 203.

121   Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p 887.

122   Mr Chris Tangey, Submission 35.

123   Mr Geoff Thompson, Thompson Consulting Engineers Pty Ltd, Submission 1, p 2.

> The short answer to your question about the RIMs is that we are actually no longer deploying RIMs. We have stopped that. We do not buy them anymore. They are not manufactured anymore. We are now deploying CMUX technology, and the CMUX-AU is the version of the CMUX that is designed to take up from where the RIM was formerly utilised. It is a device that handles the same sort of capacity of PSTN and ISDN that RIMs were able to provide for, but it has also been designed to provide broadband capability to a percentage of the customers in that area. Those devices have been deployed from earlier this year - early in the first half of this year - but when we first got access to the technology from the vendor it only had PSTN capability. ISDN was proven in a pilot phase, and that is now available in the market. The broadband capability of the CMUX-AU is being piloted this month in one exchange area of Queensland. Subject to that being a straightforward exercise, which we are reasonably confident it should be, we will have the broadband capability available in the new subdivisions in which we deploy these devices[124]

2.116 After this statement became the cause of some press discussion based on apparently contradictory evidence given by the company's representatives at another Senate committee inquiry, Telstra advised the Committee that some RIMs were still being deployed in special circumstances.

2.117 Telstra also advised the Committee that it was trialling a miniMUX system which could be fitted to an existing RIM to provide a limited number of broadband connections. A miniMUX provides 24 ports for ADSL and up to two miniMUXs can be installed in a RIM. The installation of a miniMUX is, however, dependent upon there being both sufficient demand and space to install the equipment in the RIM cabinet. Telstra outlined the status of the trials for the Committee:

> This relates to a pilot period of assessment of miniMUX capabilities and the processes that relate to Telstra's provisioning and maintenance of wholesale and retail services through these miniMUX devices. We instituted a trial in four RIM areas in the Crace exchange area in Gungahlin and surrounding suburbs early this year. We later extended that trial to encompass another six exchanges, three of which were in the Townsville area and three of which were in the Castle Hill/Kellyville area in north-west suburban Sydney.

> Part of the reason for the trial—there were a couple of reasons, really—is that there were some technical aspects of the performance of miniMUX inside a closed cabinet out in the street environment in relation to heat loading and so on that had to be assessed. There are four different types of RIM cabinets. Each one is slightly different, so the mechanics and physical performance had to be checked. That has proceeded to our satisfaction in that technical sense.

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124 Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p 916.

> The integration of our provisioning processes and our maintenance processes has been worked through and tested in the different areas, so there is no issue in respect of where a miniMUX might be. We have a performance guarantee period for new technology that we then implement so that our operational part of the company is well satisfied they can operate that equipment well. That period comes to an end this week, so we are expecting formally to complete the trial and begin the commercial deployment of miniMUXs where it is appropriate, from this point on.[125]

2.118 Telstra advised the Committee that other methods of addressing the problems posed by pair gain systems have been to use one CMUX to provide ADSL services in an area with RIMs or to use available copper in the same area.

### *Response to the Regional Telecommunications Inquiry*

2.119 The Regional Telecommunications Inquiry (RTI) recommended that Telstra should give a formal undertaking to the Government including providing timeframes in relation to any action required to implement a strategy for improving the quality of telephone service affected by the use of 6/16 and similar pair gain systems.[126] In response to this recommendation the Government said that Telstra would provide it with a formal undertaking on 'its strategy, including timeframes, to improve, as soon as possible, phone services affected by the use of 6/16 and similar pair gain systems'.[127] An undertaking on this issue was signed by Telstra and the Commonwealth on 18 December 2003.

2.120 Subsequent examination of the undertaking between Telstra and the Government and questioning of Telstra during estimates hearings has exposed the limitations of the undertaking. The undertaking between Telstra and the Government deals only with problems of congestion on 6/16 and similar pair gain systems. It does not address the issue of the inability of these systems to provide access to ADSL, or to the same level of service in relation to calling number display and faxstream services[128] as other customers enjoy. When Telstra was asked whether it was only removing these systems when services degrade to a point that it is not a quality service a Telstra representative replied that:

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125   Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Proof Committee Hansard, 7 August 2003, p 914.

126   Regional Telecommunications Inquiry, Connecting Regional Australia, November 2002, p XV.

127   The Government's response to the recommendations of the Regional Telecommunications Inquiry, http://www.dcita.gov.au

128   Telstra Corporation Limited, Submission 107d.

> We remove them when there is a very clearly agreed set of criteria based around the congestion performance.[129]

2.121  The RTI also recommended that:

> Recommendation 4.2
>
> Telstra should be required to demonstrate that it has an effective strategy to address any dial-up data speed issues arising from poorly performing pair gain systems. Telstra should provide a formal undertaking to the Government in relation to any actions necessary to implement such as strategy.[130]

2.122  At the time that this report was being prepared the Government had not secured such an undertaking.

2.123  Telstra has indicated that it is phasing out the older systems and that the newer systems being used have greater capabilities. During the final hearing on this inquiry on 7 August 2003 Telstra advised the Committee that, for example, it is phasing out the 6x16 medium line concentrators and that last year 520 of those systems had been removed.[131] More recently Telstra has stated that it has removed 670 of these systems and that about 5,600 remain:[132]

> The use of the network reliability framework now clearly identifies where there are problems in the network, and then the remedial plans will go accordingly. If during that process we have identified that a pair gain system, whether it is large or small, is the cause of a problem from a customer perspective, that is where those plans will be built. That is the way we will prioritise it.[133]
>
> We do not have specific time frames against specific types of pair gain systems, except to say that all the older systems - and I would refute the term 'archaic'; they are just older - are all decreasing in their installed base,

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129  Environment, Communication, Information Technology and the Arts Legislation Committee, Additional Estimates, Proof Committee Hansard, 16 February 2004, p 104.

130  Regional Telecommunications Inquiry, Connecting Regional Australia, November 2002, p 235.

131  Mr Denis Mullane, Manager, BigPond Network Capability, Telstra, Official Committee Hansard, 7 August 2003, p 861 - 863.

132  Environment, Communication, Information Technology and the Arts Legislation Committee, Additional Estimates, Proof Committee Hansard, 16 February 2004, p 104.

133  Mr Anthony Rix, Head, Service Advantage, Telstra, Official Committee Hansard, 7 August 2003, p 922.

every one of them. I will mention that the 1+1 FM system has basically gone in the last year.[134]

2.124 In the Committee's view the continued use of outdated pair gain systems which impede access to services is not acceptable. Customers should be entitled to know if the level of service on their line is affected by the presence of pair gain systems and these systems should be phased out as soon as possible.

## Payphones

2.125 As the current Universal Service Provider, Telstra is required to ensure that payphones are reasonably accessible to all people in Australia on an equitable basis, wherever they reside or carry on business.[135] Payphones are also provided by other private operators, however. Concerns were raised with the Committee about the availability of payphones and some aspects of their operation.

> I live just 100ks from Melbourne, Half way between Ballarat and Daylesford, ….
>
> Recently Telstra opted to remove the nearest Public Phone which was 6ks from our home and we now have to travel to Creswick 17ks away to use a Public Phone to report any faults with our home phone. A fairly frequent occurrence in this area. So much for increasing services to Country people.[136]

2.126 And:

> Council is also concerned about telephone access at major tourist attractions. In this Shire, there are major water sport/recreation facilities that are widely used by locals and tourists alike. Unfortunately, should there be an accident, there is no public telephone (or mobile phone) access at the lake, so making emergency communication difficult.[137]

2.127 Concerns were also raised about payphones not giving change.[138]

2.128 Following the conclusion of the Committee's hearing program, the Australian Communications Authority reported to the Minister for Communications, Information Technology and the Arts on its review of the provision of payphones in Australia. In relation to the adequacy of payphone services the ACA found that:

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134 Mr Denis Mullane, Manager, Bigpond Network Capability, Telstra, Official Committee Hansard, 7 August 2003, p 923.

135 *Telecommunications (Consumer Protection and Service Standards) Act 1999*, section 19(1).

136 Ms Lorraine Boyd, Submission 7.

137 Aramac Shire Council, Submission 60.

138 Mr Peter Hanson, Submission 28.

> … existing payphone services in Australia are reasonably adequate and overall customer satisfaction is rising. In particular, the number of public payphones remains fairly stable.[139]

2.129 However, the ACA raised concerns about the reliability of Telstra's payphones and its fault repair performance:

> … the overall reliability of Telstra's payphones and its fault repair performance is poor in remote Australia, especially but not only in remote indigenous communities. There are steps that Telstra can and should undertake to improve the reliability of its payphones. The ACA will undertake closer monitoring of USO performance by Telstra in these target areas.[140]

2.130 The ACA made a total of thirty three recommendations aimed at improving payphone services, particularly for indigenous Australians and people with a disability, improving processes for determining the location of payphones, and improving Telstra's fault repair performance with regard to payphones. As the ACA's report was released after the conclusion of the Committee's public hearing program, the Committee has not had an opportunity to examine its findings or to seek comments on them from interested parties. The Committee has not, therefore, reached any conclusions nor made any recommendations following on from ACA's recommendations. Its findings in relation to people with a disability are discussed in the following section.

## Services for people with disabilities

### *Legislative requirements*

2.131 People with disabilities often require special equipment to allow them to access the telecommunications network. The *Telecommunications (Consumer Protection and Service Standards) Act 1999* requires that the supply of a standard telephone service by the universal service provider, currently Telstra, include the supply of other equipment to people with disabilities, such as access to mobile phones and telephone access at public venues, in order to comply with the provisions of the *Disability Discrimination Act 1992*.

2.132 Several witnesses suggested that the current regulatory regime does not adequately address the changes occurring in telecommunications in Australia, that existing telecommunications legislation should be reviewed to ensure that it reflects new developments in technology, and that the resulting services on offer to the general public remain accessible to people with disabilities:

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139   Australian Communications Authority, *Payphone Policy Review*, p 1.

140   ibid., p 2.

> As alternative telecommunications technologies are introduced, it is time to ensure that the quality and safety standards that Australians expect are not eroded. Telecommunications legislation needs to accurately reflect the broader obligations of telecommunications companies, especially in relation to the needs of people with a disability.[141]

> But I do believe that it is time to go back and review the legislation, to look at the definition of a standard telephone and at how we define the obligation to provide access for people with disabilities and to make sure that these kinds of black holes do not occur in the future. One of the ironies is that the previous legislation is basically technology specific. We need technology neutral legislation which enshrines the basic right of access to telecommunications for people with disabilities. 'That is our primary recommendation to you.[142]

2.133 A similar plea was made in other submissions with respect to consumers more generally and not just those with a disability.[143]

2.134 Australian Communication Exchange Ltd (ACE) provides the National Relay Service on behalf of the Commonwealth Government. The service exists under legislation to provide telecommunications access for people with disabilities, particularly people who are deaf or have hearing or speech impairments. It is a vital and important service, as it gives people who would otherwise be denied access to the network the ability to communicate with the general community. ACE submitted[144] that the introduction of wireless local loop (WLL) in regional and rural areas places Telstra in breach of its USO, because the technology is incompatible for Teletypewriter (TTY) users and thus effectively reduces their communication options in comparison to with those of the general public. The Australian Communications Authority disagrees, however, considering that Telstra's approach to rolling out CDMA WLL services 'will fulfil Telstra's obligations under the USO and the Determination.' The Authority did acknowledge, however, that emerging technologies could possibly require changes to regulatory requirements.[145]

## *Disability Equipment Program*

2.135 Equipment for people with disabilities is usually provided at present through the Disability Equipment Program (DEP) operated by Telstra and provided as part of

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141    Australian Communication Exchange Ltd, Submission 65, p 8.

142    Mr Leonard Bytheway, Australian Communication Exchange Ltd, Committee Hansard, 28 November 2002, p 245.

143    See, for example, Consumers' Telecommunications Network, Submission 88, pp 7-8.

144    Australian Communication Exchange Ltd, Submission 65, pp 6-7.

145    See letter from Australian Communications Authority to Australian Communication Exchange, Submission 65, Appendix A.

its Universal Service Obligations (USO).  This program was criticised by a number of witnesses representing people with disabilities.

2.136  First, they were concerned that the DEP is offered solely by Telstra (although Optus provides some equipment for customers using the Optus cable).  Consequently, it was suggested that people with disabilities are being denied the full choice of telecommunications services and the full advantages of competition policy.[146]

2.137  Second, it was claimed that only limited equipment is available through the DEP, it is chosen solely by Telstra and much of it is dated:

> In some respects the protection of our entitlements has become 'fossilised' at the technology stage we had reached in 1997. Equipment for people with disabilities has not kept up with new technologies, and in some respects people needing adaptive devices are now further isolated than they were ten years ago, despite the enormous potential of new communications technologies to overcome the barriers of disability.[147]

2.138  Some submitters expressed concern that Telstra was able to vet access to the DEP:

> To get equipment from Telstra I have to get a doctor's signature, which seems quite reasonable, but then I have to be vetted by the operator at the disability inquiry hotline. What knowledge do those operators have of hearing loss or any other disability? [148]

2.139  To overcome these concerns, a number of disability representatives suggested that the DEP should be independent of Telstra, or indeed of any carrier:

> … an independently run disability equipment program would be really important. The consumers would be free to go to it, and they would not need to have a Telstra standard line into their home.[149]

> The comment from the whole of the disability sector is: why do Telstra, or any other carrier, choose which equipment is available and which is not? That is why we believe the independent solution is the best, both for vetting

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146    Deafness Forum of Australia, Submission 40, p 3.

147    Consumers' Telecommunications Network, Submission 88, p 9.

148    Mr Andrew Stewart, Deafness Forum of Australia, Committee Hansard, 28 November 2002, p 183.

149    Mr Harold Hartfield, Physical Disability Council of Australia Ltd, Committee Hansard, 30 April 2003, p 515.

and for the supply of equipment, so it can be decided on fairly what should be on the equipment list and it should be allocated fairly and reasonably.[150]

2.140  Attached to the submission from the Deafness Forum of Australia was a paper by TEDICORE (Telecommunications and Disability Consumer Representation) outlining the following key principles for such a program:

- the program be consumer-focussed and managed;

- equitable access to the Internet and mobile telephony be considered an integral part of access to telecommunications;

- user needs with regard to new telecommunications technologies be taken into account;

- telecommunications products and services to be based on the principles of inclusive design where possible, with specialised products to be compatible with, and easily connected to, mainstream products; and

- the program be based on principles of social justice from the Universal Declaration on Human Rights - 1948 and the United Nations Declaration on the Rights of Disabled persons.[151]

2.141 TEDICORE favoured the introduction of a public procurement policy for disability equipment to facilitate the access of people with disabilities to appropriate telecommunications equipment:

> … we really would like to see a big change in the way disability equipment is provided under an independently run program.

> …We consider that that [public procurement] is a very important issue that we would like to continue stressing as a way of encouraging more accessible equipment being available in Australia – through the government taking a proactive role by ensuring that it specified in its public procurement policy that it would prefer tenders which included accessible equipment, as is happening in the United States at the moment.[152]

2.142 Telstra disputed claims that the company offered only a limited choice of equipment to people with disabilities:

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150   Mr Andrew Stewart, Deafness Forum of Australia, Committee Hansard, 28 November 2002, p 186.

151   TEDICORE. Key principles of proposed Disability Telecommunication Program, Deafness Forum of Australia, Submission 40, Appendix 2, p 37.

152   Ms Gunela Astbrink, Telecommunications and Disability Consumer Representation, Committee Hansard, 30 April 2003, p 508.

> Our view is that we do offer a comprehensive range of equipment that you [the disabled] can get through the program and we do … undertake our customer satisfaction surveys to ensure that the equipment we provide to customers is meeting their needs and expectations.[153]

2.143 Its representatives advised the Committee that Telstra had recently revised its catalogue of products and services for people with a disability and they provided the Committee with a copy.[154] They also outlined some of the steps Telstra is taking to improve the range of equipment available for people with a disability:

> More recently we have announced Braille and large visual display TTYs— that is in a flier that we circulated amongst the deaf and/or blind community; we launched that not very long ago—so the equipment program has been expanded. As well as that we are developing a multifeatured disability phone. In the hearings you would have heard that perhaps a big button phone would be useful for some customers. We recognise that and that is what we are working on. We hope to have it available late this year. We are certainly working hard to achieve that time line.[155]

2.144 Telstra representatives also informed the Committee that it had established a wholesale program which would allow other service providers to offer disability equipment to their customers:

> Telstra Wholesale established a disability equipment program in January 2003, so this is a fairly new initiative. It allows service providers to supply specialised telephone disability equipment to eligible customers in order for them to access the standard telephone service. Under this wholesale program, the full range of disability equipment that is available through Telstra's program is also available to those service providers who might want to offer that service to their own end users—that is, their own customers. Telstra has established a disability wholesale help desk for the service providers.

> …Since that program was established—and I again say it was just at the beginning of this year—it has received about 650 calls and has processed 37 applications on behalf of service providers.[156]

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153   Ms Margaret Portelli, Group Manager, Consumer Affairs, Telstra, Proof Committee Hansard, 6 August 2003, p 825.

154   ibid.

155   ibid.

156   ibid., pp 819- 820.

*Existing telecommunications equipment and services*

*Access to phones, payphones and TTYs*

2.145 Many people who are deaf or hearing impaired rely on a teletypewriter (TTY)[157] to communicate. Their opportunities for full communication are limited by the number of TTYs located in public places:[158]

> …if it is necessary for a particular individual to be issued with a TTY for use in the home then clearly it is necessary for that person to have access to TTYs wherever they go. This means that TTYs should be provided as necessary as part of the Australian communications network.[159]

2.146 This is a particular concern in the case of emergency calls:

> One particular area of concern relates to emergency call services. While the emergency call service number 106 has been established as an alternative to 000 for TTY users, that does not solve the problem if the telephone service does not support TTYs … problems arise for TTY users when they are away from home where they have a TTY.[160]

2.147 The Australian Communications Exchange referred to the TTY technology used by people with disabilities in Australia as 'end of life' technology, isolating people from developments elsewhere:

> Teletype devices were literally recovered from disuse in the late 1960s and refurbished and modified to become the first TTYs used by deaf people. Deaf people chose an 'end of life' technology as their platform because it was available, cheap and it worked. TTYs in current use in Australia have a very similar form factor to those introduced in Australia in 1980.
>
> …Thus Australia is a 'TTY island' using a system not deployed extensively anywhere else in the world.[161]

2.148 Other hearing impaired people rely on volume control on their phones. Few public payphones have volume control. These are therefore inaccessible to hearing impaired people:

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157 Using this system a deaf person may converse over the phone line through the medium of a keyboard, screen and printer.

158 There are 171 across Australia according to Mr Andrew Stewart, Deafness Forum of Australia, Committee Hansard, 28 November 2002, p 188.

159 Deafness Forum of Australia, Submission 40, p 4.

160 ibid., p 5.

161 Australian Communication Exchange, Submission 65, p 9.

> One of the major problems for Australians with a hearing/deafness disability is the lack of access to volume control voice phones when away from their homes. If it is necessary for a particular individual to be issued with a volume control voice phone with a hearing aid coupler for use in the home, then clearly it is necessary for that person to have access to volume control voice phones with hearing aid couplers wherever they go.[162]

2.149 It was suggested that increasing the availability of volume control would transform the lives of many hearing impaired people:

> The simple addition of volume controls would make all the difference to the ability of hearing impaired people to move freely around the world. We talk a lot about TTYs, which are vital and high-tech, but simple volume controls would change the quality of life of millions in Australia.[163]

2.150 Even where available, the volume control on public phones in Australia is inadequate for people with significant hearing loss, and inferior to the volume control available in some other countries:

> Unfortunately, saying that payphones should have volume control is not sufficient. The loudest volume available on existing payphones in Australia is insufficient for anyone with close to severe hearing loss and is well below the "best" overseas payphones.[164]

2.151 Access to payphones by people with physical disabilities can also be limited by their location and their height, which may place them beyond the reach of people in wheelchairs:

> The height and access to payphones continue to cause significant concern to people with physical disabilities. Many payphones are still not accessible in terms of height, and in terms of being able to gain access to the phone itself, particularly for those with limited upper limb dexterity.[165]

2.152 Concern was also expressed that deaf and hearing impaired people relying on TTYs were adversely affected by the phasing out of the analogue mobile phone service network and its replacement by GSM and CDMA phones. Currently they cannot use their TTYs to communicate by mobile phone, a significant limitation given that there are now more mobile phone connections than fixed line connections in Australia:

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162    Deafness Forum of Australia, Submission 40, p 4.

163    Ms Margaret Robertson, Deafness forum of Australia, Committee Hansard, 28 November 2002, p 189.

164    Deafness Forum of Australia, Submission 40, p 4.

165    Mr Harold Hartfield, Physical Disability Council of Australia Ltd, Committee Hansard, 30 April 2003, p 508.

Both GSM and CDMA phones effectively garbled the signal of the TTY when it was sent across the telephone network, and they have lost that access… We are saying that a large number of people in Australia who rely on text telephony are not able to get access to over half the network.[166]

2.153 While deaf and hearing impaired consumers can, and do, make use of mobile phones for text messaging, cost is claimed to be an issue for many.[167] Because of these developments it was suggested by some witnesses[168] that the quality of access to equipment and services by people with disabilities has been substantially degraded over the last five years. Others stressed the importance of ensuring that future developments do not similarly disadvantage people with disabilities:

Let us look at what is going on in technology and make sure that deaf and hearing impaired people's interests are considered first, not afterwards, when they have to make complaints through the DDA to get their needs met.[169]

*Closure of aged and disability centres*

2.154 A number of witnesses commented on the adverse impact of Telstra's closure in 2003 of its six aged and disability centres. These were said to have played an important role in informing consumers with disabilities of the range of equipment available and in advising them, generally on a one-to-one basis and often in their homes, of the equipment best suited to their needs. It was claimed that the centres were closed without consultation with the disability sector. They have been replaced by a disability hotline, an inadequate substitute in the view of some witnesses:

The alternative arrangements put in place by Telstra are not satisfactory. The use of the Telstra disability hotline – a telephone service – as the primary source of assistance for people with disabilities is not really a satisfactory substitute for the human contact of a telecommunications expert matching the needs of a person with a physical disability. As a principal provider of disability equipment, this particular move by Telstra to close the centres is deeply regretted by the disability community.[170]

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166   Mr Leonard Bytheway, Australian Communication Exchange, Committee Hansard, 28 November 2002, p 242.

167    See, for example, Australian Association of the Deaf, Submission 68, pp 3-4; Consumers' Telecommunications Network, Submission 88, p 12.

168   Mr Leonard Bytheway, Australian Communication Exchange, Committee Hansard, 28 November 2002, p 244

169   Ms Margaret Robertson, Deafness Forum of Australia, Committee Hansard, 28 November 2002, p 182.

170   Mr Harold Hartfield, Physical Disability Council of Australia Ltd, Committee Hansard, 30 April 2003, p 510.

*Telstra response*

2.155  Telstra representatives advised that the closure of its aged and disability centres was prompted by their lack of support in the disability sector:

> The reason we closed these centres is that we found that they in fact were not being used very frequently.  On average we had about three visits per week to these centres.  It seemed to us that we were not in fact meeting the needs of people with a disability. … We have now changed our approach so that, for all intents and purposes, we are turning almost every Telstra shop into a shop whereby people with a disability will be able to get the sort of advice they need about what might be available for them. [171]

2.156 However, they did acknowledge that there was inadequate consultation with the sector about these closures:

> We did brief them prior to the closure but I think their criticism in terms of perhaps the haste in which it was done is something that we recognise. Certainly, we did receive some criticism about the lack of consultation that occurred over the closures.[172]

2.157  Telstra drew the Committee's attention to the steps being taken to address these issues,[173] primarily through its third Disability Action Plan.[174]  Telstra has an ongoing program to review the location of TTY payphones and to investigate the feasibility of a robust TTY payphone attachment for outdoor locations.[175]

2.158 In October 2000 a major research program on physical payphone access commenced under the guidance of an independent steering committee.  Telstra stated that it now has an ongoing program to ensure that payphones are mounted in accordance with the findings of that research.  Telstra is trying to promote awareness of access requirements among suppliers and commercial site owners for both wheelchair users and the visually impaired.[176]  The Disability Action Plan also states

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171  Mr Bill Scales, Group Managing Director, Regulatory, Corporate and Human Relations, Telstra, Proof Committee Hansard, 6 August 2003, p 825.

172  Ms Margaret Portelli, Group Manager, Consumer Affairs, Telstra, Proof Committee Hansard, 6 August 2003, p 826.

173  ibid., p 827.

174  Telstra, *Telstra's Third Disability Action Plan 2002-2004*.

175  ibid., pp 16 - 17.

176  Ms Margaret Portelli, Group Manager, Consumer Affairs, Telstra, Proof Committee Hansard, 6 August 2003, p 827. *Telstra's Third Disability Action Plan. 2002-2004*, Telstra, p 16 - 17.

that payphones are being upgraded with an in-built hearing aid coupling device, volume control feature, language selection and large visual displays.[177]

2.159 Telstra representatives explained that, to overcome the problems faced by TTY users in accessing the mobile phone network since the phasing out of the analogue network, they will be offering alternative TTY accessible technology. This may take the form of the old copper wire service or radio with TTY capability.[178]

## *Developments in telecommunications equipment and service*

2.160 Concerns were raised by a number of witnesses about the potential for new technology and convergence to overlook the needs of people with disabilities, as happened in the move away from the analogue network (as was discussed above). As mentioned above in the context of Telstra's universal service obligations, particular anxiety was expressed in relation to Telstra's current consideration of the deployment of a wireless local loop (WLL) in regional and remote areas, as this technology is not accessible to TTY users:

> The TTYs currently available in Australia will not work with a wireless local loop so access to the standard telephone service for Deaf people and people with a hearing or speech impairment will currently not be possible in an area serviced by a wireless local loop.[179]

> Telstra has made it clear, and for what I believe are quite reasonable business purposes, that is will be rolling out CDMA wireless local loop in a range of scenarios as the standard telephone service. … The quickest, easiest and cheapest way of getting networks rolled out there is to use wireless local loop. Wireless local loop is based on CDMA. It is not accessible for people with disabilities. So all of a sudden we are having whole chunks of our network cut out. We are basically punching black holes in that network for people with disabilities, which is not insignificant.[180]

2.161 Telstra has said that where wireless local loop is installed, the company will meet its obligations to people with disabilities by offering an alternate technology to residences and workplaces where there is a deaf or hearing impaired resident or worker. In the view of the disability sector this is an inadequate response since it will not take account of the future needs of people with disabilities who move their residence or workplace. Nor will it allow these people to access telephones outside

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177    Telstra, *Telstra's Third Disability Action Plan 2002-2004*, Telstra, p 16.

178    The options are discussed by Mr Don Pinel, Regional Managing Director, Queensland, Telstra Country Wide, Telstra, Proof Committee Hansard, 6 August, p 821.

179    Australian Communication Exchange Ltd, Submission 65, p 6.

180    Mr Leonard Bytheway, Australian Communication Exchange Ltd, Committee Hansard, 28 November 2002, p 242.

their homes or workplaces, a service available to every other member of the general public. It was argued that, therefore, such an approach represents an abrogation of the major carriers' responsibilities under the USO, as well as the requirements of the DDA.[181]

2.162 A further concern for people with disabilities is the roll-out of telephony using Internet Protocol, which is being progressively introduced into universities and some major public organisations such as CSIRO. This is also incompatible with TTYs:

> It [Internet telephony or IP telephony] looks and feels like a regular telephone. It has a number. You pick it up, you dial and it works. But it does not work with TTY. In fact, it will not work with any modulated modem type device. So again, we are now looking at areas the size of cities, whole universities – in fact, not just some but nearly all universities – losing their ability to be accessed by people with disabilities. So we now have a serious hole emerging in the telecommunications network for people with disabilities.[182]

2.163 The Australian Communication Exchange advocated the extension of the 'any to any' connectivity now operating in relation to voice telephone services to text and video connectivity. These options will become more viable with developing broadband technologies. 'Any to any' video connectivity will be especially valuable for deaf people who use Sign language as their first language:

> Deaf people who use Auslan would also prefer to use it when communicating on the phone. With the growing introduction of videotelephony (video conferencing, videophones and Video over Internet Protocol) and roll-out of broadband, there is now every opportunity for Deaf people to at last use their preferred language to communicate over the Australian network.[183]

2.164 Some witnesses suggested that the benefits of the technology may be limited for some people with disabilities by the cost of the equipment required:

> Consumers with a disability have a heavy reliance on telecommunications equipment and the increased impost [of Telstra's recent price rises] makes it increasingly difficult to remain connected. The problem is even worse for consumers in rural and remote areas.[184]

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181 See Australian Communication Exchange Ltd, Submission 65, pp 6-9 for a discussion of this issue.

182 Mr Leonard Bytheway, Australian Communication Exchange Ltd, Committee Hansard, 28 November 2002, p 244.

183 Australian Association of the Deaf, Submission 68, p 7.

184 Mr Harold Hartfield, Physical Disability Council of Australia Ltd, Committee Hansard, 30 April 2003, p 110.

2.165 Telstra representatives advised the Committee that the organisation is conscious of the potential for new technology to adversely impact upon people with disabilities if their needs are not adequately considered during the development phase. To prevent such an eventuality Telstra has ongoing discussions with the disability sector:

> …what we are always battling with in this area is that it is moving as rapidly as it is.  That includes how to make sure that we are providing people with a disability with the ability to link into that new technology at the same time as it is being rolled out.  We are very conscious of the fact that the disability community in general see this as being a very important point of principle.[185]

2.166 Telstra witnesses acknowledged, however, that its efforts are not always successful:

> But to be absolutely honest with the committee, it is not always possible to do that, so we sometimes get into this dilemma of not knowing how long one can delay the roll-out of a technology that is required by the community at large, because one does not have available to an important part of the community a corresponding technology which will meet their needs. .. We try to work in advance of these new technologies, so it coincides with their introduction, but it is not always possible.[186]

2.167 They also pointed to the need, in developing new technologies, for Telstra to respond to demand rather than anticipating it:

> Another assumption seems to be … that Telstra can and should provide the infrastructure necessary to deliver the latest technology before genuine demand has been established for the services provided by this technology. I think we have to say that all organisations – whether they are public, private or even not-for-profit - must ensure that their investments are somehow, to the best that they can manage them, synchronised with demand for their goods and services.[187]

2.168 Telstra is aware of concerns by disability advocates that developments in 'any to any' connectivity might not adequately address their needs.  It has established a Working Group to look at options and consumers and disability advocates are represented on that Group.[188]  Telstra says that it is investing heavily in the broadband infrastructure necessary to support 'any to any' connectivity in text and video, having

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185   Mr Bill Scales, Group Managing Director, Regulatory, Corporate and Human Relations, Telstra, Proof Committee Hansard, 6 August 2003, p 822.

186   ibid.

187   ibid., p 830.

188   For further details see Proof Committee Hansard, 6 August 2003, pp 2-3.

spent $1 billion to date, with an additional $1 billion to be allocated over the next five years.

*Payphone policy review*

2.169  On 31 March 2004 the Government released the ACA's report on its review of the provision of payphones in Australia.[189]  The ACA recommended that:

3.  The payphone industry and disability peak bodies should consult through an Australian communication Industry Forum (ACIF) working group, and work together to develop a Payphone Accessibility Code for endorsement by HREOC.  Australian Local Government Association (ALGA) and the Property Council should be invited to be involved in this ACIF group.  The group should look for approaches that:

- maximise reasonable accessibility for people with a disability;

- are flexible enough so as not to inhibit the overall provision of public and private payphones; and

- provide certainty to payphone operators that they have met their obligations under the Disability Discrimination Act.

4.  Telstra should continue to increase teletypewriter (TTY) payphone numbers in secure locations where there is evidence of need and TriTel and other specialist payphone firms should, at a minimum, provide TTY payphones in private sites when an agreement with the site owner requires Telstra to remove a TTY payphone.  TTY siting criteria could be discussed in the proposed ACIF working group.  The ACIF working group should also propose a means of providing comprehensive information about the location of TTY payphones.  TTY payphones also need clear instructions displayed to explain how to use them.[190]

2.170  The Committee has not had the opportunity to examine the detail of these proposals.  However, they are consistent with the evidence which was received by the Committee during its hearings and it supports the general thrust of the ACA's recommendations.

*Summary*

2.171  The Committee firmly believes that adequate communications are as important, if not more important, for the disabled as they are for the able-bodied.  While there are telecommunications issues affecting the able-bodied who live in rural and remote

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189   Australian Communications Authority, *Payphone Policy Review*, 20 February 2004.

190   ibid., p 5.

areas which could be expected to be even more challenging for the disabled, the Committee was disturbed to learn that new technology represents an issue for the disabled even in major urban areas. The Committee also recognises the challenges for telecommunications providers to give appropriate priority to the needs of the disabled in such a rapidly changing environment, while noting that new technology has an inherent capacity to provide solutions.

2.172 In the Committee's view there is a strong case for the development of an independent disability equipment program. This would allow telecommunications users who are affected by a disability to access a service from a wider range of service providers and give them greater control over what equipment should be available.

2.173 The Committee accepts Telstra's argument that the closure of its aged and disability centres was justified by their limited use, but expresses its disappointment at the poor manner in which the closure was handled. Apart from these issues, the Committee is satisfied that the needs of the disabled are generally receiving appropriate attention. There is no doubt, however, that such attention would be diminished in a fully competitive market without a continuing system of government regulation, with telecommunications providers aiming at ever lowered costs, rather than the provision of services which might not be justified on a fully commercial basis.

## Priority services

2.174 The background and operation of Telstra's priority assistance service is outlined in Appendix 5. However, that program only extends to Telstra's network. During the Committee's hearings this issue was discussed by Telstra:

> …. you may be aware of what is described as the Priority Assistance Program, which is a program set up to enable us to meet the needs of customers who might have a life-threatening illness. Whilst that program is particular to Telstra at the moment, the government has asked other providers to consider making the same service available to their customers. There is quite a bit of discussion going on within the industry about how that might be done in a way which does not necessitate the government putting into place a licence condition on them to ensure that it happens.191

## Mobile networks

2.175 The availability of mobile phone coverage was raised as an issue in many of the submissions received by the Committee. Most of the evidence which expressed concern about the extent of mobile coverage was received from, or related to, rural,

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191 Mr Bill Scales, Group Managing Director, Regulatory Corporate and Human Relations, Telstra, Committee Hansard, 6 August 2003, 820.

regional and remote areas. Much of this evidence came from local government bodies or organisations.[192]  Some examples will suffice to give the picture:

> Approximately 30% of our Council area is without Digital Mobile Phone Services.  This includes the Townships of Swan Reach, Walker Flat, Purnong, Bowhill, Murbko, Mt. Mary, Keyneton, Tungkillo, parts of Palmer and the eastern Mount Lofty Ranges within our area (except adjacent to the Sturt Highway).[193]

> That their mobile phones work EVERYWHERE and not only in certain areas so that when driving twenty kilometres the services appears and disappears.[194]

> Our mobile phones continue to drop out in this area especially when travelling to and from Coffs Harbour. There are quite a few black spots around the area and we have purchased a CDMA phone to try and overcome the problem but still find that the phone drops out at certain spots.[195]

> I live just 100ks from Melbourne, half way between Ballarat and Daylesford, we have never had a mobile phone service here and our mobile phones are only used when we are away from home. Service between our home at Ballarat are intermittent even when we are travelling toward Ballarat and Telstra readily admit to this.[196]

2.176 Concerns about the possible consequence of inadequate mobile coverage related not only to business and social needs, but also to the ability to seek help in the case of emergencies:

> A recent tragic incident near the Scott River district south of Nannup illustrated this dramatically when a father and husband was unable to call for help when his wife and sons were swept from rocks into the sea.[197]

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192　See also: Parry Shire Council, Submission 23; Jill White, Submission 25; Joanne Johnston, Submission 27; Peter Kane, Submission 29; Roslyn Joseph, Submission 32; Crookwell Shire Council, Submission 34; District Council of Grant, Submission 38; Government of Western Australia, Submission 44; Burdekin Shire Council, Submission 47; Carbonne Council, Submission 51; The Hon Dick Adams MP, Submission 52; South East Local Government Association Inc, Submission 54; Aramac Shire Council, Submission 54.

193　Mid Murray Council, Submission 30.

194　Country Women's Association of NSW, Submission 37

195　Sub Committee of Nambucca shire's Economic and Development Committee, Attachment to Submission 66, p 2

196　Ms Lorraine Boyd, Submission 7.

197　Warren-Blackwood Economic Alliance, Submission 144, p 7.

2.177 The Committee accepts advice that mobile phone coverage is continuing to expand. Many submitters acknowledged that mobile coverage in rural areas had improved, although it is still inadequate in places.[198] Telstra advised the Committee that it was continuing to expand its mobile coverage:

> During the life of this committee we have also significantly expanded the size of our CDMA mobile phone network. Last financial year we added 402 base stations and repeaters. This has increased mobile phone network coverage from 15 per cent of the landmass to almost 19 per cone tot the landmass, with over 98 per cent of the Australian population now covered by Telstra's CDMA mobile network. This financial year we plan to add a further 482 base stations and repeaters. This will increase mobile coverage to well over 20 per cent of the land mass by June 2004.[199]

2.178 Telstra also provided the Committee with information about the cost of providing mobile coverage and the economic viability of expanding coverage to smaller communities:

> …. It is not purely the cost of the base station but the back haul transmission capacity back to a base station controller, which is generally located in the capital cities. So, in the Queensland context, it is in Brisbane. That is a variable cost of course, depending on the distance and the availability of transmission capacity out there. In a general sense, though, if I can generalise, an economically viable solution runs out at a community of about 1,000 people.[200]

2.179 Telstra went on to outline the effect that Government programs have had in enabling coverage to be expanded to smaller communities:

> Since then, of course, we have had the government programs of NTN and Besley that have helped to fund communities that are significantly smaller than that. At the bottom end, we are talking about communities down to about 380 people. Subsequent to that, again there has been some special funding from other organisations such as state governments that has helped us to provide funding for things like gaps in highway coverage et cetera. The last Queensland government's mobile contract included a condition for the provision of mobile phone coverage on some of our highways, and there are other examples of the same thing. The short answer is that, on a straight economic basis, you can look at a community of around 1,000—this is for CDMA, by the way—but through various other programs there should be

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198 Guyra Shire Council, Submission 15, Hay Shire Council, Submission 17, South West Development Commission, Submission 145; South East Local Government Association Inc, Submission 54, eNambucca Project Committee, Submission 66.

199 Mr Bill Scales, Group Managing Director, Regulatory Corporate and Human Relations, Telstra, Committee Hansard, 6 August 2003, p 830.

200 Mr Don Pinel, Regional Managing Director, Telstra Country Wide, Queensland, Committee Hansard, 7 August 2003, p 905.

very few, if any, communities down below 380-odd people where we cannot provide a mobile phone service.[201]

2.180 However, the programs aimed at improving coverage have not been able to assist some communities because of their structure. In its submission the Shire of Nannup, in south western Western Australia, expressed concern about the poor mobile phone service in its area. As part of the Wireless West initiative that involves State, Federal and carrier involvement, two sites in its area were identified for mobile phone towers. Under the program the Council was requested to provide $20,000 per site towards the cost of the infrastructure. As the Council was unable to contribute to the cost, the sites will not be built. The Council expressed concern that local governments were being held to ransom in the site selection process and that the funding of telecommunications infrastructure is not a local government responsibility.[202] Telstra acknowledged that under the Networking the Nation program contributions from local communities were required:

> Under the Networking the Nation program, there was a requirement for whoever was making the application to NTN—and it was not always a council; it could have been another community group—to contribute $10,000. That is in the context of a base station that might cost in total half a million bucks or thereabouts. So, yes, there was a requirement under that program for that contribution to be made.[203]

2.181 Some submissions also noted that while the total extent of mobile coverage was increasing, the important issue for users was the coverage of the network to which they could gain access. In its submission the South West Development Commission stated that there was an expectation, especially by international visitors, that GSM mobiles will work throughout the region.[204] This issue was also raised in relation to programs designed to improve coverage on regional highways:

> I find it quite untenable that tenders were requested from Vodafone, Telstra and Optus for Federal Govts $50.5 million program to improve mobile phone coverage on 35 regional highways.
>
> With Telstra virtually the only provider of CDMA service (Optus offers CDMA on Telstra equipment), it would mean that Vodafone and Optus would be tendering for GSM service. As the carriers do not "speak" to each other (inter-carrier roaming) - a subscriber to Optus GSM cannot access service from a Vodafone or Telstra GSM tower and vice versa - it would

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201 Mr Don Pinel, Regional Managing Director, Telstra Country Wide, Queensland, Committee Hansard, 7 August 2003, p.905.

202 Shire of Nannup, Submission 16.

203 Mr Don Pinel, Regional Managing Director, Telstra Country Wide, Queensland, Committee Hansard, 7 August 2003, p.906.

204 South West Development Commission, Submission 145, p 3.

mean that anyone wanting continual coverage would need to carry CDMA, and three GSM phones to access all carriers.

Inter–carrier roaming is technologically feasible within CDMA and within GSM networks but is not possible between CDMA and GSM networks as the different technologies cannot interact.[205]

2.182 The South West Development Commission suggested that one solution to this problem would be the development of a dual use handset.[206]

2.183 While most of the evidence received by the Committee on mobile phone coverage related to the extent of coverage in rural areas some submissions also raised the issue of blind spots in mobile coverage in both city and country areas:[207]

Arriving in Brisbane, I expected almost a perfect mobile phone system …. Alas, I can't use either of 2 mobile phones in my Unit, or outside in the yard.[208]

2.184 In response to the concerns about continuing non-coverage of more remote areas by its GSM and CDMA networks, representatives of Telstra noted the availability of its satellite service:

We still have TMS, our mobile satellite service, that covers the whole of the footprint of the country. So you can take that as an overlay network that fills in those gaps. It is not as if there is no service there; it is just a different platform that we use.[209]

205   Carol Richard, Submission 46, p 3.

206   South West Development Commission, Submission 145, p 3.

207   Macedon Ranges Shire Council, Submission 33.

208   Mr Richard Millburn, Submission 2.

209   Mr Don Pinel, Regional Managing Director, Telstra Country Wide, Queensland, Committee Hansard, 7 August 2003, p 908.