Chapter 1

An overview of telecommunications in Australia

1.1 The Australian telecommunications network is a dynamic entity and one which is undergoing constant development in response to growing community demand and technological change. Indeed, in the course of its inquiry the Committee's attention was drawn to an almost constant change scenario, both positive and negative,[1] which has hindered the task of its description in other than relatively general terms. Any statistics cited as to the size of the network, traffic volumes by differing technology, market shares, etc would become quickly dated.

1.2 Thus, before seeking to give an overview of the network itself, the Committee believes that it is helpful to an understanding of the present situation by setting the current structure of the telecommunications industry into its historical context. Appendix 5 provides a brief description of the regulatory system, an understanding of which is important to the discussion of many of the issues addressed in this report.

Key developments[2]

1.3 Telecommunications policy in Australia has been driven by the need to provide services to a population concentrated largely in cities separated by long distances, and linking the major cities with high capacity trunk services, while also seeking to reach remote areas with basic services. A fundamental policy tenet has been that basic telecommunications services are reasonably accessible to all people in Australia on an equitable basis.

Early history: 1901-1988

1.4 The Commonwealth Government assumed responsibility for postal, telegraphic and telephonic services in Australia upon Federation in 1901.[3] Until the introduction of limited competition in 1991, telecommunications services were operated and regulated by various publicly-owned monopoly organisations such as the Postmaster General's Department (PMG). The Overseas Telecommunications Commission (OTC) was established in 1946 with responsibility for all international telecommunications services.

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1 While investment in new technology is almost constant, IP1 Australia Pty Ltd, operator of a long-haul fibre optic broadband network between Melbourne, Adelaide and Perth was placed into receivership, and subsequently purchased by Telstra during the Committee's inquiry.

2 The material in this section of the report on the history of telecommunications regulation in Australia is largely drawn from: Department of Communications, Information Technology and Arts, *Liberalisation of the telecommunications sector – Australia's experience*.

3 Under section 51(v) of the *Constitution.*

1.5 The PMG continued to provide all domestic telecommunications services until 1975 when its telecommunications functions were moved to the newly created and subsequently corporatised Telecom Australia. Telecom became the monopoly telecommunications carrier of domestic services within Australia. As well as being the network provider, Telecom was also the technical regulator in customer equipment, private networks and value-added services.

1.6 In 1981 the Government formed AUSSAT. It was a publicly-owned carrier established to own and operate a domestic satellite system. AUSSAT started commercial operations in 1985 when the first satellite was launched.

Separation of policy, regulatory and operational roles

1.7 In May 1988 the Government announced directions for restructuring of the telecommunications industry's regulatory environment and the operations of the Government-owned carrier. The stated goals stressed the need for an efficient and responsive telecommunications industry capable of successful commercial operation in Australia and overseas, while continuing to serve important social objectives with basic telephone services. The reforms were implemented in the *Telecommunications Act 1989* and related legislation.

1.8 As part of the major reforms the basic monopolies of Telecom, OTC and AUSSAT were retained but competition was introduced in the supply of:

- value-added network services;
- customer premises cabling; and
- supply, installation and maintenance of customer premises equipment.

1.9 The operational and regulatory functions of Telecom were also separated. The Australian Telecommunications Authority (AUSTEL) was established in July 1989 as an independent industry-specific regulator with responsibility for technical regulation, protecting the carriers' exclusive rights, protecting competitors from unfair carrier practices, protecting consumers' interests, administering price control and universal service levy arrangements, and promoting carrier efficiency.

1.10 AUSTEL introduced a form of 'light-touch' pricing regulation based on limiting prices to rises in the consumer price index minus a figure to allow for efficiency improvements (CPI-X). Within that framework there were individual sub-caps on some prices.

International reform of telecommunications

1.11 The reforms which were occurring in Australia were part of an international trend towards microeconomic reform of essential service industries such as telecommunications. During the 1980's and 90's there was a broader recognition by governments of the need to transform Australia into a dynamic and outward-looking economy. Governments which had been heavily involved in the supply of essential

services for businesses and households sought to promote greater efficiency in the provision of those services by opening them to competition.

1.12 Internationally, the importance attributed to telecommunications as a traded service in its own right, as well as a backbone for commercial development and trade in all other economic sectors, was being recognised in international trade negotiations such as the Uruguay Round of the General Agreement on Trade in Services. In September 1996 the APEC Telecommunications Ministers endorsed the Reference List of Elements of a Fully Liberalised Telecommunications Services Sector. The Reference List provided a broad perspective on the expectations of a liberalised telecommunications sector and catalogued the key features of a liberalised market largely from the point of view of users and other market participants. Also in 1996 the European Commission adopted a Directive which called for the introduction of competition in the provision of voice telephony and infrastructure by 1 January 1998. The harmonisation framework aimed at creating a European market based on common principles for access to networks and services, a common regulatory environment and harmonised standards for services and technologies.

The telecommunications carrier duopoly: 1990-1997

1.13 The Commonwealth Government announced further reforms of the structure and ownership of telecommunications networks in 1990. A phased approach was adopted to move from monopoly provider to open competition in basic services. As part of the reform arrangements a second carrier would be given sufficient time, and a relatively stable and predictable environment, within which to establish itself in the marketplace before the advent of full competition from 1 July 1997.

1.14 The strategy was implemented in 1991 and 1992, largely as a function of the *Telecommunications Act 1991*. Key components of the strategy included:

- merging Telecom and OTC to become Telstra Corporation;
- allowing Optus to take over AUSSAT and operate as a facilities-based network competitor;
- this facilities-based duopoly was to end in 1997, leading to open competition;
- licensing three public mobile telecommunications service operators (Telstra, Optus and Vodafone);
- mandating open competition in the areas of:
    - resale of domestic and international telecommunications capacity and
    - public access cordless telecommunications services; and
- giving AUSTEL a stronger mandate to promote competition and to protect the interests of consumers, through setting and monitoring carrier service

quality indicators, monitoring and reporting on price controls, and enforcing carrier licence conditions that included specific consumer safeguards and the universal service obligation.

1.15 The universal service obligation (USO) represented a cornerstone of the telecommunications framework.[4] However, with the introduction of network competition, the Commonwealth Government considered it was not feasible for one carrier to both provide and fund social obligations. The carrier fulfilling the USO would therefore be compensated by other participating carriers for any USO losses that were approved by AUSTEL. Telstra was declared the sole USO carrier throughout Australia.

1.16 The Spectrum Management Agency (SMA) was created in 1993 to manage the radiofrequency spectrum, taking over this role from the Commonwealth Department of Transport and Communications, and subsequently merged with AUSTEL to form an agency regulating both telecommunications and the radiofrequency spectrum. This was arguably the first implicit recognition of the process of convergence, which continues apace today.

Telstra partial privatisation

1.17 The Commonwealth Government moved to implement the partial privatisation of Telstra in May 1996 by selling one third of its equity in the company by means of a share float. This partial privatisation, which proceeded in late 1997, removed some previous constraints on Telstra's structural and operational capacity and provided a stimulus to Telstra's ability to raise capital for network expansion and modernisation and to keep pace with changing technologies.

Open competition: 1 July 1997

1.18 A new era of open competition began when the *Telecommunications Act 1997* and related legislation came into force in July 1997. The stated policy objective of the legislative reform package was to provide a regulatory framework that promoted the long-term interests of end-users of telecommunications services, and the efficiency and international competitiveness of the Australian telecommunications industry.

1.19 The pro-competitive reforms allowed new entrants to the market to build and operate telecommunications infrastructure. Past regulatory barriers to market entry, as well as a number of artificial regulatory distinctions, such as between mobile and fixed carrier licences, were removed. No restrictions were imposed on entry to any telecommunications service market and restrictions on the types of technology used were minimised.

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4 Part 13 of the *Telecommunications Act 1991* provided for the assessment, collection, recovery and distribution of the universal service levy imposed by the *Telecommunications (Universal Service Levy) Act 1991* to cover the costs of providing the universal service obligation.

1.20 The reforms also introduced an access regime under which the then Trade Practices Commission (now the Australian Competition and Consumer Commission (ACCC)) could 'declare' certain services under Part XIC of the *Trade Practices Act 1994*. Once these services were declared the company or companies providing those services were obliged to provide access to those services to other carriers or carriage service providers. If the terms and conditions of access could not be successfully negotiated between the parties the ACCC could intervene and arbitrate on the dispute.

Further privatisation of Telstra

1.21 While the Prime Minister, John Howard, announced as early as March 1998 the Government's intention to sell the two-thirds share of Telstra which was still government-owned, prior to the October 1998 federal election the Government committed to a staged approach to any further privatisation. It announced that it would first sell a further 16 per cent of its equity in Telstra, with a commitment that there would be no further sell down of the Government's remaining share until an independent inquiry certified that Telstra's services were adequate.[5]

1.22 In June 1999, legislation was passed authorising the sale of a further 16.6 per cent of Telstra. The majority of the revenue from the sale was allocated to reduce Commonwealth Government debt. Funds were also made available to upgrade services in rural and regional Australia. The Government has signalled its intention to sell the remaining 50.1 per cent of its equity, but its plans have been rejected by the Senate.[6]

Ongoing review

1.23 Since the introduction of the *Telecommunications Act 1997* a number of amendments have been made to the regulatory framework to seek to enhance its effectiveness. In the main, the amendments respond to industry concerns about the ability of the ACCC to respond to issues in a timely manner and the ability of Telstra to take advantage of its residual market power.

1.24 The powers of the ACCC have been broadened and strengthened in a number of areas including, for example, the power to impose record-keeping rules on the telecommunications industry; to enable the ACCC to report and publicly release competition related data; to issue competition notices; and, in relation to enhancing the access arbitration process, the ACCC's roles in attending, mediating and arbitrating access negotiations.

1.25 The *Telecommunications Competition Act 2002* in particular was designed to facilitate increased competition and investment in the telecommunications industry

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5 See Appendix 6 for details of this and related inquiries.

6 Most recently, the Telstra (Transition to Full Private Ownership) Bill 2003 [No. 2] was negatived at the second reading stage by the Senate on 30 March 2004.

and to provide a more transparent regulatory market, particularly in relation to Telstra's wholesale and retail operations.

1.26 Appendix 6 outlines some more recent inquiries which have been conducted into telecommunications in Australia. The main inquiries have been the Telecommunications Service Inquiry and the Regional Telecommunications Inquiry which have both looked at the adequacy of telecommunications services. The Government has acted on the recommendations of those inquiries by introducing a range of measures aimed at addressing individual issues identified by those inquiries. However, its response has consisted of a raft of narrowly focused short term programs which have neither set out a long term vision for telecommunications in Australia nor provided the leadership necessary to take the industry forward.

Regulation of telecommunications infrastructure

Carriers and service providers

1.27 The main entities regulated by the *Telecommunications Act 1997* are carriers, carriage service providers and content service providers.

1.28 Carriers own or operate telecommunications infrastructure. They must be individually licensed by the Australian Communications Authority. A carrier licence authorises the owner of network units to supply telecommunications services to the public. Licence conditions oblige carriers to meet a number of specified requirements including USO contributions, payment of annual licence fees, fulfilment of industry development plans and compliance with the telecommunications access regime. There is no limit to the number of carrier licences that may be issued by the ACA.

1.29 Service providers sell services to the public which are provided using their own, or another carrier's, infrastructure. They are not subject to licensing requirements, but are required to comply with legislated service provider rules and other provisions of the Act, such as operator and directory assistance services, itemised billing and number database information.

1.30 The new open and competitive telecommunications environment in Australia is characterised by increasing numbers of private sector participants (including foreign communications companies and new players such as utility companies). As at 30 June 2004, there were some 105 carriers licensed by the ACA and over 1400 carriage service providers were registered with the Telecommunications Industry Ombudsman. In Australia there were an estimated 11.58 million standard fixed telephone lines and 14.3 million mobile phone subscribers.

Fixed line customer networks

1.31 The Public Switched Telephone Network (PSTN) referred to specifically in the Committee's terms of reference is essentially the Telstra national fixed network delivering basic telephone services. It has been described as 'the part of the telecommunications network which enables any customer to establish a connection for

voice communication with any other customer either automatically or with operator assistance'.[7]

1.32 The 'backbone network' is the trunk or interexchange network. The fixed line customer access network (CAN), also referred to as the 'local loop', connects the customer's home telephone to a local area switch. It is mainly comprised of copper cable but may use wireless or satellite technologies. It enables access to voice, dial up Internet and broadband services. A number of companies provide fixed line services for businesses in the capital city CBD's.

1.33 Hybrid Fibre Coaxial (HFC) networks have been rolled out by both Telstra and Optus in parts of some capital cities. These networks carry signals on optic fibre cables to nodes which then broadcast the signals for a large number of customers on a common coaxial cable. Individual subscribers are connected to the common cable and tune into that part of the signal that is of interest to them. HFC networks were originally developed to provide pay TV services but can be also be used to provide voice telephony and broadband access to the Internet. Telstra offers pay TV and broadband services over its HFC cable while Optus also offers voice telephony. Telstra is currently in the process of digitising it HFC network. This will make it possible to offer a larger number of pay TV channels over the cable.

1.34 The Telstra and Optus HFC networks largely duplicate each other in area of coverage. Neighborhood Cable Pty Ltd has rolled out an HFC network in regional Victoria and smaller networks exist in Darwin and some other places.

1.35 In Canberra, TransAct Communications is in the process of rolling out a high speed network which delivers telephony, free-to-air and pay TV, and Internet services. The TransAct network is based on a fibre-to-the-curb (FTTC) architecture in which high capacity optic fibres are taken 'deep' into the network (within 300 metres of the connection to the home). The last segment of the connection to the user consists of a dedicated pair of copper wires. The short length and high quality of the copper link allow high capacity data to be carried over the network. The network supports voice telephony, dial-up Internet, pay TV, broadband and video on demand. In Perth, Bright Communications has started building a network with similar capability.

1.36 Both TransAct and Bright have local power utilities as key founding shareholders. This gives them access to existing power poles to run their cables and allows telecommunications ducts to be laid in conjunction with underground power ducts.

Mobile networks

1.37 Telstra claims that its terrestrial mobile networks can reach about 98 per cent of the country's population and, with the use of a car external antenna kit, have coverage

7 Telecommunications Service Inquiry, *Connecting Australia*, p 248.

of close to 20 per cent of the land area.[8] The company has an ongoing base station installation program which will boost these numbers.[9]

1.38 The auctions in 1988 and 2000 of radiocommunications spectrum in the 800 MHz and 1.8 GHz bands (used primarily for mobile telephony technologies) has facilitated the entry into the market of several new mobile phone carriers. Telstra operates both a GSM (Global System for Mobile Communications) and a CDMA (Code Division Multiple Access) network while Optus and Vodafone are operating only GSM networks. GSM and CDMA are mobile telephone systems based on digital transmission with, in Telstra's case, its CDMA network having twice the geographic reach of its GSM network. These 2nd generation (2G) networks provide voice services and data messaging.

1.39 Although competition is stronger in the mobile sector than in the fixed line network, Telstra remains the dominant carrier with some 45 per cent of market share. Optus has 34 per cent and Vodafone 17 per cent. Virgin Mobile Australia is now operating profitably and is seeking to grow its subscriber base.

1.40 At a cost of some $3 billion, Hutchison Telecommunications has launched a 3rd generation (3G) network, a high capacity digital mobile phone system. The number of subscribers is growing but only passed 100,000 in early 2004. It offers services such as voice, Internet and real time video. Vodafone is reported to be seeking to establish a globally compatible 3G network, including an investment in Australia of hundreds of millions of dollars.

1.41 Several witnesses to the Committee's inquiry noted that mobile phone connections could often not be obtained within the areas claimed by carriers to be served, and were critical of the carriers as a result. It must be noted that there will be areas inside the claimed coverage zone of any cellular system where a mobile phone may not work due to a variety of factors. For example, reception may be degraded or non-existent in certain places, such as basements, lifts, underground car parks and large concrete buildings. Reception can also be affected by mountains, tunnels and road cuttings. The Committee was told that Telstra MobileNet is endeavouring to provide the best depth of reception practicable in such areas and it assumes that all carriers have similar ambitions.

Satellite

1.42 Optus owns and operates all of Australia's satellites. Some satellite services are provided by use of foreign satellites with coverage over parts of Australia. However,

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8 Telstra provided the Committee with maps showing the extent of coverage of its CDMA and GSM networks. Unfortunately, their use of colour coding meant that they could not be reproduced in this report. It follows from the text that coverage is based on population centres, with no service provided to some 80 per cent of the country.

9 Mr Bill Scales, Group Managing Director, Regulatory, Telstra, Official Committee Hansard, 6 August 2003, p. 830.

space on the Optus satellites is leased by other service providers such as Foxtel and Telstra, with Telstra offering a satellite mobile network which covers 100% of Australia. Satellites are used to provide pay TV broadcasts, broadband access, mobile phone access and some fixed telephony services.

1.43 In July 2001 the Government finalised a contract with Telstra to improve services for consumers in the extended zones using $150 million from the proceeds of the second partial sale of Telstra. Under this agreement all extended zone customers of Telstra gained access to untimed local calls and became eligible for free installation of a subsidised two-way satellite Internet service.

Wireless

1.44 In addition to mobile services a variety of wireless technologies can be used to provide voice, dial up Internet and broadband services. However, to date these technologies have most often been used to fill holes in the coverage of fixed line networks. Wireless networks have not yet become a significant rival to other network architectures although the use of wireless technology is becoming more common.

The Committee's inquiry into the Australian telecommunications network

1.45 The Australian telecommunications network is the aggregation of all of the above infrastructure components – consisting of a wide array of wired and wireless delivery systems. It begs straightforward description simply because, in any one location, there might be an unique mix of delivery systems operational and which are ever-changing due to technological or competitive developments. Resolution of an infrastructure problem is almost a matter for case-by-case determination.

1.46 The Committee's terms of reference essentially require it to assess the ability of the network to provide adequate services to all Australians, particularly (but not exclusively) in rural and regional areas, and to assess what more might need to be done to ensure that adequate services are available. The terms of reference also place an emphasis on the public switched telephone network, Australia's longstanding source of communications services, and significant for the traditional market power it has given Telstra for its 'last mile' connectivity to all premises.

1.47 Telstra is by far the largest participant in the Australian telecommunications market. With some 65 per cent overall market share, it continues to dominate the key sectors of the network, including the provision of infrastructure and the public switched telephone network, and is the Universal Service Provider. Although there are a number of other participants who now operate significant networks in competition with Telstra they usually offer only one type of service or offer services only in specific geographic areas. There are also a significant number of service providers who re-sell Telstra services to the public.

1.48 Both of these groups rely to a greater or lesser extent on the use of some of Telstra's network and Telstra earns significant revenue from providing its competitors with wholesale services. For these reasons much of the discussion during the inquiry

and in this report has focused on the role of Telstra and the performance of its network.

1.49 While the Committee has given an overview above of infrastructure based on wired and wireless delivery platforms the view of most industry participants is that the future of the network lies principally in fixed line optical fibre networks, supplemented by wireless technologies for mobile applications and to fill niches in the fixed line network. The current copper based CAN is unlikely to be able to meet the future needs of consumers and clearly has a limited life. Its performance is also limited by the use of outdated technology in the network such as pair gain systems. The question facing policy makers is what policy steps need to be taken to ensure that the existing network is operating at an optimal standard, and to provide leadership in developing a network which will take Australia forward during the new century. Although this report contains some recommendations on the future of the network the issue of network renewal will be addressed in more detail in the Committee's report on broadband competition.

1.50 In the chapters that follow the Committee has found it most convenient to address its terms of reference by examining the network’s capacity to deliver services; the current impediments to the delivery of services; Government programs aimed at improving access; competition and regulatory issues; and the future of the telecommunications network.