



Australian
Mobile Telecommunications
Association

The Allen Consulting Group

Australian Mobile Telecommunications Industry

Economic Significance

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Report to the Australian Mobile Telecommunications Association

The Allen Consulting Group

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Acknowledgments

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A working group of ten industry representatives (listed in appendix A) provided guidance and feedback on the project. This included providing guidance on industry issues and supplying information on various aspects of the industry. The working group was established and run by the Australian Mobile Telecommunications Association (AMTA).

In addition, the report includes information that individual mobile telecommunications businesses provided. Industry participation in the information gathering process enabled the report to include a range of views on current industry issues.

Preface

This report was commissioned by the Australian Mobile Telecommunications Association (AMTA) and completed by The Allen Consulting Group. This is the third year that AMTA has commissioned a report on the economic significance of the mobile telecommunications industry.

AMTA is the peak industry body representing Australia's mobile telecommunications industry. Its mission is 'to promote an environmentally, socially and economically responsible and successful mobile telecommunications industry in Australia'.

AMTA's members include the mobile phone carriers, handset manufacturers, retail outlets, network equipment suppliers and other suppliers to the industry.

The Allen Consulting Group is a strategic consulting firm specialising in policy, program, regulatory and stakeholder analysis. We assist governments and organisations in designing more effective reforms, programs, regulatory frameworks and organisational arrangements. We have experience in advising across telecommunications, health and community services, education, employment and training, housing, utilities, transport, finance, services and manufacturing sectors.

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Executive summary

Australia's mobile telecommunications industry has been a strong performer over the last ten years, and its ongoing innovation provides a platform for continued success. In 2004-05, the Australian mobile telecommunications industry had more than 16 million subscribers, representing approximately 81 per cent of the Australian population. This mobile penetration rate is forecasted to exceed 94 per cent in 2005-06. Mobile telecommunications have clearly become a part of everyday life for individuals, business and the community.

To better understand the economic significance of the mobile telecommunications industry in Australia, the Australian Mobile Telecommunications Association (AMTA) engaged The Allen Consulting Group to undertake research in this area. This report brings together detailed information on the participants in the industry and the industry's growth, and presents examples of how mobile phones have enhanced the way people do business and manage their daily lives. It also presents measures of the economic significance of mobile telecommunications to the telecommunications industry and the economy at large.

The mobile telecommunications industry

The mobile telecommunications industry is made up of three major sectors, plus an additional three small sectors that are growing in importance.

The *hardware sector* is responsible for building and maintaining the network infrastructure required for mobile telephony, as well as providing end-user hardware such as handsets. The hardware sector includes several large global firms and many smaller firms, most of which provide end-user equipment.

Carriage service providers (CSPs) supply telecommunication services to the public using carrier network infrastructure. There are currently twenty-seven CSPs operating in Australia. This includes four mobile network carriers — Telstra, Optus, Vodafone and Hutchison — who own and operate six mobile networks, in addition to a number of resellers and mobile virtual network operators (MVNOs). The CSP sector is the largest individual sector in the mobile telecommunications industry.

Retailers are the third major sector of the mobile telecommunications industry. They offer mobile services to end users on behalf of the CSPs. Customers can purchase mobile telecommunications hardware and services from different kinds of retail outlets, including speciality shops that are branded by a CSP and outlets that sell mobile telecommunications as part of a broad range of products. A recent development in the retailing of mobile telecommunications is the facility for customers to purchase mobile phones and connect to services online.

The relatively new sectors of *content providers*, *content aggregators* and *program developers* are growing in importance. Content providers develop and provide information and entertainment on mobile phones. Content aggregators typically manage multiple content providers and supply services such as sourcing, reporting, formatting for multiple streams, quality control and cross referencing. Program developers design new applications that can create further market opportunity for content providers and aggregators, as well as other program developers.

Economic significance of mobile telecommunications

The mobile telecommunications industry is a high-revenue, high-cost industry that makes a substantial and growing contribution to the wider telecommunications industry and the Australian economy. The following indicators demonstrate this.

- *Industry gross product for the CSP sector in 2004-05 was \$6.1 billion, up from \$5.3 billion in the previous year.¹*
 - Industry gross product (IGP) is a measure of the economic contribution of a specific industry to the economy or value added.
 - The current contribution of the mobile telecommunications sector to the economy is larger than the free to air television services industry and also larger than the newspaper printing and publishing industry. Furthermore, it is almost three times the contribution of the automotive, vehicle and component manufacturing sector.
- *The industry contributes substantially to government revenues through industry-specific charges and levies, as well as standard Commonwealth and state industry taxes.*
 - It is estimated that ongoing industry-specific payments made by the mobile telecommunications industry to government are in the order of two per cent of revenue per year, or \$175.6 million in 2004-05.
 - The industry contributes to its effective operation through compulsory and voluntary payments to support various industry associations and self-regulatory schemes, for example the National Relay Service, AMTA and the Telecommunications Industry Ombudsman.
- *Employment in the mobile telecommunications industry is growing.*
 - Approximately 33 600 people worked in the industry (on a full-time, part-time or casual basis) in 2004-05. Over the period 1999-00 to 2004-05, employment in the mobile telecommunications industry increased by 46 per cent, compared to an increase of roughly 38 per cent in the telecommunications industry as a whole.
 - In 2004-05, the mobile telecommunications industry paid around \$1.3 billion in wages.
 - Mobile telecommunications accounted for 30 per cent of total telecommunications employment in 2004-05. By comparison, it accounted for 27 per cent in 1998-99.

¹ This figure is based on statistics on mobile network carriers IGP from IBISWorld publication J7122 *Mobile Telecommunications Carriers in Australia 2004*, and statistics on mobile resellers IGP from IBISWorld publication J7123 *Telecommunications Resellers in Australia 2004*.

- *Capital expenditure by the industry has been substantial.*
 - In 2005, the industry has continued its capital expenditures to support new networks and expansions and upgrades to existing networks. This is in addition to regular operating expenditures.
 - Capital expenditure on new networks since 1997 is estimated at \$10 billion.² These investments underpin expansions to mobile network coverage that make mobile services available to more people in more places, as well as support the development of innovative services.
- *Revenue in the mobile telecommunications industry is significant.*
 - Mobile telecommunications industry revenue for 2004-05 was \$9.9 billion, and estimates suggest that it will be \$11.9 billion in 2005-06.³
 - In 2004-05, mobile revenue represented 30 per cent of total telecommunications revenue.

Expectations of continuing industry development

The measures of economic significance of the mobile telecommunications industry underscore the strong growth that the industry has experienced in its first ten years. Moreover, they make clear that the industry has evolved substantially over this time. The emerging trends suggest that industry development continues to be driven by competition, innovation and a focus on meeting customer needs.

Subscriber numbers have shown strong growth since the early 1990s. The estimated annual growth rate in mobile subscriber numbers from 2004-05 to 2005-06 was 13.4 per cent. Peaks in subscriber growth appear to be associated with the introduction of new networks, and the full impact on growth rates of the new 3G network, which commenced in 2003, will be observed over the coming years.

Mobile penetration rate is the number of mobile phone services per 100 people. Australia's mobile penetration rate grew from 58 per cent in 2001-02 to 81 per cent in 2004-05, and it is forecasted to exceed 94 per cent in 2005-06.⁴ Although it may seem surprising, a penetration rate exceeding 100 per cent has been achieved in a number of countries and research suggests that it will be achieved in Australia by the end of 2008.⁵

Prepaid customers are driving the continued growth in subscriber numbers (see figure ES.1). In 2004-05, 43 per cent of all mobile phone services were prepaid. This group of services is expected to grow to 47 per cent of all mobile services in 2005-06. Prepaid services offer an inexpensive way to enter the mobile market, allowing customers to better manage their mobile phone expenditure. The increasing preference for prepaid services suggests that customers value choice and flexibility.

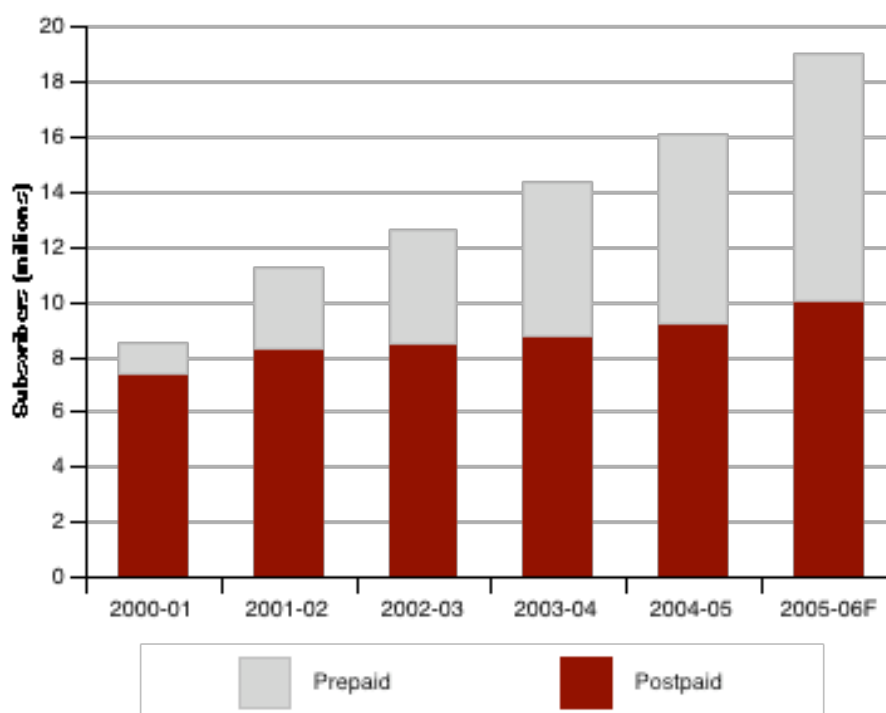
² IBISWorld 2005, *J7122 – Mobile Telecommunications Carriers in Australia*, p. 20..

³ Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

⁴ Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

⁵ Computer World 2005, *Australia's Mobile Phone Use to Exceed 100% in 3 Years*.

Figure ES.1

PREPAID VERSUS POST-PAID SUBSCRIBERS, 2000-01 TO 2005-06

Note: F indicates forecast values.

Source: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

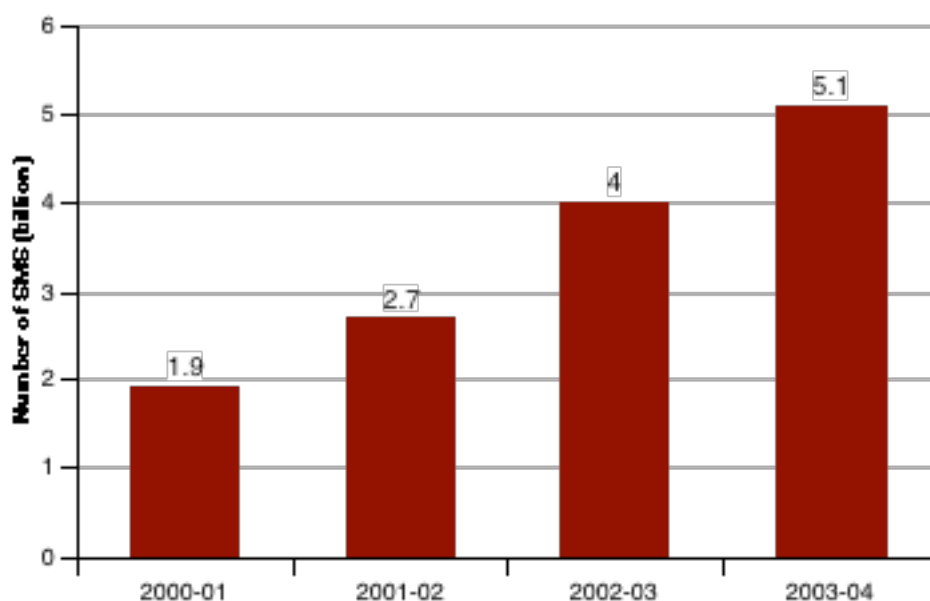
Short message service (SMS) is another major source of growth in the mobile telecommunications industry. During 2003-04, almost 5.1 billion SMS messages were sent, reflecting an increase of 28 per cent from the previous year (see figure ES.2).⁶ Huge peaks in SMS use are experienced at significant times in the community, such as Christmas, New Year's Day and Valentine's Day. Furthermore, many industry innovations are being developed around the use of SMS.

The use of *multimedia message service* (MMS) is increasing in the mobile telecommunications market, with 13.7 million MMS messages sent in 2003-04.⁷

⁶ Australian Communications Authority, 2005, *Telecommunications Performance Report 2003-04*, Melbourne, p. 76.

⁷ Ibid., p. 77.

Figure ES.2

BILLIONS OF SHORT MESSAGE SERVICES (SMS), 2000-01 TO 2003-04

Source: Australian Communications Authority 2005, *Telecommunications Performance Report 2003-04*, Melbourne, p. 76.

Innovation: the benefits of convergence

The rapid speed in which the mobile telecommunications industry moved from the now obsolete AMPS network to the most recent third generation of mobile phones illustrates the industry's penchant for embracing innovation. In the past few years, the industry has made significant advances in linking mobile phones to other forms of technology, particularly media and information technologies.

Known as convergence, this process blends communications technologies together to facilitate wider, more integrated methods for the distribution of information. Convergence has transformed the mobile phone from a basic voice communication piece to a machine facilitating the interaction of three major sectors: telecommunications, media and information technology.⁸

A key aspect of convergence is that it enables users to access a wide variety of content on their mobile phones. For example, some mobile phones now allow users to:

- have immediate access to news highlights, sport, stock prices, listen to music and news on the radio and watch television broadcasts (media);
- send and receive emails, including synchronisation with business software (information technology); and
- hold video conference calls, send SMS to fixed phone lines and take digital quality photos (telecommunications).

Innovations of this type are impacting the way individuals go about their day-to-day activities and the way businesses operate, both helping to improve the quality of life and increase productivity.

⁸ M/Cyclopedia of New Media 2004, *Mobile Phones-Convergence*, <http://wiki.media-culture.org.au>, accessed 13 July 2005.

Convergence also presents challenges for the industry and its regulators in ensuring that the new models of service delivery meet high standards for responsibility and accountability.

Social contribution

Data on measures such as IGP, employment and payments to government demonstrate the economic contribution of the mobile telecommunications industry to the Australian economy. However, those measures do not capture the many ways in which mobile telephony contributes to improvements in the quality of people's lives and increases in social equity more broadly.

For many people, mobile telecommunications is more than a tool to make voice calls; instead, the extensive coverage, array of services and information available mean that the mobile phone can 'make life mobile'. A significant benefit of mobile telecommunications continues to be the accessibility and freedom for people on the move to maintain contact with other people.

Innovations in the mobile telecommunications industry also have helped to increase social equity by expanding access to disadvantaged groups, encouraging workforce participation and using revenues for community programs. For example, the increased affordability of mobile telephony — particularly through low-cost and capped plans — allows more people to benefit from the connectivity of mobile telecommunications services.

The mobile telecommunications industry also has been a leader in promoting the appropriate disposal of mobile telecommunications products in order to protect the environment. Since 1999, its fully funded recycling program has collected more than 300 tonnes of mobile phone handsets, batteries and accessories for recycling.

Future reports

This is the third report sponsored by AMTA to examine the economic significance of the mobile telecommunications industry. AMTA welcomes comments on the methodology used and the material presented in the report.

Glossary

ABA	Australian Broadcasting Authority
ABS	Australian Bureau of Statistics
ACA	Australian Communications Authority
ACMA	Australian Communications and Media Authority
ACCC	Australian Competition and Consumer Commission
ACLC	Annual Carrier Licence Charge
AMPS	Analogue Mobile Phone Service
AMTA	Australian Mobile Telecommunications Association
ARPU	Average Revenue Per User
CDMA	Code Division Multiple Access
CSP	Carriage Service Provider
DCITA	Department of Communications, Information Technology and the Arts
GDP	Gross Domestic Product
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
IGP	Industry Gross Product
IVM	Interactive Voice Messaging
IVR	Interactive Voice Response
LAN	Local Area Network
MCF	Mobile Carriers Forum
MMS	Multimedia Message Service
MPIRP	Mobile Phone Industry Recycling Program
OECD	Organisation for Economic Co-operation and Development
SMS	Short Message Service
TDMA	Time Division Multiple Access
USO	Universal Service Obligation
VAS	Value Added Services
MVNO	Mobile Virtual Network Operator
WAP	Wireless Application Protocol
WASP	Wireless Application Service Providers
WCDMA	Wideband Code Division Multiple Access
WHO	World Health Organisation
2G	Second Generation Technology
3G	Third Generation Technology

Chapter 1

Introduction

1.1 The project

The Australian mobile telecommunications industry is now more than one decade old, and in that time, it has formed a major part of everyday life in our society. The industry experienced major growth in the mid 1990s as a market in its infancy, but has continued to grow in recent times through innovative products and services of benefit to individuals and the wider community.

The Australian Mobile Telecommunications Association (AMTA) engaged The Allen Consulting Group to undertake research and prepare this report on the economic significance and contribution of the Australian mobile telecommunications industry. This is the third year the report has been produced.

This year's report brings together a broad range of information available from many public sources, and builds on it by synthesising unique data collected from an AMTA member survey.

The report measures the economic significance of the mobile telecommunications industry to the Australian economy by:

- detailing information on the industry participants and industry growth; and
- highlighting the continuous innovation in products and services that has driven recent industry growth.

The report is a valuable tool for the industry in promoting an increased level of awareness of the economic and social importance of Australia's mobile telecommunications industry and the factors likely to shape its future.

1.2 The project approach

The project was conducted from May to September 2005. It involved:

- desktop research to gather relevant national and international information on the mobile telecommunications industry;
- a survey of AMTA member firms in various sectors of the mobile telecommunications industry;
- the collection of data from a working group of selected AMTA members; and
- collation, analysis and presentation of the three types of data.

AMTA and The Allen Consulting Group would welcome comments on the methodology used and the material presented in the report.

Chapter 2

Snapshot of Australia's mobile telecommunications industry

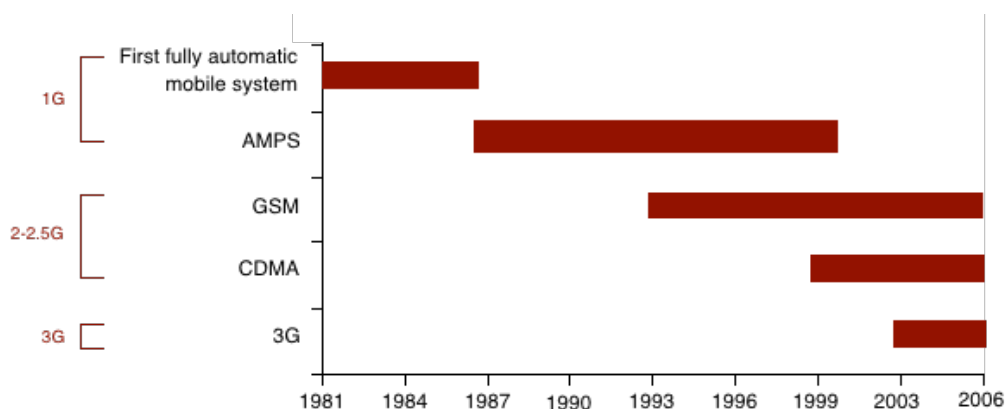
2.1 A short history

Australia's first mobile phone system commenced operation in Melbourne in August 1981. Although this service was fully automatic, it was a long way from the mobile services received and used today. Figure 2.1 shows the development of various mobile telecommunications networks in Australia since 1981.

Box 2.1 provides a description of the various network technologies.

Figure 2.1

MOBILE TELECOMMUNICATIONS TIMELINE, 1981 TO 2006



In 1987 when the first analogue, or Analogue Mobile Phone Service (AMPS), cellular network was launched, hand-held phones could be purchased. These phones were big and bulky and sold for over \$4000 at the time. Industry development over the next five years included increasing numbers of mobile network operators, growth in customer numbers and improvements in mobile telecommunications hardware. The majority of the analogue network (about 80 per cent) closed on 31 December 2000, including in all major capital cities and many major regional areas. The remaining analogue network was progressively switched off during 2000.

Box 2.1

MOBILE TELECOMMUNICATIONS TERMS/DEFINITIONS**1st Generation Technology**

Advanced Mobile Phone System (AMPS) — a mobile telephone system predominantly based on analogue transmission. The AMPS system in Australia has now been switched off and replaced by Code Division Multiple Access (CDMA).

Analogue Signal — an emission created by converting sound waves or other information into electrical impulses of varying strengths or amplitudes. (See digital signal).

2nd Generation Technology (2G)

Code Division Multiple Access (CDMA) — a digital standard designed for use in cellular mobile networks that assigns a unique code to each user and spreads transmission of user channels across a wide band of radio frequencies. CDMA mobile technology was introduced in Australia in September 1999 to replace the analogue mobile phone system.

Digital Signal — an emission created by conversion of sound waves, radio waves or other information into binary computer code (a series of zeros and ones). It provides sharper, clearer, faster transmission of information and suffers less from noise and interference than analogue signals. It will retain a high quality signal until the signal strength is very low, at which point it will 'drop-out'. The quality of an analogue signal begins declining even at high strength levels but is less likely to dropout completely. (See analogue signal.)

Global System for Mobile communications (GSM) — a European digital standard for mobile phones based on Time Division Multiple Access (TDMA). Telstra, Optus, and Vodafone launched GSM in Australia in 1993.

2.5 Generation Technology (2.5G)

Advancement on the 2G network that allows some technologies in the 3rd generation network to operate in GSM and CDMA environments. General Packet Radio Service (GPRS) networks are included in this generation.

3rd Generation Technology (3G)

Wideband Code Division Multiple Access (WCDMA) — a technology for wideband digital radio communications of internet, multimedia, video and other capacity-demanding applications.

1xRTT — an upgrade to the CDMA network to provide packet data capability. 1xRTT provides burst speeds up to 154 kilobits per second.

EVDO — a further upgrade to the CDMA network. EVDO provides a separate data channel and supports burst data speeds over 1 megabit per second.

In 1993, the new second generation (2G) digital global system for mobile communications (GSM) networks was launched and growth in customer numbers surged (see chapter 3). Telstra, Optus and Vodafone launched GSM services in that year. These networks remain in operation today, and in 2004-05 over 90 per cent of mobile telecommunications services were provided on GSM networks.⁹ These carriers have also implemented General Packet Radio Service (GPRS) networks ('2.5G' networks) that deliver '3G like' multimedia services.

In 1998, plans to introduce a new 2G network based on Code Division Multiple Access (CDMA) technology were introduced. The CDMA network commenced in September 1999 and growth rates in customer numbers increased in 1999 and 2000. Today, Telstra and Hutchison operate CDMA networks, which provide almost 10 per cent of mobile telecommunications services, and Optus resells the Telstra CDMA service.

⁹Credit Suisse First Boston 2005, *Australian Telecommunication 2005*, Equity Research, p. 50.

In 2003, Hutchison launched the first commercially available 3G network under the brand name '3', using the Wideband CDMA standard. The introduction of 3 enabled the first live, person-to-person video calling and high-speed delivery of advanced multimedia services, such as news and sport highlights, live video streaming and other information and entertainment.

Today, 3 is available in the five mainland Australia capitals, as well as Canberra and the Gold Coast. In the two years of operation, Hutchinson has attracted more than 500 000 customers.

Other mobile network carriers are also working on providing 3G networks and services to the Australian market.

- Optus launched its 3G network in Canberra in April 2005, and it is expected that a full rollout of 3G services will be completed by March 2007. Optus also offers '3G like' services via its existing 2.5G network — Optus Zoo, for example, delivers live television streaming and innovative content to over 1 million registered subscribers.
- Vodafone launched a trial of its 3G network in July 2005, with a full launch to be completed by the end of the year. Like Optus, Vodafone currently provides '3G like' services over its 2.5G network, such as Vodafone live!.
- Telstra's 3G network is operational in the five mainland Australia capitals and Canberra, and its handset sales commence 5 September 2005. These 3G services are operated jointly with the Hutchison network. Telstra 3G services enable customers to:
 - leave a video message after seeing a pre-recorded video greeting (with video calling and video MessageBank); and
 - access video ringtones, mobile email services from sites including Yahoo! and Hotmail, and choose from numerous content sites (including 50 Telstra Active and more than 200 specifically designed i-mode sites).

One innovation in 3G technology is the sharing of networks and radio infrastructure by carriers. Agreements to share networks can significantly reduce network costs and enable carriers to roll out faster while delivering efficiencies to both carriers.

Box 2.2 outlines the two major sharing agreements undertaken by mobile network carriers to improve their 3G networks.

Box 2.2

3G NETWORK SHARING AGREEMENTS**Telstra and Hutchison**

On 4 August 2004, Telstra and Hutchison announced the signing of a Heads of Agreement to establish a 50/50 enterprise to jointly own and operate H3GA's existing 3G radio access network and fund future network development. Under the agreement, the H3GA radio access network will become the core asset of the joint enterprise. In return for the 50 per cent ownership of the asset, Telstra will pay Hutchison \$450 million under a fixed payment schedule of four instalments, which began in November 2004.

The joint enterprise is expected to open opportunities for new revenues for Telstra and H3GA, stimulate growth in 3G service uptake and provide significant savings in 3G network construction capital expenditure and operating expenses such as site rental and maintenance.

Hutchison already provides 3G services and Telstra will launch its 3G services to customers in 2005, utilising the entire H3GA network footprint of more than 2000 base stations covering Sydney, Melbourne, Brisbane, Adelaide, Perth, Canberra and the Gold Coast. Telstra and Hutchison expect to significantly increase the size of the network over the next three years, expanding into regional centres. Decisions on network development will be made and funded jointly. The joint enterprise will use the existing spectrum holdings of both partners and will operate until the expiry of those spectrum licences in 2017 or later.

Telstra and Hutchison will each continue to own separate core networks, application and service platforms, and will conduct their retail 3G businesses independently and in competition with each other.

Optus and Vodafone

On 26 August 2004, Optus and Vodafone announced a Heads of Agreement to share 3G network sites and radio infrastructure across Australia. Under the agreement Optus, and Vodafone will work together to build and operate a joint national 3G radio network infrastructure.

Optus and Vodafone have indicated that the agreement is expected to lower the 3G cost structure and provide customers with access to a robust and reliable network. Optus will draw on SingTel's regional presence and expertise, and Vodafone will draw on its global experience in rolling out 3G networks around the world.

Optus and Vodafone will continue to provide completely separate customer services and compete for customer business.

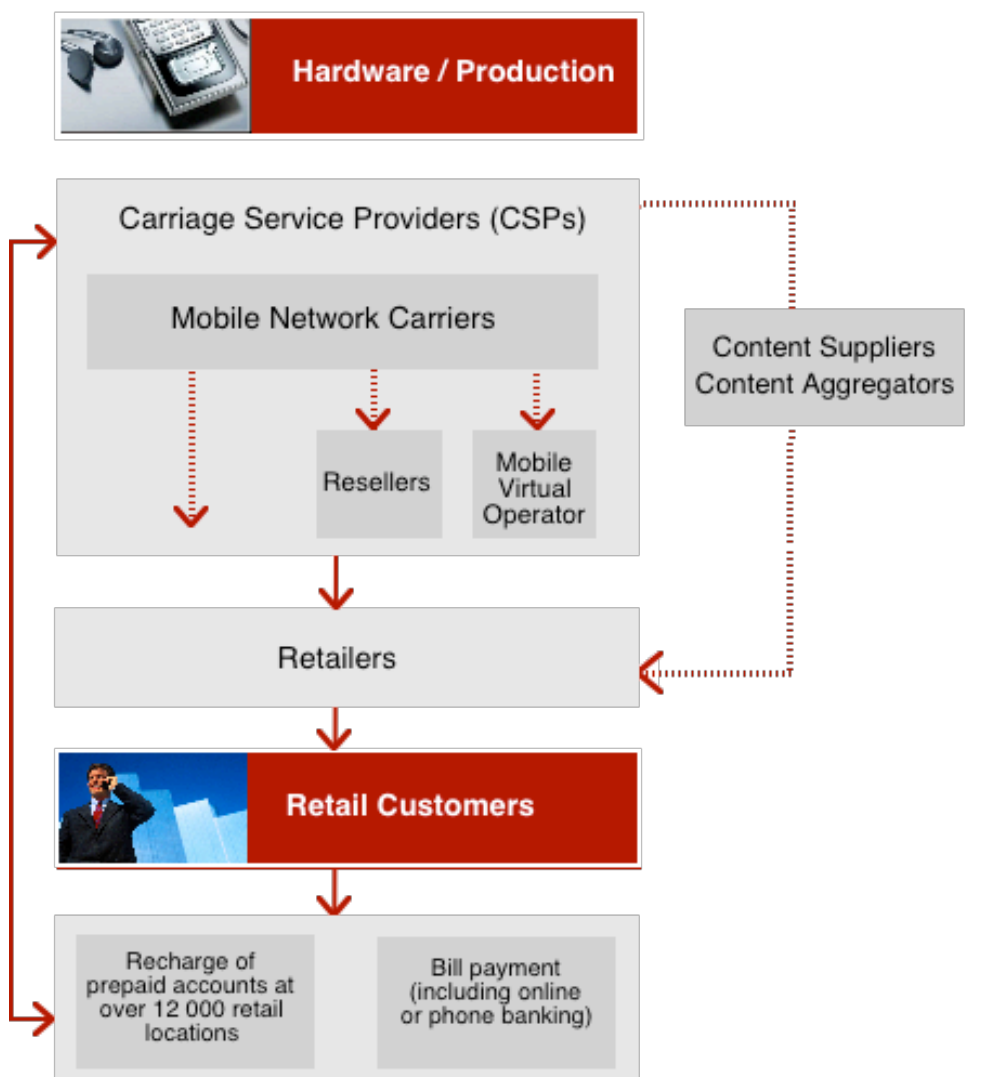
Sources: Optus and Vodafone Media Release 2004, 'Optus and Vodafone Australia announce plans to roll out shared 3G network', 26 August; Telstra Media Release, 'Australia's first 3G network sharing to expand and accelerate customer access to world leading mobile services'.

With the evolution experienced in the mobile telecommunications industry over the last 5 years, it is expected that future growth will only be limited to consumer demand and carriers ability to pay for services and products.

2.2 Australian mobile telecommunications: current industry structure

The mobile telecommunications industry is one of the fastest growing telecommunications markets. Figure 2.2 illustrates the current structure of the industry, which includes all calls from mobile phones to either fixed or other mobile phones. In addition to the connections illustrated in figure 2.2, industry participants also engage with a number of government, industry and consumer organisations and sectors (listed in appendix C).

Figure 2.2

THE MOBILE TELECOMMUNICATIONS INDUSTRY

Some industry participants operate in multiple sectors. This is particularly true for the carriage service providers, which tend to provide retail services too. Other industry members operate exclusively in one sector, particularly the hardware sector.

The remainder of this section provides an overview of the main activities of each sector in the Australian mobile telecommunications industry.

Hardware

There are two distinct elements in the mobile telecommunications hardware sector: *infrastructure*, which supports the volume of mobile telecommunications services, and *end-users' hardware*, which is owned and operated by individuals when using mobile telecommunications services. The hardware sector includes several large global firms and many smaller firms, most of which provide end-user equipment.

Infrastructure hardware

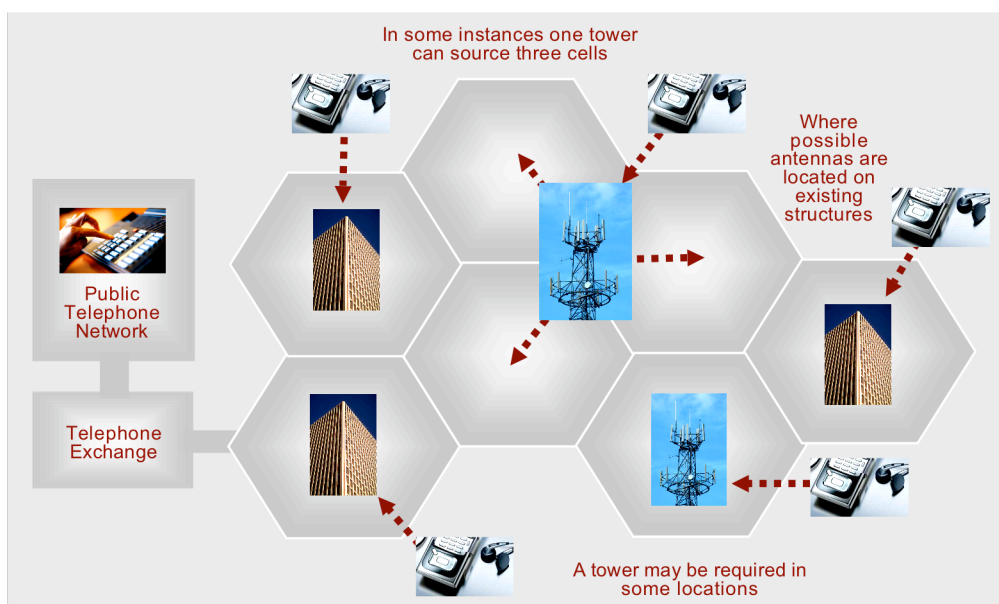
The infrastructure component of the hardware sector includes: base stations, switching equipment, antennas and towers. Activities in the infrastructure sector involve installing and maintaining the extensive network, as well as supporting the design, construction and installation of the infrastructure. The mobile network operators own the infrastructure, but tend to outsource its maintenance.

The major providers of infrastructure hardware products in Australia are Ericsson, Nortel and Nokia. Appendix D describes the infrastructure supporting mobile telecommunications in more detail.

The operation of the main infrastructure components used in mobile-to-mobile and mobile-to-fixed calls are represented in figure 2.3.

Figure 2.3

THE NETWORK REQUIRED TO MAKE A MOBILE CALL



Source: Mobile Carriers Forum, 'How does a mobile phone network operate?'.

End-user hardware

The end-user component of the hardware sector includes the equipment owned and operated by individuals to access mobile telecommunications services. This includes handsets, motor vehicle hands-free kits, earpieces and mobile phone cases. In the year to June 2005, 7.8 million handsets were supplied to the Australian market, meeting the demand of both new subscribers and existing subscribers wishing to update or replace old handsets. Of the handsets supplied, approximately 85 per cent were GSM and 3G handsets and 15 per cent were CDMA handsets.¹⁰

The development of mobile telecommunications services, in addition to voice services, has been associated with ongoing innovations in handsets. New mobile handsets can now send and receive data, pictures and video clips. 3G handsets also enable the user to video call any personal computer in the world that has a webcam

¹⁰ Industry statistics provided by AMTA, <http://www.amta.org.au/>.

and broadband connection. Moreover, many handsets in Australia have 1.3 megapixel cameras that allow customers to take print quality digital images with their mobile phone. Box 2.3 shows how valuable camera phones can be.

Box 2.3

SPIDER VICTIM SAVED BY CAMERA PHONE

When a huge spider bit British chef Matthew Stevens, he photographed it with his camera phone, presuming friends would never believe the story. It was a decision that may have saved his life.

The 23-year-old collapsed soon afterwards. As doctors fought to save his life, he remembered the picture, which had been sent to Bristol Zoo in western England.

Experts at the zoo recognised the creature as the Brazilian Wandering Spider — one of the deadliest spiders in the world — and doctors were able to adapt their treatment suitably.

Doctors were able to treat Stevens by giving him oxygen and increasing the flow of saline into his blood to flush the toxins out of his system, and he was discharged the next day.

Source: Herald Sun (27/04/2005) 'Spider victim saved by camera phone'

Carriage service providers

Carriage service providers (CSPs) supply telecommunications services to the public using carrier network infrastructure. In 2004-05, there were 27 CSPs operating in Australia. This includes four mobile network carriers, which operate their own mobile networks.

Mobile network carriers

Nationally, four mobile network carriers — Telstra, Optus, Vodafone and Hutchison — own and operate six mobile networks. They also hold licences to use spectrum space needed for telecommunications services and offer a variety of mobile services to customers using their networks (see box 2.4).

Box 2.4

BACKGROUND ON SPECTRUM SPACE AND LICENSING**What is Spectrum Space?**

Spectrum space is a pre-determined multi-dimensional area. The extent of a spectrum allocation can be pictured as a cube. The floor of the cube represents the geographic area, while the height of the cube is measured in terms of radiofrequency bandwidth.

Spectrum licensing

In Australia, spectrum licensing was introduced by the *Radiocommunications Act 1992*. Spectrum licences authorise the use of spectrum space and give licensees the freedom to deploy any device from any site within their spectrum space for a fixed non-renewable period (15 years), provided they comply with stringent out-of-band and out-of-area constraints aimed at avoiding interference with their neighbours.

Source: Australia communications authority (ACA) 1999, *PCS 2000 Spectrum Licence Allocation 1.8 GHz Bands Applicant Information Package*,
http://auction.aca.gov.au/auction_results/pcs_2000_results_page/aip_pcs2000.asp.

Resellers

Resellers are also considered CSPs, and in 2003-04 there were almost 90 resellers in the Australian market. Examples of resellers in Australia include, but are not limited to, Primus Mobile (Telstra CDMA and GSM), SIMplus (Optus) and B-Digital (Optus).

In contrast to mobile network carriers, resellers do not necessarily own network infrastructure or have a spectrum allocation. Instead, they purchase end-to-end mobile services from the mobile network operators and bill customers in their own names.

Mobile virtual network operators

Mobile virtual network operators (MVNOs) are also regarded as CSPs and offer mobile services to customers using a third party's network. For example, Virgin Mobile and AAPT are MVNOs that purchase wholesale mobile capacity from Optus and Vodafone, respectively. Although there is some industry debate regarding what exactly constitutes a MVNO, most agree that they:

- bring existing and well-known consumer brands to a mobile retail operation;
- usually use existing networks of a mobile carrier, but establish a technical support layer that replicates the carrier's mobile switching centre;
- operate their own prepaid and post-paid billing, value added services (voice mail box, etc) and facilities; and
- generally have control over their subscriber information, independent of any mobile carrier.¹¹

One of the factors underpinning the emergence and growth of MVNOs is their ability to use existing networks and thus avoid the capital investment required to build their own network.

Content service providers, content aggregators and program developers

Content service providers

Content service providers deliver information and entertainment services, acting as a 'middleman' between mobile network operators and CSPs. The information is sourced and purchased from a number of channels before it is structured and bundled in such a way that it can be distributed over mobile networks. Thus, these mobile 'information-bundlers' add value to the mobile entertainment value chain by delivering useful content in a format appropriate for mobile distribution.

The relationship between mobile network operators and content service providers has been redefined with the introduction of 3G mobile services. The content available through 3G services is a key distinguishing feature between second generation and third generation technology. Alliances between carriers and content providers give ready access to the latest entertainment services.

There are more than 300 content providers in the mobile telecommunications industry, a handful of which are described below.

¹¹ Australian Competition and Consumer Commission (ACCC) 2003, *Mobile Services Review 2003: An ACCC Discussion Paper*, April.

- Content providers for Hutchison make available a wide range of content including:
 - *news* supplied by ABC, Reuters, Sky News and WeatherZone;
 - *sport* provided by Fox Sports, Essendon, Cricket Australia and Sportal;
 - *comedy* made available by the Comedy Channel;
 - *music* supplied by Sony BMG and Warner; and
 - *general entertainment information* provided by HWW, which supplies restaurant and bar reviews and listings and ‘Your Movies’, the first m-site (a website formatted especially for a mobile phone).
- Optus and Ninemsn have announced plans for a strategic alliance to partner on the provision of unique Internet and mobile services. Under the plan, Optus mobile and Internet customers will enjoy a convergent information and communications experience, benefiting from Publishing and Broadcasting Limited (PBL) content and MSN services combined with high speed access via Optus broadband and 3G. Services available include:
 - *unified personal information and messages*, through which customers will be able to access email and instant messaging via a personal computer or phone and unified messaging via SMS, voicemail and email;
 - *personal data management*, where for the first time, customers will be able to synchronise their calendars or contact lists between email and MSN Messenger on their phone or personal computer; and
 - *exclusive content events*, where Optus and Ninemsn will draw on PBL’s rich resources to develop unique content for mobile and broadband, such as behind the scenes footage on photo shoots, parallel storylines on selected television shows, or the recent Logies red carpet exclusive interviews.

Boxes 2.5 to 2.7 describe additional alliances between content providers and carriers.

Box 2.5

MOBILE TELEVISION

The next wave of mobile technology has started with Mobile TV set to become a reality. Mobile TV runs over DVB-H, a new technology allowing simultaneous transmission of multiple channels of television, radio, video, audio and Internet Protocol (IP) data to a range of multimedia devices including mobile phones, personal digital assistants (PDAs), personal computers and other handheld devices.

In Australia, Nokia has joined forces with The Bridge Networks for Australia’s first Mobile TV trial, which is expected to commence in 2005 with over 500 users.

The trial users will be able to view real-time television programs on a Nokia 7710 smartphone equipped with a special accessory to receive mobile television broadcasts. The smartphone also enables direct links to the Internet for access to background information on television programs or sports results.

Source: Information provided by Nokia.

Box 2.6

BIG BROTHER — AN ALLIANCE BETWEEN 3, CHANNEL 10 AND ENDEMOL

The latest series of *Big Brother* on 3 was enormously successful from the perspective of the program, the fans and 3 mobile customers.

The in-program integration saw several housemates receive a video message from loved ones on a 3 mobile handset, and select housemates were the recipients of live video calls on their eviction night.

Big Brother on 3, allowed 3 customers to interact with the *Big Brother* program through a variety of ways including, Live Cam TV, Live Chat with evicted housemates, Real Tones, half-hourly text updates, daily text summaries of what happened in the house, alerts, evictee video interviews, video highlight clips and much more.

3 customers always wanted to be part of the action and the results found 3 mobile customers would watch the show and then access the *Big Brother* Live Cams on their mobiles as soon as the show ended to remain connected to the action.

Overall, more than 2 million *Big Brother* live streams on 3 mobile were initiated during the series, with the total length of live streams equating to 19 years, 279 days and 8 hours.

By comparison to *Big Brother 4* content on 3 mobile, Live Cams increased by 484 per cent, video streaming increased by 1086 per cent and text increased by 2603 per cent.

Source: Information provided by Hutchison.

Box 2.7

NOKIA LAUNCHES MOBILE MUSIC SOLUTION FOR OPERATORS WORLDWIDE

Nokia, together with Loudeye Corp, unveiled a music platform for mobile operators. The white label platform enables operators to launch a comprehensive branded mobile music service for their customers with a minimum amount of effort and resources.

The mobile music platform is designed to allow users to browse, search, listen and download (either to the device or the user's personal computer) full-length songs and ringtones using an operator branded music application on their mobile device. Customers can also use their personal computer and an operator customised personal computer client to access the music shop via the Internet.

'We see music as one of the key 3G services driving operator revenues. The Nokia-Loudeye music solution offers the necessary elements to enable operators to launch a comprehensive mobile music service for their customers,' said Philip Taylor, Director, Strategy Analytics. 'Not only does it support wireless music downloads, but it has strong personal computer support through its collaboration with Microsoft, which is crucial for reliable storage and synchronisation'.

Source: Nokia 2005, 'Nokia Launches Mobile Music Solution for Operators Worldwide', Media Release, 15 February.

Content aggregators

Content aggregators are entities that are neither a carrier nor a reseller, but provide services through content linked to other providers' products. They typically manage multiple content providers and supply services including: sourcing, reporting, formatting for multiple streams, quality control and cross referencing. Content aggregators operating in Australia include:

- Legion Interactive — which facilitates interactive communications through Interactive Voice Response (IVR), Short Message Services (SMS), Multimedia Message Services (MMS), Interactive Voice Messaging (IVM), email, the Internet, Wireless Application Protocol (WAP) and interactive television;
- Infospace — which delivers application services to leading wireless carriers; and
- iTouch — a Wireless Application Service Provider (WASP) offering mobile services to both consumers and businesses through an international presence.

Aggregators also add value to CSPs by negotiating intricate and time-consuming distribution deals with the individual network carriers, resulting in wider content distribution. For the carriers, content aggregators create valuable mobile data applications by combining content from numerous sources and integrating it into a single interface. Content is increasingly being seen simultaneously across fixed and wireless access.

Program developers

The expansion of services available via mobile devices is supported by the work of program developers who use industry development tools to create new and innovative applications for mobile phone users. The work of developers can create further market opportunities for content providers and aggregators, as well as other program developers.

Program developers are often supported by mobile businesses, which provide access to development tools and other supports. Box 2.8 describes a competition to encourage program developers to design the latest next generation services.

Box 2.8

FRONTIER: ERICSSON'S APPLICATION DEVELOPER'S COMPETITION

Frontier is an annual competition in partnership with The Australian IT and Ericsson Mobility World, Ericsson's global partnering program designed to accelerate the development and market deployment of innovative mobile and broadband applications and services.

The only competition of its kind in Australia to drive new services in fixed and mobile communications, Frontier offers developers and content providers the chance to enter anything from multimedia animation to business automation solutions.

The Frontier Judging Panel for 2005 include Telstra, Vodafone, Optus, Hutchison and Sony Ericsson.

Frontier finalists for 2005 include:

- *Girl Friday* — an interactive sitcom series for broadband and mobile platforms that is aimed at the 16 – 30 year old market. Subscribers view the video program on their personal computer or mobile device. Subscribers can also send the *Girl Friday* characters emails, text or multimedia messages. The pilot was produced with the assistance of the Australian Film Commission, Film Victoria's Digital Media Fund and Digital Pictures Melbourne;
- myTV — a new concept from HWW for delivering video content to mobile phones. Subscribers choose what they want to watch and when they want to watch, and content is delivered as a personalised television channel to the subscriber's handset. myTV will set a new benchmark in mobile content and is due for operator release in the next 6 months; and
- FriendsWhoForward — an application from Amethon Solutions that tracks when a subscriber forwards content to another subscriber. The key benefit for operators is that they can register which content is popular amongst certain customer demographics. Users are also encouraged to make the most of the capabilities of their phones, including multimedia functionality through creative marketing rewards programs. The product will be ready for operator release within the next 3 months and is also patent pending (because it is the first application of its type in the world).

The grand prize is a trip to next years (February 2006) 3GSM World Congress being held in Barcelona. All finalists receive Sony Ericsson mobile phones, as well as professional advice from leading Australian business consultant, MAP Ventures.

Source: Information provided by Ericsson Australia.

Retailers

Retailers offer mobile services to end users on behalf of CSPs. Customers can purchase mobile telecommunications hardware and services from three types of retail outlets:

- speciality outlets that may be branded and sometimes owned by a CSP;
- outlets that sell mobile telecommunications hardware and services as part of a broad range of products; and
- online sellers.

Most CSPs have their own retail shops where customers can purchase the hardware they require to access mobile services and to enter into arrangements to use the network hardware infrastructure. This access may be achieved via a prepaid arrangement or on an ongoing post-paid basis where customers are billed for the services they use. The exclusive retail outlets of mobile network carriers are:

- Hutchison — ‘3’ Shops and Allphones;
- Telstra — Telstra Shops; and
- Optus — Optus World.

Vodafone stores are owned by a partnership including Digicall Australia and First Mobile. These stores retain the Vodafone brand and provide retail and customer services for Vodafone.

There are also many ‘non-branded’, but still speciality telecommunications or electronics retail outlets, that offer hardware and services of multiple mobile network carriers.

When mobile telecommunications were initially introduced into the Australian market, hardware and services could only be purchased from these types of speciality shops. Over the last ten years, there has been a significant change in the number and type of retail channels where consumers can purchase mobile phones. The branded and specialty shops now provide services alongside a broad range of non-specialty retail stores. Today, it is possible to obtain mobile telephones, products and equipment from retail outlets including, but not limited to, convenience stores, petrol stations, supermarkets and Australia Post.

The most recent addition to the sale of mobile phones and services is online stores, where customers can buy a range of end-user hardware and mobile phone post-paid plans, in addition to ordering, activating and recharging prepaid mobile products.

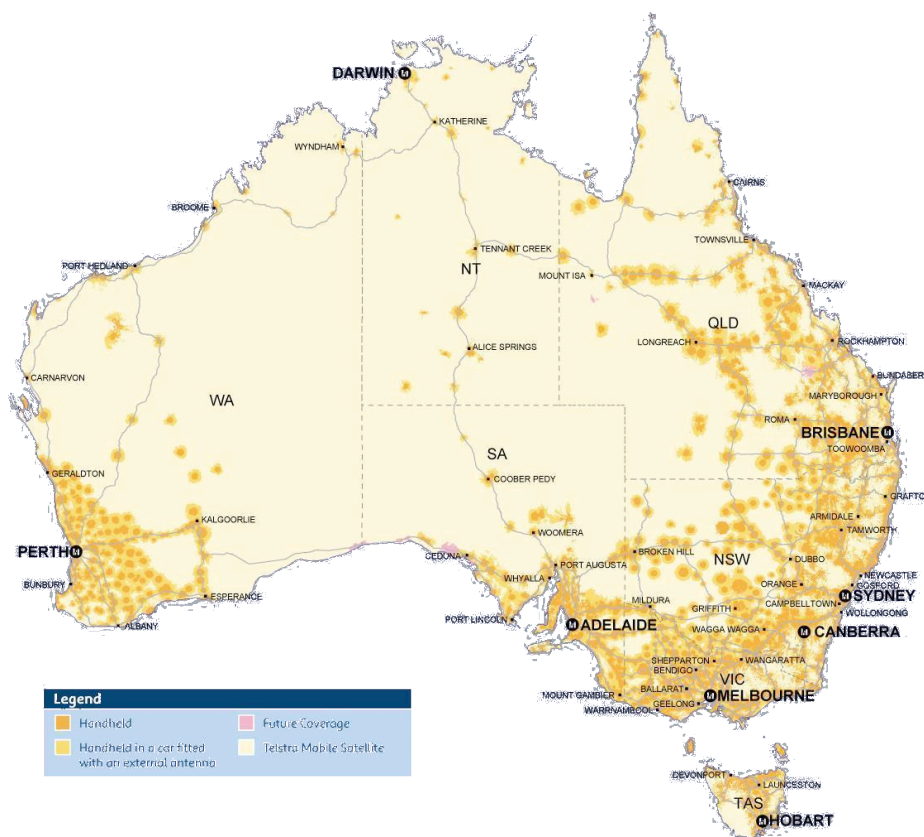
2.3 Mobile telecommunications coverage and market share

Mobile coverage

Australia’s terrestrial mobile phone networks (GSM and CDMA) now reach over 98 per cent of the population and cover 20 per cent of the Australian landmass (see figure 2.4).¹²

¹² Telstra Media Release 2003, ‘Telstra Country Wide \$250 million package to customers’, 4 June.

Figure 2.4

INDUSTRY COVERAGE, 2004

Source: Information provided by AMTA members.

Extensive geographic coverage makes mobile telecommunications services available to people living in and visiting rural and remote parts of Australia. Box 2.9 provides one example of the extensive mobile service network in Australia.

Box 2.9**OPTUS FINDS A DIAMOND IN THE ROUGH**

Optus provides GSM coverage over satellite to the Kimberly Diamond Company in far north Western Australia where previously satellite phones were the only form of communication. Kimberly Diamond Company is an independent diamond producer focused on the mining and marketing of high-value rough diamonds. Due to the remoteness of the mine site, it was critical to enhance its communications, as current modes were minimal. This was the first commercial deployment of GSM over satellite in Australia.

Source: Information provided by Optus.

Mobile network coverage provided by individual mobile network providers varies from place to place depending on where they have invested in networks.¹³ However, mobile network carriers also enter into resale agreements with other mobile network carriers to offer a broader product range or to offer service more effectively in regions where their network has little or no coverage. For example, to facilitate more extensive geographic coverage than licence areas alone, Hutchison has entered into 'roaming' agreements with Telstra that allow its customers to access the mobile service networks across Australia.

Optus, on the other hand, has increased the footprint of its GSM network. Over the past five years, Optus has doubled its coverage in New South Wales, Queensland and Victoria and increased the footprint of its network in rural and regional Australia by over 200 000 square kilometres.

A substantial share of the resources devoted to expanding mobile telecommunications to rural and remote Australia has come from the Australian Government.¹⁴ The 2004-05 Regional Partnerships for Growth and Security, for example, form part of the Commonwealth's \$147.3 million package of initiatives responding to the Telecommunications Service Inquiry to improve the level of telecommunications services to regional and rural Australia. Programs sponsored through this initiative include:

- Mobile Phone Highway Program — received \$22.7 million to facilitate near continuous mobile phone coverage along almost 10 000 kilometres of 16 major highways. This has increased GSM mobile coverage on some of the major road transport routes in regional Australia;
- Mobiles for Towns — over 500 programs were funded with \$21.8 million over three years from 2001-02 to increase mobile phone coverage for 132 towns with populations over 500;
- Regional Mobile Phone Program — received \$49 million over two years from 2002-03 to improve mobile phone coverage to:
 - 55 towns with populations of less than 500;
 - 62 lengths along 34 regional highways; and
 - the southwest of Western Australia under the Wireless West project.

A final and ongoing element of this initiative is described in box 2.10.

¹³ Each mobile network provider has publicly available maps that provide detail of the specific mobile coverage provided by their networks.

¹⁴ Department of Communications, Information Technology and the Arts (DCITA), A Users' Guide to Australian Telecommunications 2002, 12 November 2002. (http://www.dcita.gov.au/Article/0,,2_3-3_143-4_112188,00.html) p. 3. and advice from industry.

Box 2.10

EXTENDING MOBILE TELECOMMUNICATIONS COVERAGE

The Australian Government has provided \$15.6 million in funding to improve mobile phone coverage to 62 towns in regional and remote Australia. It is estimated that the project will see more than 30 000 people, across 45 000 square kilometres, receive new or improved mobile coverage and wireless data services.

The project will benefit 21 Indigenous communities, farming, mining, agricultural and tourism centres, as well as people travelling on regional highways near these towns. Telstra was awarded the tender to complete this work between January 2005 and November 2006.

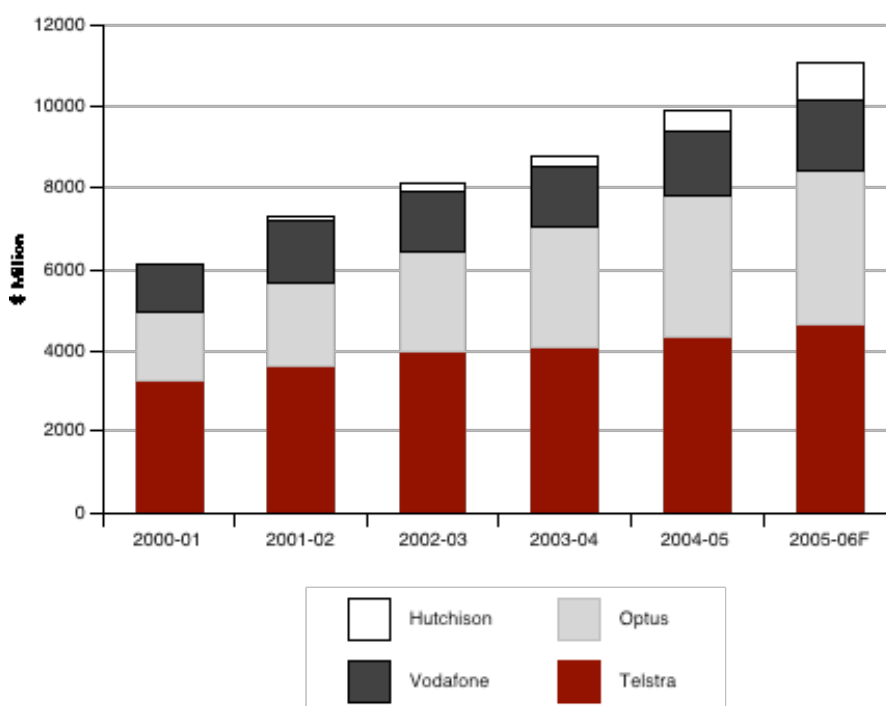
Source: Information Technology and the Arts 2004, 'New contract to improve regional and remote mobile coverage', Media release by Senator the Hon Helen Coonan, Minister for Communications, 1 September 2004; Telstra Media Release, 'Mobile phone coverage and wireless data delivered to remote towns'.

Market share

Figure 2.5 illustrates the mobile revenue market share of the four major carriers. The figure shows that although Telstra still has the largest market share, Optus, Vodafone and Hutchison are continuing to grow.

In 2004-05, Telstra had 44 per cent of the market share, followed by Optus with 35 per cent, Vodafone with 16 per cent and Hutchison with 5 per cent. In 2005-06, it is expected that Telstra's market share will decrease to 42 per cent, Optus' market share will decrease marginally to 34 per cent, Vodafone's market share will remain the same and Hutchison will increase its market share by 3 percentage points to 8 per cent.

Figure 2.5

MOBILE REVENUE MARKET SHARE BY MOBILE NETWORK CARRIERS, 2000-01 TO 2005-06

Note: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 41.

Chapter 3

Industry growth

3.1 Introduction

The mobile telecommunications industry has been one of the fastest growing telecommunications markets. Over the last decade, there has been continued growth in mobile services, and the industry is regarded as one of the largest growing sources of revenue in the telecommunications industry. In 2004-05, there were more than 16 million mobile phones used by over 80 per cent of the Australian population. It is expected that this will increase to 19 million mobile phones used by over 94 per cent of the population in 2005-06.¹⁵

Over the past five years, Australia's mobile telecommunications revenue grew at an average of 14 per cent per year, and the estimated revenue of the industry in 2004-05 was approximately \$9.9 billion.¹⁶

This chapter looks at features of Australia's mobile telecommunications industry growth, considering:

- subscriber growth and characteristics; and
- competition in the industry.

3.2 Subscriber growth and characteristics

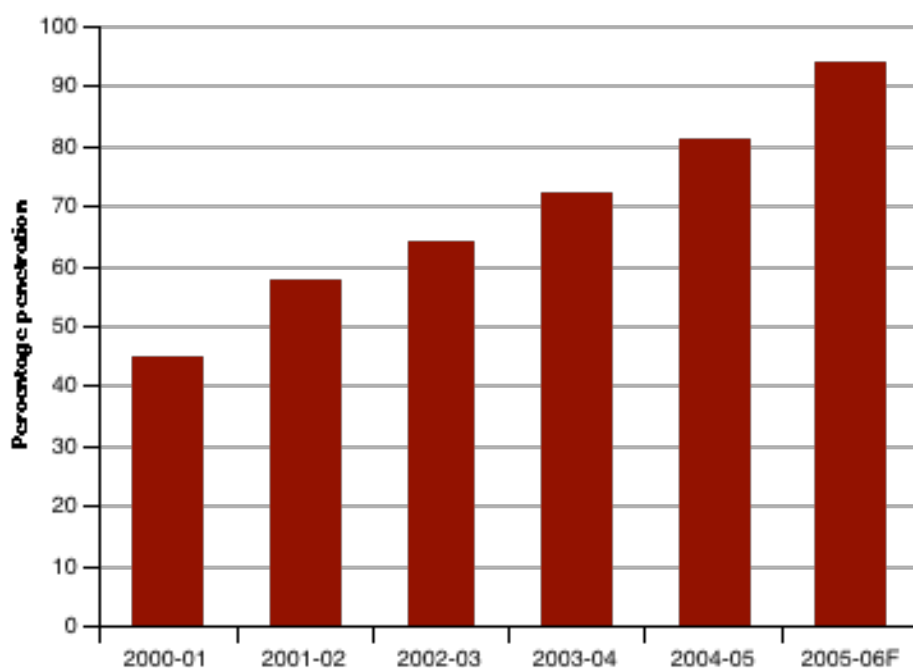
In 2004-05, Australia's mobile penetration rate (i.e. mobile phone services per 100 inhabitants) reached 81.3 per cent (or 16.2 million mobile subscribers). It is estimated that the mobile penetration rate will exceed 94 per cent (or almost 19 million subscribers) in 2005-06.¹⁷ Figure 3.1 illustrates the increase in the mobile penetration rate in Australia from 2000-01 to 2005-06.

¹⁵ Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

¹⁶ Ibid., p. 38.

¹⁷ Ibid., p. 38.

Figure 3.1

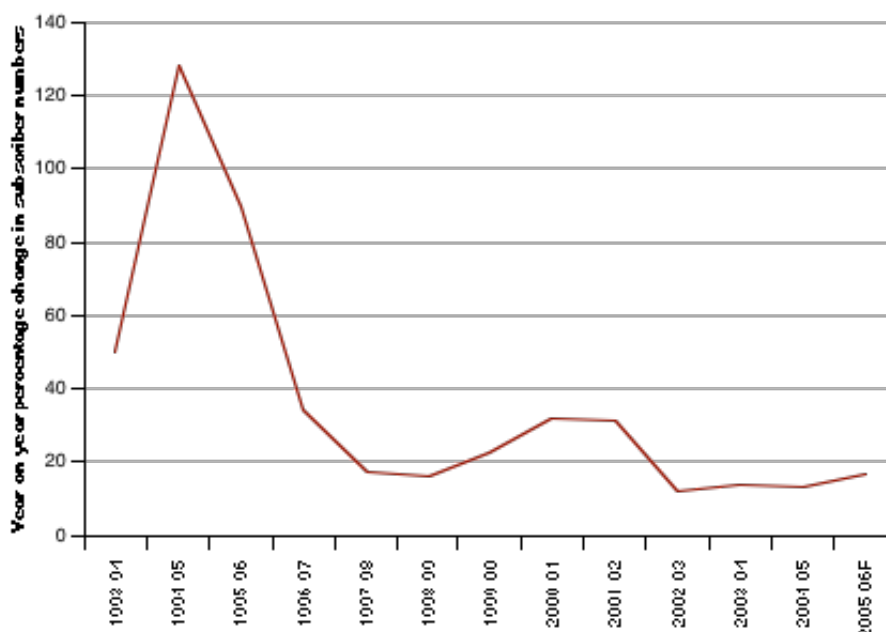
MOBILE PENETRATION RATE, 2000-01 TO 2005-06

Note: F indicates forecast values.

Source: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

Figure 3.2 illustrates the strong growth in subscriber numbers since the early 1990s. The year-on-year rate of growth in subscriber numbers had a substantial peak of 128 per cent between 1993 and 1994 (as Vodafone, Telstra and Optus launched their GSM networks). In recent years, the growth rate has not been as strong as a result of the high penetration rate in the market, and future growth is expected to slow as the market moves from its growth phase to maturity.

Figure 3.2

ANNUAL GROWTH IN MOBILE SUBSCRIBERS, 1993-94 TO 2005-06

Note: F indicates forecast values.

Source: 1993-1999 data: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29. 2000 and 2005F data: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

Peaks in subscriber growth appear to be associated with the introduction of new networks. As described in chapter 2, the second generation GSM network was introduced in 1993 and subscriber growth increased by 128 per cent in 1994. The jump in subscriber growth rates in 1999 occurred alongside the introduction of the CDMA networks.

Australia's first 3G network commenced in April 2003 when Hutchison launched 3 in Sydney and Melbourne. Compared to GSM, the introduction of 3G services has not had an equally significant effect on subscriber numbers. Since its introduction, year-on-year growth has decreased slightly from 13.9 per cent in 2003-04 to 13.4 per cent in 2004-05. These growth numbers do not reflect the full impact of 3G services, which is likely to be observed over the coming years as mobile network carriers roll out these networks. Annual growth in 2005-06, for example, is expected to increase to 16.9 per cent.

Box 3.1 provides further information on the growth of mobile phone use.

Box 3.1

AUSTRALIA'S MOBILE PHONE USE TO EXCEED 100%

Australia's mobile penetration rate surpassed 'natural saturation' last year, signifying that every Australian who could be using a mobile phone is already using one, according to the International Data Corporation's (IDC) research into the mobile market.

The study, titled 'No Strings Attached: Australian Cellular Forecast and Analysis, 2004-2009,' also finds that 100 per cent penetration in this country will be achieved before the end of 2008. That outlook places Australia in the footsteps of other more mature Western European countries, such as Italy, Sweden and the UK, where mobile phone use already exceeds 100 per cent.

The 3G launch by the nation's three largest wireless network operators this year will reinvigorate and renew interest not seen since the transition from analogue to digital mobile communications more than a decade ago.

Amongst other things, the IDC study finds that the number of Australian mobile phone users will grow by 7.4 per cent to 19.2 million in 2005, with service revenue growing at a slightly faster rate of 8.4 per cent to \$8.7 billion.

Growth in the next five years primarily will come from 3G users, who will constitute a mere 5 per cent of Australia's mobile user base this year but are expected to make up one in three of all mobile phone users in 2009.

Non-voice revenue contribution will rise significantly from 18 per cent of carrier revenues this year to 29 per cent in 2009. Non-voice revenues are poised to exceed \$2 billion after 2006, when 3G services become commonplace.

Major factors driving future industry growth include the multiple-SIM phenomenon and increased substitution of landline traffic by mobiles, and in the longer term, fixed-to-mobile convergence.

Source: Computer World 2005, 'Australia's Mobile Phone Use to Exceed 100% in 3 Years'.

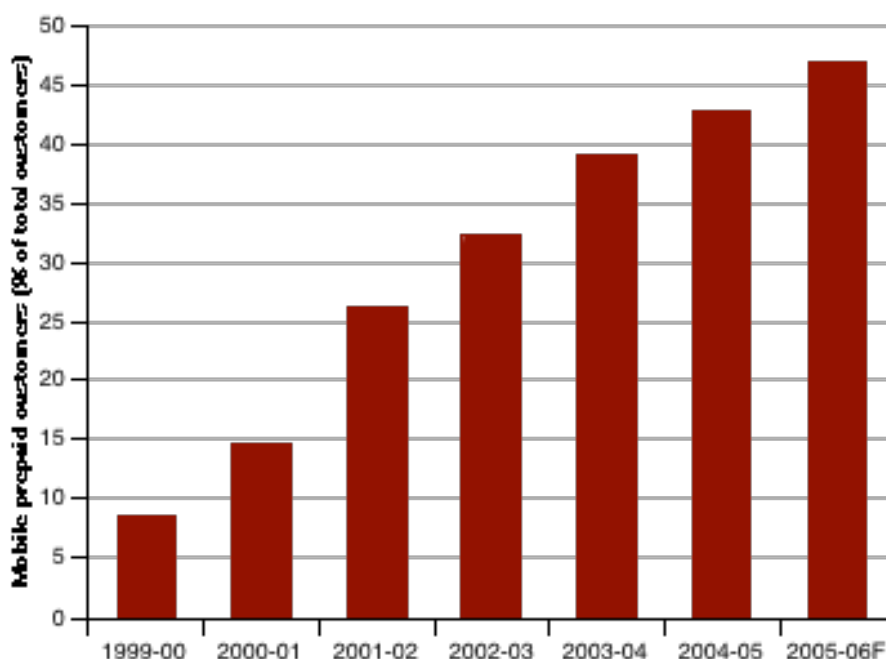
Prepaid mobile services

Recent subscriber growth has been driven mainly by the continued increase in prepaid customers. From 1999-00 to 2004-05, the number of prepaid customers in Australia increased by 34 per cent.¹⁸ In 2004-05, 43 per cent of all mobile phone services were prepaid, compared to 39 per cent in the previous year. It is estimated that 47 per cent of all mobile subscribers will be prepaid customers in 2005-06.

¹⁸

Credit Suisse First Boston 2005, op. cit., p. 38.

Figure 3.3

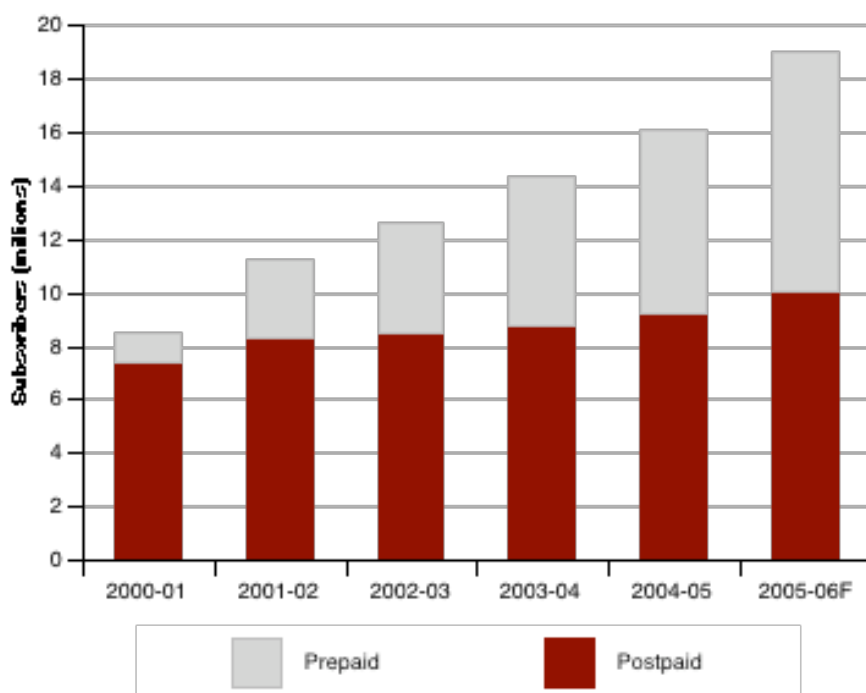
MOBILE PREPAID SUBSCRIBERS AS A PERCENTAGE OF ALL SUBSCRIBERS, 1999-00 TO 2005-06

Note: F indicates forecast values.

Source: 1999-1999 data: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29. 2000 to 2005F data: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

This continued growth in prepaid customers in 2004-05 underpinned the overall growth in subscriber numbers (see figure 3.4). Between 2003-04 and 2004-05, around 70 per cent of the growth in subscribers was due to growth in prepaid subscribers.

Figure 3.4

PREPAID VERSUS POST-PAID SUBSCRIBERS, 2000-01 TO 2005-06

Note: F indicates forecast values.

Source: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

Customer evolution from post-paid plans to prepaid plans accounts for the majority of new connections. For some customers the appeal of capped plans is greater than the appeal of a subsidised new handset.

The trend toward greater use of prepaid mobile telecommunications services evident in the Australian market is also occurring worldwide. Globally, customers using prepaid cards increased from one per cent in 1996, when prepaid cards were introduced, to nearly 45 per cent by the end of 2004.¹⁹

Short message service (SMS) and multimedia message service (MMS)

SMS services are another major source of growth in the mobile telecommunications industry. During 2003-04, almost 5.1 billion SMS messages were sent, reflecting an increase of 28 per cent from the previous year (see figure 3.5).²⁰

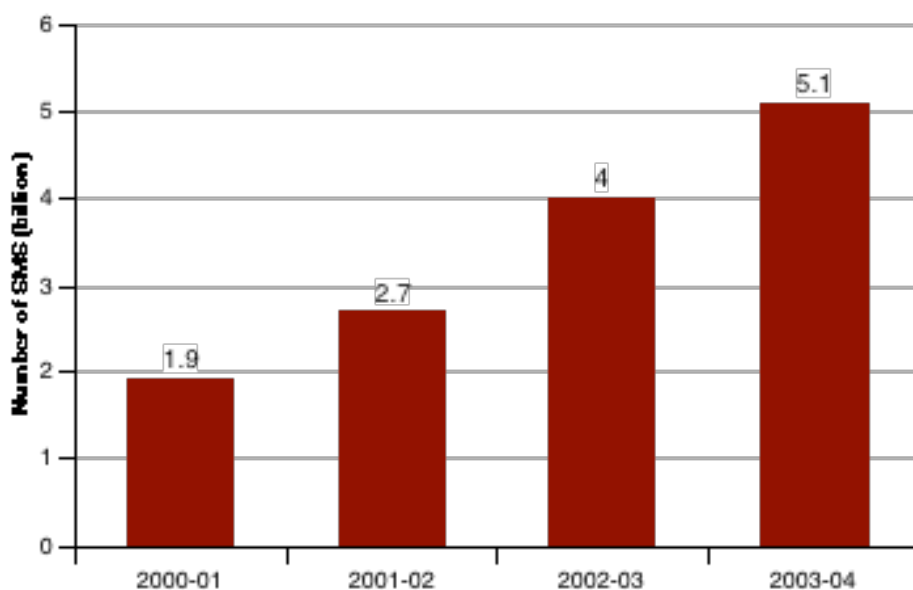
Similarly, the use of multimedia message service (MMS) is increasing in the mobile telecommunications market, with 13.7 million MMS messages sent in 2003-04.²¹

¹⁹ Organisation for Economic Co-operation and Development, *Communications Outlook 2003*, OECD.

²⁰ Australian Communications Authority, 2005, *Telecommunications Performance Report 2003-04*, Melbourne, p. 76.

²¹ Ibid., p. 77.

Figure 3.5

BILLIONS OF SHORT MESSAGE SERVICES (SMS), 2000-01 TO 2003-04

Source: Australian Communications Authority 2005, *Telecommunications Performance Report 2003-04*, Melbourne, p. 76.

Boxes 3.2 and 3.3 outline some of the many innovations in the use of SMS.

Box 3.2

SMS YOUR WAY OUT OF A PARKING FINE

For many Australian motorists, gone are the days of clock watching to avoid parking fines. The new breed of parking meters sends a warning text message to drivers before their parking time expires.

As well as sending a warning text message before the parking period expires, some of the meters give motorists the choice of topping up their time via their mobiles. However, a spokeswoman from Reino said that consumers will not be able to top up past the time limit on the space.

Paying by phone incurs a 30 cent fee, plus local call costs. It involves registering a credit card number with the service and then, after having parked, calling a number on the meter, entering the meter's identification number and the parking fee. A message is then sent to the meter, which prints a receipt.

Source: Sydney Morning Herald 2005, 'SMS your way out of a parking fine'.

Box 3.3

KAZ AND NAB EMPLOY SMS FOR INTERNET SECURITY

In an Australian first, KAZ and the National Australia Bank (NAB) today launched a new service that adds an additional layer of security to the NAB's Internet banking platform.

The service works via a unique randomly generated code sent to an Internet Banking customer at the beginning of a third party funds transfer transaction, which must be entered to authenticate the user before a transfer can be made. The unique code is generated automatically and is sent to the user's mobile phone via SMS.

Mike Foster, Chief Executive Officer of KAZ said the company was delighted to collaborate with the NAB to develop and implement the platform: 'In order to balance customers' need for ease of access versus the need to block Internet fraudsters, the NAB was looking to provide two-factor user authentication that was highly personal but simple to execute.

'In considering various options, it became apparent that a randomly-generated code, sent by SMS to the registered mobile of an authentic user, was a unique and relatively simple way to add another layer of security.'

The free service is the result of 14 months of collaboration — including a three month pilot project between NAB and KAZ on solutions to minimise the company's exposure to Internet banking fraud, which according to Australian Banking Association, is estimated to cost Australian banks around \$25 million each year.

The service is being rolled out to NAB customers across Australia over 2005.

Source: National Australia Bank 2005, Media Release 2 May.

Optus, Telstra and Vodafone launched premium SMS in May 2003. Initially premium SMS services related to reality television and media competitions, but the breadth of services continued to grow. New services, for example, allow television viewers to submit comments to television shows and to take part in interactive treasure hunts.

Premium SMS services seem likely to continue to grow, partly as a result of the release of the permanent premium SMS number range, which provides brands with more confidence in adopting the service. Following a successful industry trial of premium rate SMS and MMS using seven-digit 188 numbers, the Australian Communications Authority (ACA) released new number ranges for these services. The new numbers comprise 4000 six-digit numbers starting with 191, 193, 194 and 195 and 300 000 eight-digit numbers beginning with 196, 197 and 199. The allocation of more numbers provided certainty about the availability of numbers for use by companies, allowing marketing activities incorporating premium SMS to be planned in advance.

The industry expects significant increases in premium SMS volumes. *Big Brother* was the first reality show to use premium SMS. But many other shows are now also generating high volumes of premium SMS, including *Australian Idol*, *Getaway* and *Dancing with the Stars*.

Box 3.4 provides additional information on interactive mobile television services.

Box 3.4

ERICSSON LAUNCHES INTERACTIVE MOBILE TELEVISION

Ericsson has used the Milia TV and broadcasting event to demonstrate an application that truly brings interactive television to multimedia mobile devices.

Viewers are able to interact with mobile television shows, via voting or greeting (SMS-to-television or MMS-to-television), just by pushing a response key. Mobile television viewers can access additional services too, such as shopping via the mobile television.

'Our solution makes it possible for viewers to interact with a show they are watching on their mobile device in a whole new way, creating a much richer TV experience with the help of the mobile channel,' said Kurt Sillén, Vice President and Head of Ericsson Mobility World.

Television networks can profit from content fees, additional advertising revenues and paid interactions such as voting, greeting and shopping. And because it opens the way to new television formats, it also widens target groups and builds customer loyalty while giving end users an advanced television experience.

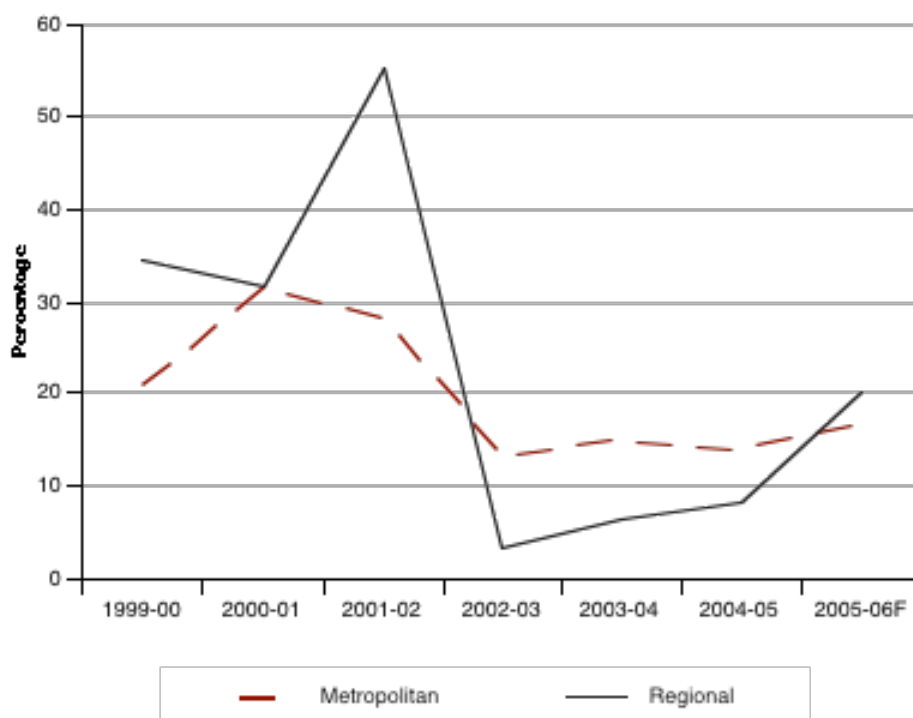
Source: Ericsson 2005, 'Ericsson launches interactive mobile TV'.

Growth in metropolitan and regional markets

Growth in the uptake of mobile telecommunications has occurred in both metropolitan and regional markets, but at different rates. In 2004-05, the metropolitan market accounted for over 89 per cent of mobile revenues. Figure 3.6 identifies the relatively smooth growth rates for revenue in the metropolitan market (peaking at 31.7 per cent in 2000-01), in contrast to the relatively sharp increase in regional revenue growth (55.2 per cent in 2001-02). In 2005-06, revenue growth is estimated to be 16.5 per cent in metropolitan markets and around 20 per cent in regional markets.²²

²² Credit Suisse First Boston, op. cit., p. 48.

Figure 3.6

METROPOLITAN AND REGIONAL MOBILE REVENUE GROWTH (%), 1999-00 TO 2005-06

Source: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 48.

The mobile subscriber market shares in metropolitan and regional areas have remained relatively unchanged since 1999. The market share of metropolitan subscribers was 89 per cent in 1999-00 compared to 89.3 per cent in 2004-05.

3.3 Competition in Australia's mobile telecommunications industry

The Australian mobile telecommunications market offers a very high degree of competition relative to other OECD countries. The OECD, for example, found that out of 27 countries, Australia ranked fifth in the level of pricing competitiveness for business mobile services and third for residential mobile services in 2002.²³ Further, the variety of mobile plans and products in Australia is a function of a highly competitive market.

Another indication of market competitiveness is the rate at which customers change providers, or 'customer churn'. Customer churn identifies the frequency of customers either porting their number to another provider or switching to another provider without retaining their number. Factors that can impact on churn rates include the use of 24-month contracts, early termination charges, porting fees, subscriber identity module locks for prepaid services, mobile number portability and the increasing availability of customer loyalty packages.

²³ OECD 2003, op. cit.

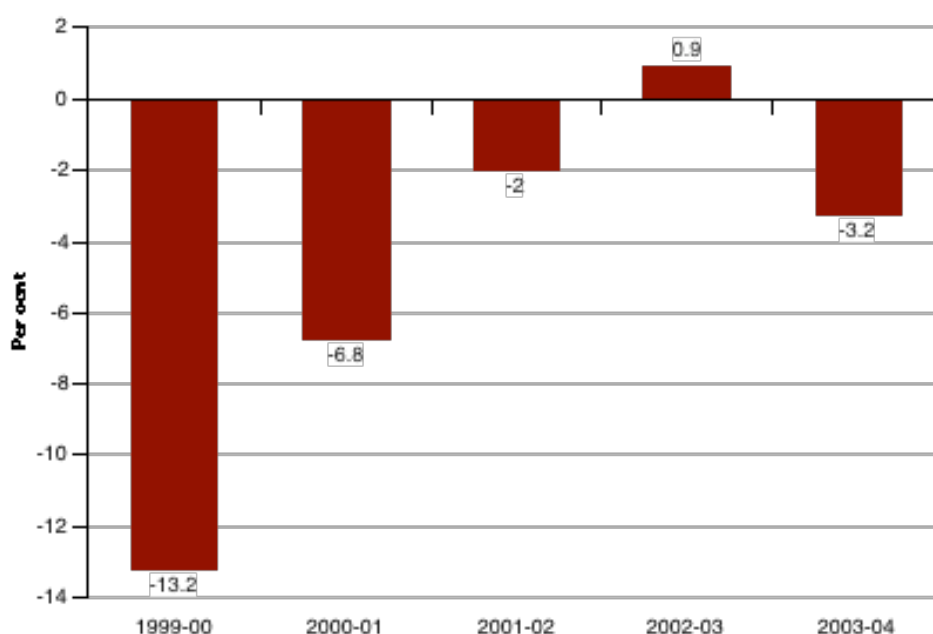
The most recent estimates on customer churn suggest that the customer churn rate is 5 per cent for mobile number portability and up to 20 per cent for switching without keeping a mobile number.²⁴

Trends in retail prices

The recent growth in mobile service subscriber numbers (as described in section 3.2) has occurred during a period of significant decreases in the price of mobile telephony. From 1997-98 to 2001-02, the price of mobile telephony decreased by around 27 per cent.²⁵ The price decreases, however, have become smaller in recent years. A price increase of 1 per cent, for example, was recorded in 2002-03, followed by a relatively small decrease of 3.2 per cent in 2003-04 (see figure 3.7).

Figure 3.7

PERCENTAGE CHANGE IN THE PRICE OF MOBILE TELEPHONY, 1999-00 TO 2003-04



Source: Australian Competition and Consumer Commission (ACCC) 2005, *Telecommunications report: Report 2 - Changes in the prices paid for telecommunications services in Australia 1997-98 to 2003-04*, p. 98.

Substituting mobile telephones for landlines

Since 2000-01, Australia has had more mobile services than fixed services. In 2004-05, there were 16.2 million mobile services compared to 11.4 million fixed services.²⁶ Approximately one quarter of calls placed in Australia are made on a mobile phone.²⁷

²⁴ Australian Communications Authority 2003, *Telecommunications Performance Report 2002-03*, Melbourne p. 89.

²⁵ Australian Competition and Consumer Commission (ACCC), *Telecommunications report: Report 2 Changes in the prices paid for telecommunications services in Australia 1997-98 to 2003-04*, p. 98.

²⁶ Credit Suisse First Boston, op. cit., pp. 35-38.

²⁷ IBISWorld 2005, *J7122 - Mobile Telecommunications Carriers in Australia*, p. 5.

Traditionally, households have had a mobile telephone *in addition to* a fixed telephone. Anecdotally, there is an emerging trend among some customer groups to have a mobile phone service and no fixed telephone at home. Factors likely to be driving this change include the convenience of having a single phone number on which a person is contactable regardless of location, the decreasing price of mobile telephony services that offer a mobile-only household a financially competitive proposition, and the increase in mobile phone usage by the over 50 year customer age group.

Recent research, however, does not confirm these anecdotes, finding that there has been no substitution between mobile and fixed line phones in Australia during the last twelve months. Between June 2004 and May 2005, the volume of households using fixed line phones has remained constant, despite subsidised handsets and well-advertised mobile capped plans.²⁸

On the other hand, the perceptions of substitution are supported by evidence from overseas. Six per cent of households in the United States, for example, subscribe to only wireless service, substituting this for their fixed landline. In addition, a number of subscribers who have kept their landline connection use wireless as a substitute for a second fixed line.²⁹ A similar trend is present in Europe, where mobile-only services are as high as 33 per cent in Finland and Portugal and, on average, are 15 per cent across the region.³⁰

²⁸ Roy Morgan Research Centre 2005.

²⁹ J. E. Nuechterlein and P. J. Weiser 2005, *Digital Crossroads: American Telecommunications Policy in the Internet Age*, The MIT Press, Cambridge, Massachusetts, p. 282.

³⁰ Ovum 2005, 'Fixed Mobile Convergence is Happening Now', *Communications Day*, 23 August 2005, p. 4.

Chapter 4

Industry revenue and value added

4.1 Industry revenue

In 2004, total mobile telecommunications revenue reached \$9.9 billion, representing approximately 30 per cent of total telecommunications revenue.³¹ In the past, growth in subscriber numbers has driven the growth of mobile telecommunications revenue. As the market has matured, a slow down in mobile subscriber growth has slowed the growth in mobile revenue (see table 4.1).

Total year-on-year growth in mobile revenue has declined after peaking in 2000-01 and 2001-02, which had annual growth of 20.7 and 19.3 per cent respectively. In 2004-05, mobile revenue growth was 12.7 per cent, with an expected decrease in growth to 11.5 per cent in 2005-06.

Even though subscriber growth has moderated somewhat during recent years, mobile telecommunications revenue is expected to continue to grow as a proportion of total telecommunications revenue.

Table 4.1

THE MOBILE TELECOMMUNICATIONS INDUSTRY REVENUE, 2000-01 TO 2005-06

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06F
Total revenue (\$b)	6.1	7.3	8.1	8.8	9.9	11.0
Growth (year-on-year)	20.7%	19.3%	11.0%	8.4%	12.7%	11.5%

Note: F indicates forecast values.

Source: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

The increasing importance of data services

The global trend in recent years has been a decrease in average revenue per user (ARPU), reflecting the combined effects of decreasing airtime charges and an increasing proportion of lower spend customers, notably prepaid subscribers (see table 4.2). The downward trend is estimated to continue, and industry players are expected to focus specifically on high-volume, high-spend customers via value added services (VAS) and mobile data.

³¹ Credit Suisse First Boston, op. cit., p. 14.

Table 4.2

AVERAGE MONTHLY REVENUE PER USER, 2001 TO 2005

	2001-02	2002-03	2003-04	2004-05	2005-06F
Monthly ARPU	\$61.44	\$56.73	\$54.46	\$54.01	\$52.25

Note: F indicates forecast values.

Source: Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, Equity Research, p. 38.

Industry commentators expect future growth in revenue to be driven by increased use of data services. The most commonly used data service is SMS, which has grown by 28 percent from 2002-03 to 2003-04 (as noted in chapter 3). This growth is evident in the volume of messages, the contribution to revenue and the customers using these services. For example:

- 5.1 billion messages were sent in Australia during 2003-04 — about 314 SMS per mobile phone user annually. On the Telstra network, 12.6 million SMS messages were sent on New Years Eve 2004 alone, close to double the daily average.
- Optus handles more than 46.8 million SMS messages each week from its customer base of 6.03 million, with mobile data representing 17 per cent of Optus' annual mobile service revenue;³²
- data revenue for Vodafone increased by 29.3 per cent for the year ending 31 March 2004; and
- monthly average non-voice revenue per user for Hutchison grew from \$12 in the first half of 2004 to \$16 in the first half of 2005. Non-SMS revenue grew from \$4 to \$7 in the same period.

Box 4.1 shows the popularity of SMS on Valentine's Day, in particular.

Box 4.1

SMS AND EMAIL THE NEW LOVE LETTERS ON VALENTINE'S DAY

Cupid's arrow is set to strike mobile phone and computer keyboards with more than 6.7 million love-laden SMS and 20 million emails to be sent this Valentine's Day.

According to Telstra's Head of Consumer Marketing, Jenny Young, Valentine's Day ranked third behind Christmas and New Year for SMS traffic.

'Last year we saw 6.3 million SMS and 13 million emails sent on Valentine's Day. The modern virtual love letter is a great way to break the ice. And with picture messaging and MMS, romantics can send pictures and perhaps a Barry White ringtone.

'People of all ages are embracing technology to help connect them to a new partner. More than a quarter of all Internet daters are aged 45 years and over, while half are in the 25 – 34 bracket'

Source: Telstra 2005, 'SMS and email the new love letters on Valentine's Day'.

³² Optus Financial Results 2004.

4.2 Industry gross product

Industry gross product (IGP) is a measure of the economic contribution of a specific industry to the economy. (IGP can also be referred to as industry value added.) The IGP figure describes the market value of goods and services produced by an industry, minus the cost of the inputs used by the industry to produce its goods or services. The figure is calculated as:

$$\begin{aligned} & \textit{Turnover} \\ + & \textit{the increase (or – the decrease) in the value of stocks} \\ + & \textit{government funding for operational costs} \\ - & \textit{(purchases of inputs used to produce the good or service + transfers in + selected expenses)} \\ = & \textbf{Industry Gross Product (IGP)} \end{aligned}$$

The national gross domestic product (GDP) is obtained by summing the gross product of all industries.

It is worth noting that while IGP provides a solid financial measure, it does not reflect quality improvements in mobile telecommunications.

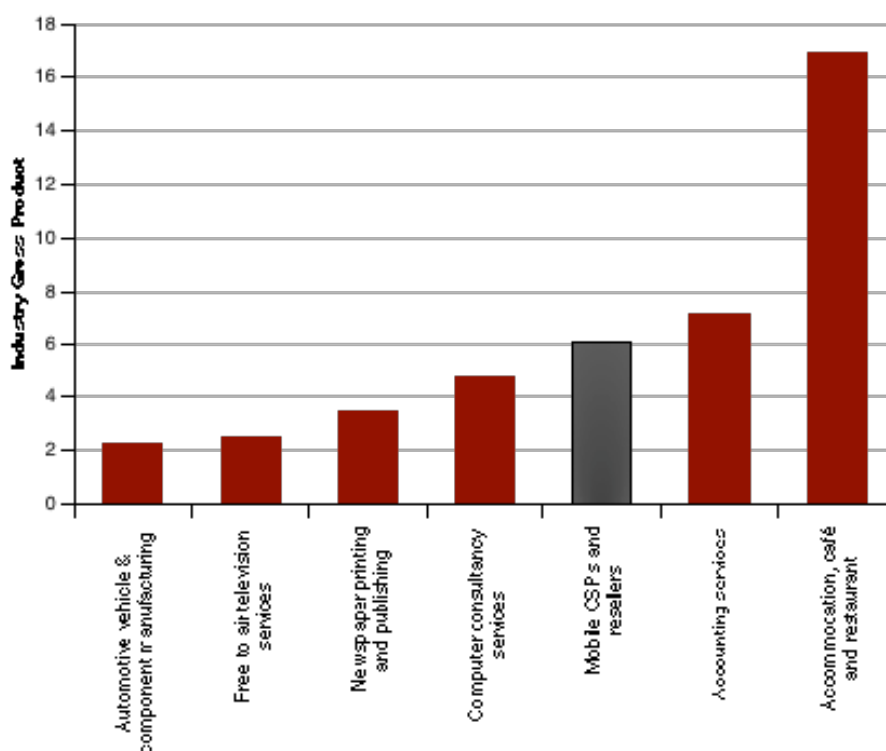
Industry gross product for the CSP sector

In 2004-05, the estimated IGP for the CSP sector (mobile network carriers and resellers) of the Australian mobile telecommunications industry was \$6.1 billion, up from \$5.3 billion in the previous year.³³

To put the significance of the economic contribution of the mobile telecommunications industry into context, figure 4.1 provides estimates of IGP for selected industry sectors. It can be seen that the IGP of mobile CSPs and resellers is higher than that for free to air television services, the newspaper, printing and publishing industry and computer consultancy services sector. Furthermore, it is almost three times as large as IGP of the automotive, vehicle and component manufacturing sector.

³³ Information provided by IBISWorld.

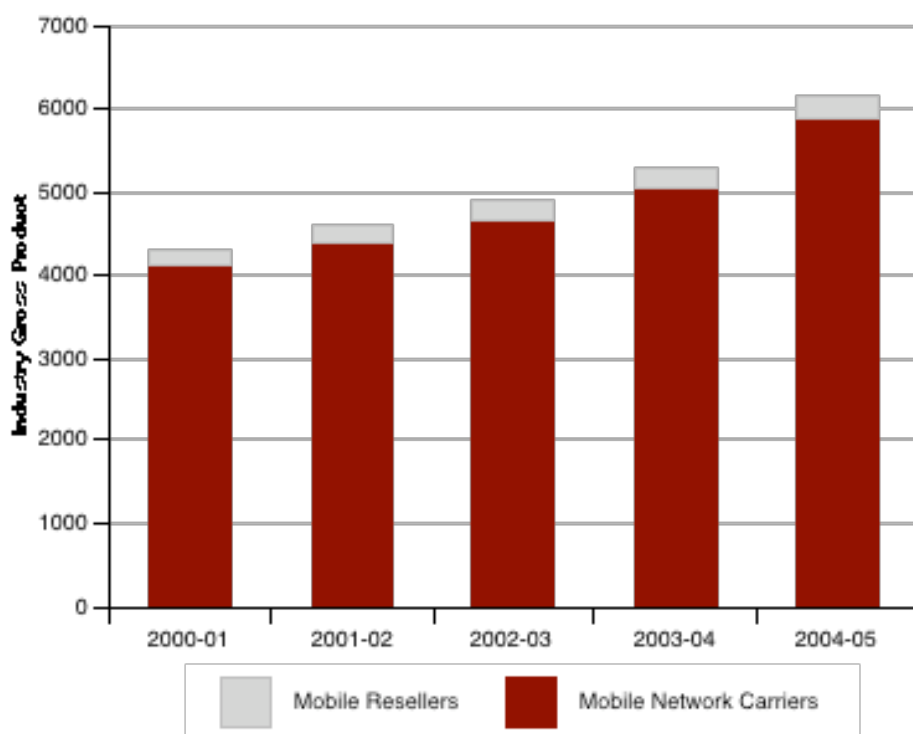
Figure 4.1

INDUSTRY GROSS PRODUCT FOR SELECTED INDUSTRIES, 2004-05 (\$ BILLION)

Source: IBISWorld data.

The mobile CSP sector has experienced strong growth in recent years, with IGP increasing 30 per cent over the period 2000-01 to 2004-05 (see figure 4.2). The mobile network carriers accounted for 96 per cent of the CSP sector IGP in 2004-05, although the contribution of the resellers has increased in each period.

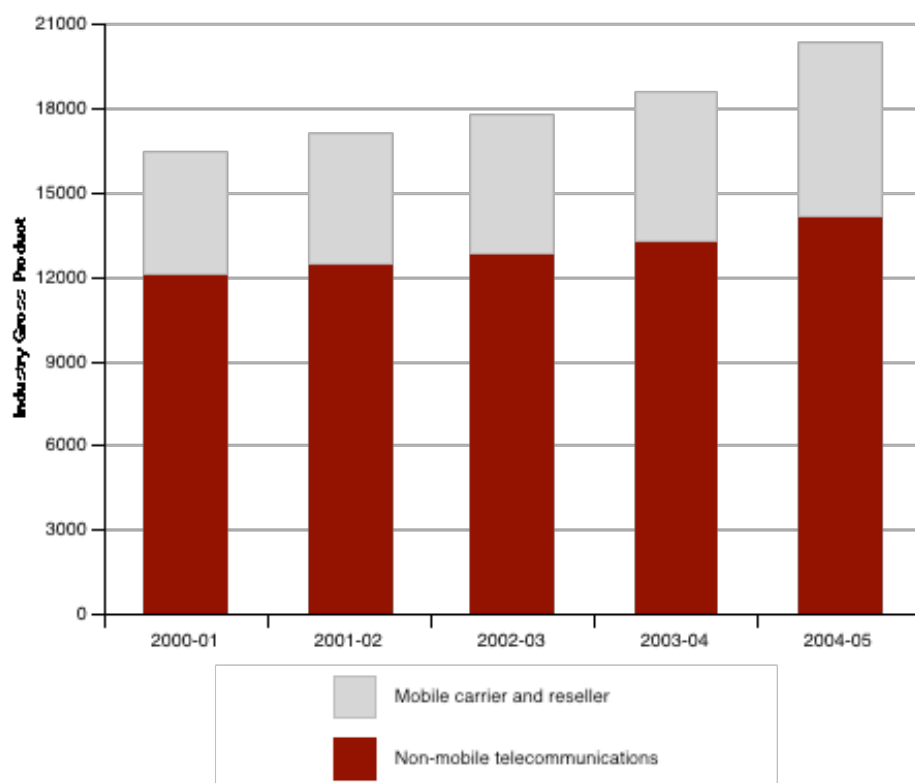
Figure 4.2

INDUSTRY GROSS PRODUCT FOR MOBILE NETWORK CARRIERS AND MOBILE RESELLERS, 2000-01 TO 2004-05 (\$ MILLION)

Source: Information provided by IBISWorld.

The growth in the mobile telecommunications sector is evident by its increasing share of IGP in the broader telecommunications services industry. In 2000-01, mobile CSPs and resellers accounted for 26 per cent of total telecommunications services IGP. In 2004-05, this share had increased to 31 per cent (see figure 4.3).

Figure 4.3

CONTRIBUTION OF MOBILE NETWORK CARRIERS AND RESELLERS TO TELECOMMUNICATIONS SERVICES IGP, 2000-01 TO 2004-05

Source: Information provided by IBISWorld.

Chapter 5

Employment

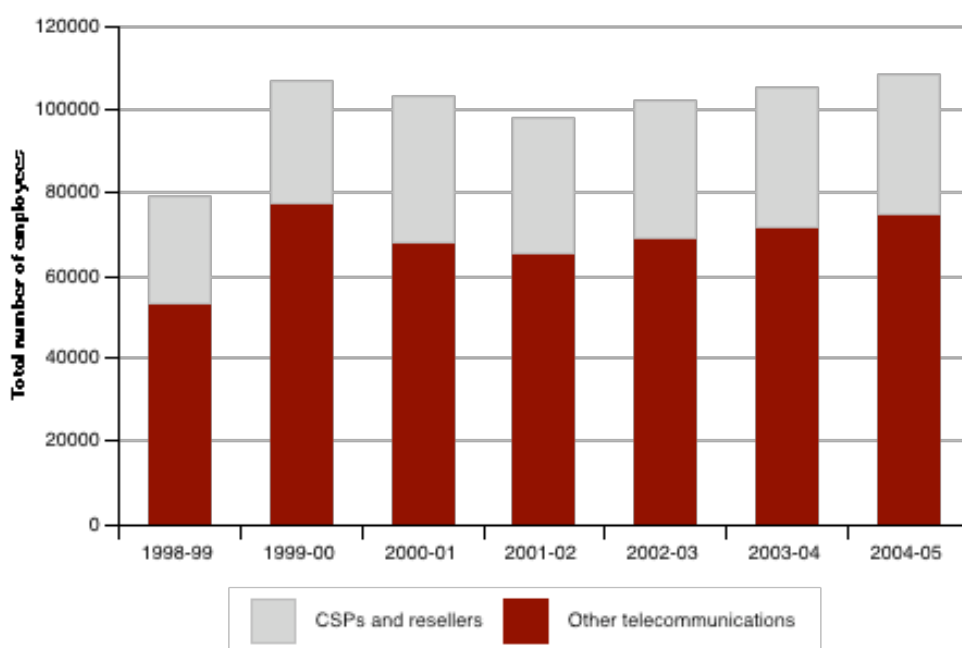
5.1 Trends in employment

It is estimated that the mobile telecommunications sector employed approximately 33 600 of the 108 000 people employed in the telecommunications industry in 2004-05 (see figure 5.1).^{34 35}

Between 1999-00 and 2004-05, employment in the mobile industry increased by 46 per cent, compared to a smaller increase of 38 per cent in the employment of the telecommunications industry as a whole. Since 2001-02, employment in both sectors has increased.

Figure 5.1

TOTAL EMPLOYEES IN TELECOMMUNICATIONS AND MOBILE INDUSTRY, 1998-99 TO 2004-05



Source: Data provided by IBISWorld, see also Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, p. 14.

One implication of the relative employment trends is the increasing importance of the mobile industry as an employer in the telecommunications industry. In 2004-05, the mobile telecommunications industry accounted for 30 per cent of total industry employment, up from 27 per cent in 1999-00.

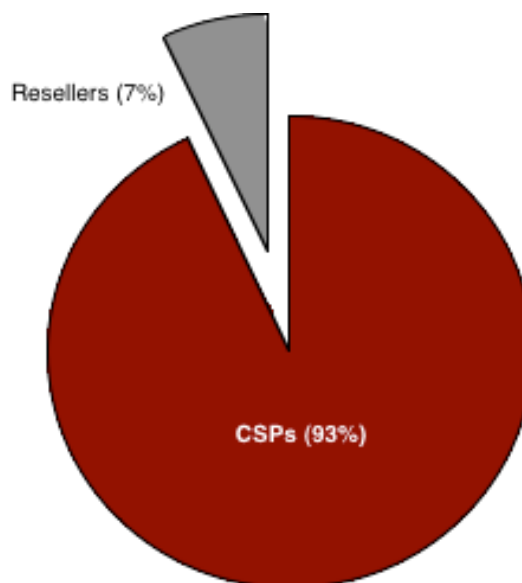
³⁴ Information provided by IBISWorld.

³⁵ For the purposes of this study, employment in the mobile industry includes those employed in the mobile CSP sector and mobile reseller sector. Mobile CSPs and resellers make up nearly 99 per cent of the industry.

Employment growth trends within the mobile telecommunications industry

Within the CSP and reseller sectors of the mobile telecommunications industry, CSPs are by far the most substantial employer, accounting for 93 per cent of employees in 2004-05, (see figure 5.2). Between 1998-99 and 2004-05, the number of full-time equivalent employees increased by 43 per cent in the CSP sector and by 110 per cent in the mobile resellers sector.

Figure 5.2

MOBILE TELECOMMUNICATIONS INDUSTRY EMPLOYMENT BY SECTOR, 2004-05

Sources: Data provided by IBISWorld. See also Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, p. 14.

Employment growth in non-metropolitan areas

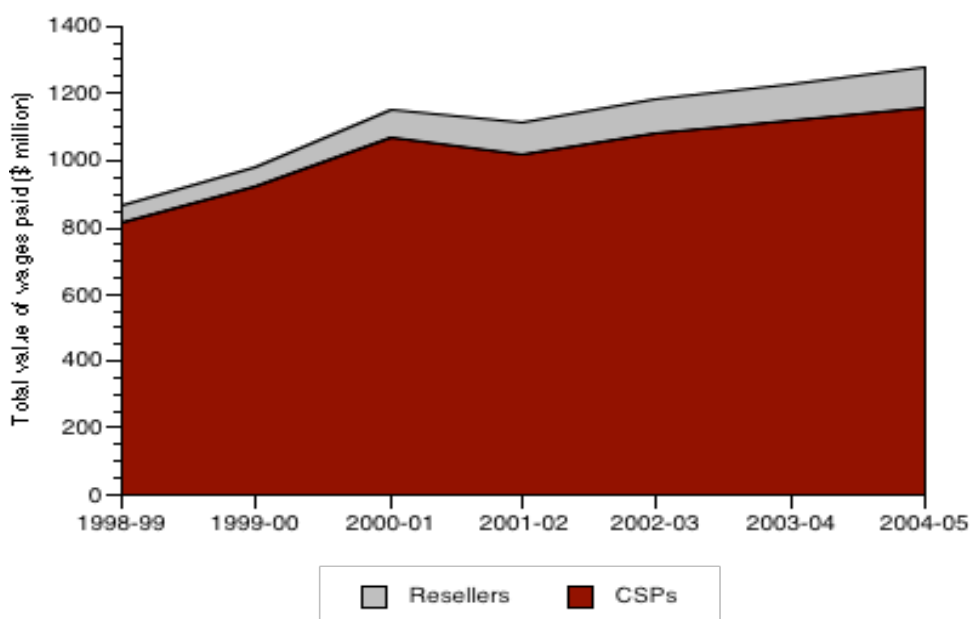
Currently the vast majority of CSP and reseller employees work in metropolitan areas. Telstra was the only mobile network carrier in 2004-05 that had employees working in regional and rural Australia, with approximately 5 to 15 per cent of its employees being located outside of the capital cities.

5.2 Wages paid

The value of wages paid by CSPs and resellers in the mobile industry was approximately \$1.3 billion in 2004-05 (see figure 5.3).³⁶ Wage growth in the industry has been steady in the recent past, with nominal wages in the CSP sector increasing by almost 58 per cent between 1998-99 and 2004-05.

Figure 5.3

MOBILE TELECOMMUNICATIONS VALUE OF WAGES PAID, 1998-99 TO 2004-05



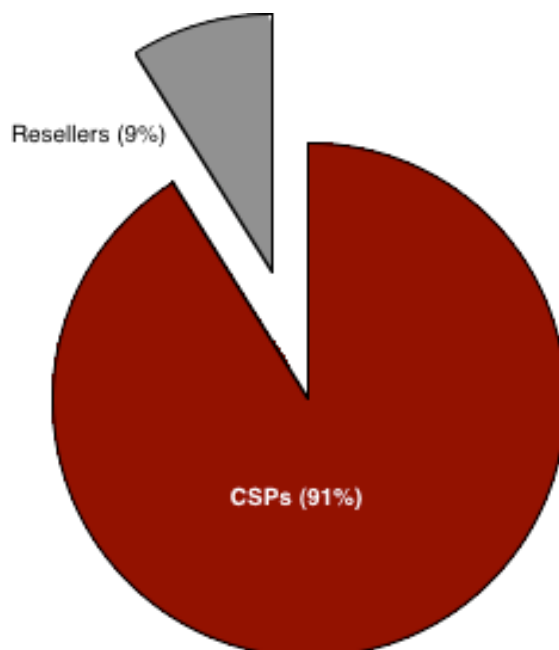
Sources: Data provided by IBISWorld, see also Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, p. 14.

Consistent with its dominance of employment of the mobile industry, the CSP sector accounted for 91 per cent of the value of wages paid in the total mobile telecommunications industry in 2004-05 (see figure 5.4).

³⁶ Aggregate wage estimates include wages paid to full-time equivalent employees, as well as those paid to part-time and casual employees. Thus, the total figure cannot be used to derive an average wage paid in the mobile telecommunications industry.

Figure 5.4

MOBILE TELECOMMUNICATIONS INDUSTRY WAGES PAID BY SECTOR, 2004-05



Sources: Data provided by IBISWorld, see also Credit Suisse First Boston 2005, *Australian Telecommunications 2005*, p. 14.

Chapter 6

Payments to government

6.1 Mobile telecommunications specific payments to government

The mobile telecommunications industry is required to make a number of industry-specific payments to government. In 2004-05, the estimated value of annual payments made by the mobile telecommunications industry to government was \$175.6 million (see table 6.1). This is equivalent to roughly 1.7 per cent of total industry revenue.

Table 6.1

MOBILE TELECOMMUNICATIONS SPECIFIC PAYMENTS TO GOVERNMENT

Payment type	Basis for calculating payment amount	Frequency of payment	Estimated 2004-05 (\$m)
Spectrum licence fee	Amount paid at auction	Annual	\$0.085 ^(a)
Radiocommunications licence fee		Annual	\$59.9
Universal Service Obligation	Eligible telecommunications revenue	Annual	\$65.0 ^(b)
National Relay Service	Eligible telecommunications revenue	Annual	\$2.2
Licence fee for fixed service	Number of fixed point-to-point installations	Annual	\$8.6
Numbering charge	Quantity of mobile telephone numbers	Annual	\$33.6
Annual Carrier Licence Charge	Fixed amount of \$3200 plus a % of the carrier's annual revenue	Annual	\$5.8
Health Research Levy	Radiocommunications licence fee	Annual	\$0.45 ^(c)
TOTAL			\$175.6

Source: Australian Communication and Media Authority 2005.

^(a)This figure represents the amount paid in 2002-03. It has not been possible to update the figure for 2003-04 or 2004-05.

^(b)The Telstra component of this figure was calculated by determining the proportion of mobile revenue to total revenue (23 per cent in 2004-05) and applying this proportion to the total Telstra contribution (\$166.1 million in 2004-05). The same principle applies to the Optus USO contribution.

^(c)This figure represents the amount paid in 2001-02. It has not been possible to update the figure for 2002-03, 2003-04 and 2004-05.

In addition to the industry-specific charges and levies discussed in this section, the mobile telecommunications industry contributes to its effective operation through voluntary and compulsory payments to support various industry associations and self-regulatory schemes, including the National Relay Service, the Australian Communications Industry Forum, AMTA and the Telecommunications Industry Ombudsman. Although these bodies are not government organisations, they form important elements of the industry's self-regulatory regime.

Annual charges to access spectrum

Radiocommunication licences

In 2004-05, \$59.9 million was paid for radiocommunications apparatus licence fees. This is an annual licence fee paid by three carriers (Optus, Telstra and Vodafone) for GSM 900 apparatus licences.³⁷

Annual spectrum licence tax

The Australian Communications and Media Authority (ACMA) recovers a share of the overhead costs of maintaining spectrum through an annual fee or 'spectrum licence tax' on all licensees. In 2002-03, the annual spectrum licence tax paid by the four carriers was approximately \$85 000.³⁸ Spectrum licensing taxes are calculated by adjusting the base amount paid for the spectrum according to its geographical area and the proportion of the population included in that area.

Universal service obligation

Universal service arrangements aim to give residents in relatively sparsely populated areas of Australia access to standard telecommunications services at a price comparable to those available to the rest of the population. This is achieved through a cross-subsidisation arrangement that is funded by a universal service obligation (USO) levy on all telecommunications carriers (fixed and mobile).

In 2004-05, the USO of mobile network carriers was \$65 million. Individual businesses contribute according to their share of eligible telecommunications revenue. For example, if a carrier earned 20 per cent of the total eligible telecommunications revenue, it would pay 20 per cent of the universal service obligation levy. Consistent with the *Telecommunications (Consumer Protection and Service Standards) Amendment Act (No.2) 2000*, the Minister determines the amount of the USO having regard to advice from ACMA.

Since November 2000, mobile telecommunications CSPs have paid the universal service levy to the Universal Service Provider — currently Telstra — to provide standard telecommunications services to people living in rural and remote Australia.

The National Relay Service

The National Relay Service (NRS) allows people who are deaf or have a hearing or speech impairment to use the telephone. The National Relay Service is a national telephone service available to all consumers at no additional cost. People who are deaf, have a hearing or speech impairment, and/or use a telephone teletypewriter (TTY) or a computer with a modem can communicate with anyone in the wider telephone network through the NRS.

³⁷ Information provided by the Australian Communication and Media Authority 2004-05.

³⁸ These arrangements were introduced in July 2000, and each licensee's contribution to the base amount is calculated according to the requirements contained in the *Radiocommunications (Spectrum Licence Tax) Act 1997* and the Radiocommunications (Spectrum Licence Tax) Determination 2000. Information was not available to update this figure for 2003-04 or 2004-05.

Telecommunications carriers are required to contribute to the cost of the NRS. In 2003-04, the total cost of the NRS was \$15.7 million.³⁹ The four mobile carriage service providers paid an estimated \$1.5 million in 2003-04, with an increase to \$2.2 million in 2004-05.

Licence fees for fixed services

Mobile network operators are required to have licences for fixed services issued by the ACMA. The licences authorise licensees to operate radiocommunications devices, such as transmitters and receivers. In effect, they are licences to use specific segments of the radiofrequency spectrum for particular purposes.

In 2004-05, it is estimated that the mobile telecommunications industry paid \$8.6 million in fixed service licence fees.

Numbering charges

Since 1998, the Australian Government has collected \$60 million per year from CSPs holding telephone numbers (fixed and mobile).⁴⁰ These 'numbering charges', are collected by the ACMA in accordance with a statutory 'numbering plan' that it is required to develop.⁴¹

According to the numbering plan, CSPs are liable for all charges relating to the numbers they hold on a pre-determined census date. The census date is determined by the ACMA, which chose 5 April 2005 this year.

In 2004-05, the numbering charges paid by the mobile telecommunications industry amounted to \$33.6 million. This was an increase of \$0.7 million from 2003-04.

Annual carrier licence charge

Each licensed carrier is required to pay the Annual Carrier Licence Charge (ACLC). Revenue generated from this charge is used to operate the various telecommunications regulatory bodies. In 2004-05, the four mobile network carriers paid \$5.8 million in ACLC charges.⁴²

As of July 2004, the licensing fees consist of a \$2200 application fee, a \$1000 annual fee, and a variable percentage of the annual revenue calculated in relation to the cost of maintaining the regulatory regime.

³⁹ Australian Communications Authority 2004, op. cit., p. 164.

⁴⁰ The amount of revenue to be collected is set by the Commonwealth Government through the Federal Budget process.

⁴¹ The annual numbering charge process is administered by the ACMA according to the *Telecommunications Act 1997*, the *Telecommunications (Numbering Charges) Act 1997* and five determinations made by the ACA under these Acts. These determinations set some key parameters for the numbering charge process, for example, the census date and the charge applied to particular numbers. Furthermore, the determinations can be changed from year to year, as necessary. The revenue is collected by the ACMA in accordance with a numbering plan they develop. The development of the numbering plan is required in Part 22 of the *Telecommunications Act 1997*.

⁴² This amount has been calculated assuming 100 per cent is attributable for Vodafone and Hutchison. Optus and Telstra's amounts were calculated based on mobile revenue/total revenue.

Research levy

Since 1996, each radiocommunications apparatus licence fee has included an additional one per cent to fund research into the possible health impacts of mobile phone use. This fee component is part of the government's provision for annual funding of \$1 million for public education activities and the continuation of research into possible health effects from the use of mobile phones and other radiocommunications devices. This initiative (and hence levy) is expected to continue until at least 2006.

In 2001-02, the mobile telecommunications industry accounted for almost 45 per cent of the total value of radiocommunications licence fees, and thus, contributed approximately \$450 000 to the total \$1 million research levy.⁴³

The research sponsored by the levy is conducted through the independent National Health and Medical Research Council (NHMRC) in the Australian Government's Health and Ageing portfolio. Moreover, it is part of an international research effort facilitated by the World Health Organisation (WHO) Research Coordination Committee, which is monitoring a broad ranging series of scientific studies into electromagnetic field exposure.

6.2 Generic taxes paid by the mobile industry

In addition to the industry-specific government charges and levies discussed in section 6.1, mobile telecommunications businesses are subject to the range of government taxes and charges applicable to all businesses operating in Australia, such as company tax, payroll tax and stamp duties (see box 6.1). Like the industry-specific taxes, the quantum of these payments is significant. For example, it is estimated that the industry paid approximately \$74 million (or just less than one per cent of industry revenue) in payroll taxes in 2004-05.⁴⁴

⁴³ Updated figures for 2002-03, 2003-04 and 2004-05 were not available.

⁴⁴ This estimate was calculated by applying a national average of the payroll tax rates in box 6.2 to the total value of wages presented in chapter 5.

Box 6.1

EXAMPLES OF TAXES PAID BY AUSTRALIAN BUSINESSES**Company tax**

Company tax is a Commonwealth tax paid by all companies. The tax is applied at a standard rate — currently 30 per cent — across the country without a tax-free threshold.

Payroll tax

Employers are liable for payroll tax when their total Australian wages paid (plus employer superannuation contributions in most states) exceed a certain level, called the 'exemption threshold'. As shown below, exemption thresholds vary across states and territories.

Payroll tax by States and Territories — 2005-06

	NSW	VIC	Qld	WA	SA	TAS	NT	ACT
Basic rate (%)	6.00	5.25	4.75	5.50	5.50	6.10	6.20	6.85
Exemption threshold (\$ thousand)	600	550	850	750	504	1010	600	1250

Source: NSW Department of State and Regional Development 2005, *Payroll Tax — Australian States, 2005-06*, www.business.nsw.gov.au, accessed 9 July 2005.

Stamp duty

Stamp duty is a tax on written documents ('instruments') and certain transactions, including motor vehicle registrations and transfers, insurance policies, leases, mortgages, hire purchase agreements and transfers of property (such as businesses, real estate or shares).

The rate of stamp duty varies according to the type and value of the transaction involved. Depending on the nature of the transaction, certain concessions and exemptions may be available.

Chapter 7

Industry investment

As discussed in chapter 2, mobile networks in Australia are owned and operated by four mobile network carriers, which invest considerable amounts to maintain and continue the expansion and development of the infrastructure that supports the industry. Likewise, participants in other sectors of the industry contribute notably to keep the industry thriving.

This chapter presents recent levels of investment in the industry by the CSPs, provides examples of specific expenditures by the carriers and other industry members, and discusses spending on research and development.

7.1 Investment in network infrastructure

Since 1997, mobile network carriers have invested an estimated \$10 billion in new networks. They invested the majority of this (\$8 billion) between 1997 and 2002, making additional investments of \$1 billion in both 2003 and 2005.⁴⁵

7.2 Examples of capital expenditure projects

Capital expenditure includes costs for licences, spectrum fees and auctions, and mobile network infrastructure, including base stations, new data services and updates to billing systems. Expenditure tends to be ‘lumpy’ in nature — there are periods of relatively high and relatively low expenditure. Periods where new networks are rolled out, like the recent 3G network rollout, will be associated with high expenditure. When such projects are completed, however, capital expenditure will typically fall.

All mobile network carriers have paid to gain access to spectrum, build and maintain networks, and they are constantly working to upgrade networks and improve the quality and diversity of services provided to customers. This section provides select examples of capital expenditure projects undertaken or planned by the mobile network carriers.

Building 2.5G and 3G networks

*Hutchison’s 3G network*⁴⁶

As noted in chapter 2, the first 3G (WCDMA) network in Australia was launched by Hutchison under the brand ‘3’ in mid April 2003. By the middle of 2003, Hutchison 3G Australia (H3GA) had invested more than \$1 billion, with the total investment expected to be in the order of \$3 billion. Of this, \$1 billion was required to build the network, including the \$196.1 million paid to secure 2.1 gigahertz spectrum licences for 3G.

In addition to the capital investment required to build and operate a mobile telecommunications network, investment is required in associated elements of the industry. For example:

⁴⁵ IBISWorld, 2005, J7122 - *Mobile Telecommunications Carriers in Australia*, p. 20.

⁴⁶ Information provided by Hutchison.

- Hutchison has more than 1100 employees in various capacities dedicated to its '3' service; and
- it has over 200 retail outlets, selling 3 and Orange, in five major capital cities, as well as Canberra and the Gold Coast.

Box 7.1 highlights some of the features of the 3 network.

Box 7.1

FEATURES OF THE 3 NETWORK

- *Business Messaging* provides a secure mobile email service that gives customers remote access to and synchronises with their office applications on their 3 mobile.
- Customers can access office *emails* on their 3 mobile, view latest business appointments and access the corporate directory in real-time. Business Messaging also provides convenient web access to the same applications and to folders and documents on a customers' office LAN.
- With end-to-end encryption using state-of-the-art AES technology and no replication of corporate data outside of the office firewall, Business Messaging can comply with the *data security policies* of a customer's business.
- While in 3's Broadband Zone *email attachments* are downloaded at Mobile Broadband data speeds.
- *Wireless synchronisation* allows users to synchronise their 3 mobile with their office so that they always have one consistent up-to-date view of their email and calendar. Emails deleted on users' mobiles are deleted on their office email systems, and email messages sent from their 3 mobile are recorded in the Sent Items folder at the office.

Source: Information provided by Hutchison.

Optus' GSM network⁴⁷

Optus launched its digital Global Systems for Mobiles (GSM) network in Australia on 18 May 1993. Since that time, Optus has invested over \$2.8 billion to build 4143 base stations that provide 600 000 square kilometres of coverage to 96 per cent of the Australian population.

Optus commenced a roll out of a shared 3G network with Vodafone in the first half of 2005.

Telstra investing to expand CDMA landmass coverage

Telstra has invested in expanding coverage through its 3G network joint venture with Hutchison. This investment includes the coverage of business growth too. At more than twice the geographic size of any GSM network in Australia, Telstra's CDMA network now covers approximately 1.5 million square kilometres and 98.3 per cent of the Australian population.

A further investment is the introduction of the capacity for mobile customers to send and receive SMS to and from residential fixed line services. As content becomes more critical to customers, larger sums are allocated to investments that support managing content to mobile devices such as RIM Blackberry and i-mode alliances.

Box 7.2 illustrates one creative application of the i-mode service.

⁴⁷ Information provided by Optus.

Box 7.2

MOBILE PHONES BECOME A VIRTUAL TOUR GUIDE AT THE MUSEUM OF CONTEMPORARY ART

Visitors to Sydney's Museum of Contemporary Art can now access an audio tour of the Bridget Riley art exhibition by using Telstra's i-mode mobile phone service.

'The service is similar to audio guides available on "wands" in museums and galleries overseas, but has the added advantage of being on a familiar device that allows people to view the art and listen to the commentary in the order they choose — not in pre-set sequence determined by the audio guide'.

The trial also provides a further glimpse of the opportunities presented by mobile services that brings the latest lifestyle content to the consumer's handset.

Source: Source: Telstra 2004, 'Mobile phone becomes virtual tour guide at Museum of Contemporary Art', Media Release, November.

Vodafone

Vodafone has invested over \$2 billion in its network that now covers 93 per cent of the Australian population. Since 1994, the Vodafone has provided GSM mobile telecommunications services to the five mainland Australian capitals and Canberra.

Vodafone has engaged Nokia to build its third generation network for Australia, which will be fully operational by the end of 2005. Vodafone has invested hundreds of millions of dollars over the last two years to develop a globally compatible 3G network. Currently, Vodafone provides 3G services, such as Vodafone 123 and the BlackBerry Enterprise Server (see boxes 7.3 and 7.4).

Box 7.3

CONCIERGE AND INFORMATION SERVICES

Vodafone 123 is a 24/7 concierge and information service available to Vodafone customers. Vodafone customers dial 123 from their mobile phone anywhere in Australia and ask the Vodafone 123 team anything they need to know in a hurry — from street directions, transport timetables, telephone numbers and addresses to quirky trivia facts.

The most common reasons customers dial Vodafone 123 is to ask for sports and lotto results, check the weather forecast, find out the time overseas and obtain contact numbers for the nearest takeaway restaurants.

Vodafone 123 has also been able to help light aircraft navigate their way home, rescue a Santa trapped in a toilet and ring for assistance for quite a few people stuck in elevators.

The service is especially popular on Friday afternoons between 1 p.m. and 3 p.m. (when customers are making weekend plans) and on sport-frenzied Saturdays, with the majority of calls to Vodafone 123 coming from 21 to 35 year olds. Increasingly, calls are being made to Vodafone 123 from younger customers asking for 'cheat' information for computer games.

Source: Information provided by Vodafone.

Box 7.4

VODAFONE LAUNCHES NEW BLACKBERRY SOLUTION FOR AUSTRALIAN BUSINESSES

Vodafone has launched the BlackBerry Enterprise Server™ v4.0 for Australian businesses.

This new service offers organisations enhanced security, simplified deployment, exceptional manageability and expanded corporate data applications. Users will enjoy an enhanced experience, improved ease of use, as well as increased mobility and productivity.

Declan O'Callaghan, business marketing manager for Vodafone Australia, said 'We have seen significant growth in the business sector across all vertical sectors, but especially the growth of small-to-medium enterprises. This new totally wireless BlackBerry solution will spur more and more businesses to consider completely mobilising their workforce'.

Source: Information provided by Vodafone.

Investments to expand within marketplace

Many resellers and hardware producers are investing in programs and services to expand their presence in the current mobile telecommunications market. For example:

- a reseller has increased human resources to operate a regional mobile competence centre providing additional mobile network and services support capabilities for Australia and the Asia Pacific region;
- a hardware producer has invested in additional resources to increase the number of products released on the market by 100 per cent in 2004-05; and
- several resellers have expanded the number of shopfront services across Australia to increase access and presence in the mobile telecommunications market.

7.3 Expenditure on research and development

Another form of investment in the mobile telecommunications market is research and development. Mobile network carriers, resellers and hardware producers all benefit from increases in technology that stem from market and product research. In 2004-05, several market participants invested in research and development, including:

- an investment of over \$20 million in developing core technologies and innovative applications; and
- the development of antennas, which are to be used in future mobile phone products.

In recent years, Telstra has made significant investments in research and development. Box 7.5 highlights one such research project.

Box 7.5

PLANNING FOR GROWING TECHNOLOGIES

Telstra has awarded a \$950 000 contract to the University of Adelaide's Traffic Research Centre (TRC) Mathematical Modelling unit to develop analysis tools and techniques applicable to network infrastructure that will cater for next generation telephony, broadband data and mobile services.

A major focus of the research will be ensuring the availability of the required tools and techniques to efficiently plan and monitor the network infrastructure that will allow it to respond to the predicted growth in traffic levels. Specific issues are ensuring that Telstra's telecommunications infrastructure is ready for the next generation of services that will be offered by broadband Internet and mobility. The performance must be of the highest quality, robust and scalable into the future.

The research will be carried out over the next three years. The contract is the continuation of an 18-year partnership and secures TRC's services to provide technical expertise as it relates to traffic analysis and engineering.

TRC Mathematical Modelling is a centre within the University of Adelaide devoted to solving industrial problems involving modelling, measurement and performance. Its historical focus has been in the area of telecommunications, with recent expansion into solving resource optimisation problems in manufacturing.

Source: Telstra Media Release 2004, 'University of Adelaide helps Telstra plan for growing technologies', May, Reference Number: 149 / 2004.

Chapter 8

Industry innovation

8.1 Introduction

The mobile telecommunications industry is known for embracing innovation, as illustrated by the rapid speed in which the industry moved from the now obsolete AMPS network to the most recent 3G generation of mobile phones. In the past few years, the industry has made significant advances in linking mobile phones to other forms of technology, particularly media and information technologies.

This chapter focuses primarily on this link between mobile telephony and other technologies, commonly known as ‘convergence’. It considers advances in convergence, challenges to this type of innovation and the impact of the new technology on the way people live and do business.

8.2 Convergence

Convergence is the process whereby communications technologies blend together to facilitate wider, more integrated methods for the distribution of information.⁴⁸ Convergence has transformed the mobile phone from a basic voice communication piece to a machine facilitating the interaction of three major sectors: telecommunications, media and information technology.⁴⁹

Convergence in content

A key aspect of convergence is that it enables users to access a wide variety of content on their mobile phones. For example, some mobile phones now allow users to:

- have immediate access to news highlights, sport, stock prices (media);
- send and receive emails, including synchronisation with business software (information technology); and
- hold video conference calls (telecommunications).

Each of these links is explored in greater detail below.

Media and broadcasting convergence

Several mobile network carriers and hardware producers are undertaking convergence between mobile phones and media and broadcasting technologies on a large scale. A number of specific examples are discussed below.

- Telstra’s i-mode provides customers with many sources of content, including:
 - the capacity to bid on E-bay;
 - local news from the Australian Broadcasting Corporation;

⁴⁸ T. Barr 2000, *Newmedia.com.au: the changing face of Australia’s media and communications*, Allen & Unwin, New South Wales.

⁴⁹ M/Cyclopedia of New Media 2004, *Mobile Phones-Convergence*, <http://wiki.media-culture.org.au>, accessed 13 July 2005.

- horoscopes;
 - music and news from radio station Triple-J; and
 - international news from CNN.
- Vodafone Live! provides an innovative means to access music. It allows customers to download, listen to and watch music videos of more than 500 000 songs. Users can also use Vodafone Live! to view live performances from their mobile handsets.
- One mobile phone hardware producer has launched an interactive mobile television platform that will create further opportunities to expand convergence between mobile handsets and new media technologies.
- The media industry, which is available on most handsets and through all mobile network carriers, also initiates content convergence with, for example:
 - voting on television programs (for example, *Big Brother* and *Australian Idol*);
 - mobile marketing messages and product competitions using SMS; and
 - ringtone downloads.
- Content on the 3 network is provided by specialist providers who develop content specifically for delivery on 3G, including:
 - 24/7 access to looped streaming of ABC television's *Rage*;
 - live streaming, such as Surf Cam and *Big Brother*;
 - local and regular news and sports video highlights on demand;
 - restaurant, bar and movie reviews/times search;
 - RSVP dating;
 - stock prices;
 - horoscopes;
 - chat sites;
 - Kodak Easyshare – photos; and
 - PIN-protected Adult content.
- Vodafone has sponsored the first mobile soap opera, *Random Place*, which customers can receive via their mobile phones. From 2 May 2005, subscribers can receive two 'mobisodes' per day, five days per week.
- One mobile telecommunications reseller has entered an agreement with America's Cup Management for the 2007 event in Spain. Content convergence with digital cameras on handsets will enable customers to watch the entire event on their mobile phones through video re-broadcasting.

Internet convergence

The increasing demand for content in wireless data access and data transfer capabilities has triggered extensive convergence between mobile phone handsets and the Internet and information technology.

For example, Telstra has invested in a network to provide access to wireless data services through WiFi access points, known as 'Telstra Hotspots'. Partnerships with McDonalds restaurants, Starbucks Coffee and Qantas allow eligible customers to access localised Internet or broadband services at these wireless 'hotspot' locations.

Similarly, 3's Net connect card provides wireless Internet at broadband speed whenever a customer is in a 3 zone. This allows customers to send and receive emails to their laptop or other mobile device in real time.

The introduction of BlackBerry handsets, on the other hand, allows customers to access real-time email services and data transfer capabilities from their mobile phone handset regardless of where they are. Mobile email has been identified as an important development in the mobile telecommunications industry, and it shows the potential that convergence can offer customers, who are already showing a strong demand for this capability.⁵⁰

Telecommunications convergence

There also has been some recent convergence among different modes of telecommunications. For example, convergence is expanding between mobile phones and:

- fixed lines — Telstra has introduced services enabling fixed line telephones to send or receive SMS. As a means of expanding this service, it also has introduced SMS-enabled cordless telephones;
- payphones — there has been further expansion in the capability of payphones to support sending SMS to mobile phones. Now more than 80 per cent of payphones can be used to send a SMS to a mobile phone when customers have run out of credit, have a flat battery or have had their mobile phones stolen; and
- desktop computers — in May 2005, Telstra launched the *Telstra Online Text Buddy*, which enables customers to compose and send SMS from their desktops.

There also have been continuing improvements in the convergence between mobile phone handsets and digital camera technology. The vast majority of handset producers have introduced models that have a digital camera included. Although this technology has been present in the market for some time, the quality of the content has rapidly improved. Moreover, this technology has allowed mobile phone carriers to introduce services enabling customers to make video conference calls from their mobile phone handsets.

⁵⁰ Deloitte 2005, *Technology, Media and Telecommunications Trends: Predictions, 2005. A Focus on the Mobile and Wireless Sector*, p. 8.

Challenges of convergence

Convergence presents challenges for industry participants and regulators in ensuring that the new models for service delivery meet community standards and expectations for responsibility and accountability.

AMTA and the Australian Direct Marketing Association (ADMA), representing content providers, have worked together — and with other bodies and regulators — for more than two years to develop an appropriate and practical framework for the regulation of mobile content.

The two government agencies with responsibility for regulating the technologies when delivered via their ‘traditional’ platforms (the Internet via a computer, broadcasting via television, or radio) were the ACA and the Australian Broadcasting Authority (ABA). These agencies, whose merger in July 2005 into the Australian Communications and Media Authority (ACMA) reflects the converged service environment, worked together to review existing regulation and consider how appropriate consumer protection might be afforded under the new service delivery models.

Consumer protection for converged technology is provided through:

- an updated Internet Industry Association (IIA) Code, registered in May 2005, that now includes appropriate reference to mobile content;
- the Telecommunications Service Provider (Mobile Premium Services) Determination 2005 (No.1). The Determination, which is managed by the ACMA, introduces high-level obligations that require carriage service providers and content service providers to introduce consumer protection measures when offering premium mobile services; and
- a Mobile Premium Services Industry Scheme, developed by the industry, that will give practical effect to the determination and require a number of requirements are met, including:
 - appropriate assessment of premium mobile content (consistent with the Office of Film and Literature Classification Guidelines, with which the community is familiar);
 - take-down notice procedures to ensure that inappropriate material is removed in a timely manner;
 - robust access controls and age verification processes; and
 - safety measures to protect young people from any illegal activities by other chat room users.

This scheme also requires an independent escalated complaints handling body.

The Commonwealth Department of Communications, Information Technology and the Arts (DCITA) is conducting a convergent communication devices review. This will further consider mobile content issues, exploring long-term options for the appropriate regulation of converging technology devices.

8.3 Pricing and service innovation

Beyond convergence, mobile phone carriers and hardware producers continue to introduce new services and plan for innovation in the future. A key area of innovation in service delivery has been mobile service pricing mechanisms — specifically capped plans and prepaid services.

Capped plans provide customers with low-cost alternatives to mobile telecommunications. Prepaid services, on the other hand, allow customers to better manage their mobile phone expenditure. The increasing preference for prepaid services suggests that customers value choice and flexibility. Moreover, future innovation will allow prepaid customers to access a full range of services now only available to post-paid customers.

8.4 Changing the way we live and do business

Innovations in mobile telecommunications have generated enormous changes to the way we live and do business. Access to convergence content through 2.5G and 3G networks and the availability of prepaid and capped plans have made everyday tasks easier and more enjoyable for individuals and businesses. Moreover, these innovations have had positive impacts on the environment and community more broadly.

Convergence in every day life

Convergence content services can simplify and augment everyday life in a number of ways. For example, they allow individuals to:

- access traffic reports on their mobile phones and thereby avoid traffic congestion;
- receive sporting event score updates and watch live sporting events on their mobile phones;
- use video and mobile phone services to improve personal safety. For example, Surelabs has developed a security system that streams video footage to a user's mobile phone on the 3 network when an intruder has been detected;
- obtain information on cinema showing times and book tickets, and find the location of restaurants and make reservations;
- get timetables for trains, buses and airplanes to ensure they get to their destinations on time;
- use video facilities to see their children in childcare; and
- access music, games and ringtones add some fun to the day.

Boxes 8.1 and 8.2 describe how convergence has provided new opportunities for travel and dating.

Box 8.1

OPTUS ZOO KEEPS LONELY PLANET AT YOUR FINGERTIPS

Optus Mobile has announced a content partnership with Lonely Planet Publications, the world's premier independent travel media company, enabling Optus customers to download Lonely Planet CityPicks travel guides to their java-enabled mobile phones via the Optus Zoo mobile content portal.

Lonely Planet CityPicks are destination guides for more than 40 cities across Australia, Asia, Europe, USA and Africa. Featuring at least 50 recommendations per city, CityPicks take the hard work out of tracking down the best restaurants, bars, nightlife, shops and hotels by keeping them immediately available on your handset.

The guides are a great solution for time-poor business travellers who want to quickly find a restaurant for dinner or pick up a souvenir between meetings. The service enables users to customise their phones to give them the information they want at their fingertips — it is as easy as searching for a phone number on one's mobile phone.

As most people take their mobile with them while travelling, CityPicks guides for the mainland Australian capital cities are likely to be popular with interstate business travellers and people on short city stopovers.

Source: Optus 2005, 'Optus Zoo keeps Lonely Planet at your fingertips', 2 March.

Box 8.2

VIDEO DATING VIA MOBILE

A partnership between mobile carrier 3 and online dating site RSVP.com.au has allowed RSVP members to search for mates while on the road — and send them welcome videos and pictures at the same time.

RSVP also has struck partnerships with Telstra and Optus to link its site with their respective content services.

This feature has mainly been a novelty for users to video phone each other since the service launched two years ago. However, linking the ability to send photos to the RSVP site has added a new dimension to mobile dating. Users of RSVP on 3 can now search online profiles, send pictures and videos online or to other mobile users, search profiles and interact with the site in the same way as if they were sitting at their computer. More than 10 000 of 3's 500 000 customers have signed up for the RSVP on 3 service since its launch in February 2004.

Source: Sydney Morning Herald April 2005, 'Video dating come to the mobile'.

Convergence in business

Business users also have embraced convergence technology as a way to operate more efficiently. Some examples of how convergence benefits business activity include:

- wireless Internet and email access allowing people to work with more flexibility — Telstra Mobile Broadband provides fast wireless Internet access across the country on the CDMA network. It is particularly useful for customers who spend a lot of time in rural areas or offshore. For example, South Australian and Western Australian fisherman are able to use Telstra Mobile Broadband to complete work more efficiently out at sea;

- the RSP Group, a recruitment firm, brings employers and candidates face-to-face using video calling on the 3G network. This technology is ideal in assessing a candidate's personality or a client's culture. A client hiring interstate can, for example, do the first round of interviews by phone rather than having to travel to the meeting;⁵¹
- a location-based service system — 'Loc3' has recently been introduced as a tool for real estate agents. The service allows agents to use their 3G mobile phones to download sales history information, maps and pictures for a property. Real estate agents have experienced a 25 per cent increase in efficiency as a result of this convergence technology;⁵² and
- business promotion — businesses can use convergence technologies to hold competitions among customers, either through videos streamed to customers' mobile phones, applications sent by SMS or by customers participating through mobile Internet access.

Box 8.3 describes how one loan market company benefited from convergence technologies.

Box 8.3

MORTGAGE CHOICE SAVES ON MOBILE COSTS WITH 3

As a leader in the fiercely competitive residential loan market, Mortgage Choice constantly looks for innovative ways to improve the customer experience and streamline business processes.

For Matthew Holland, the owner of seven Mortgage Choice franchises across Sydney, this meant cutting loan approval times, increasing productivity and reducing telecommunications costs.

'Arming our staff with mobile phones and high-speed wireless Internet access to provide on-the-spot loan approvals and superior service at the client interface has given us an edge over the competition that has increased sales. Coupled with the significant cost savings, joining 3 has been an extremely profitable investment,' he said.

Before 3, Mr Holland found it increasingly difficult to manage his businesses and meet the demands of home loan borrowers. With more than 20 staff on different mobile plans, Mr Holland was receiving bills from numerous carriers.

Loan approvals were highly time consuming. Mr Holland's staff had to manually complete the loan forms at the applicant's premises, return to the office to manually enter the data, and then wait for approval.

'Our research showed that 3's \$99 Hot Cap would save more than \$2000 in national voice calls per month,' Mr Holland said. 'We picked the LG U8120s on the 3 network so we could take advantage of the multimedia features to take photographs at promotional events and video call each other on 3 when out of the office.'

Source: Information provided by Hutchison.

Increasing community wellbeing

Innovations in mobile telecommunications also have helped to increase social equity by, for example, expanding access to disadvantaged groups, encouraging workforce participation and by using revenues for charitable purposes.

⁵¹ Mobile Carriers Forum 2005, *Third Generation Mobile Networks in Australia, an Information Booklet*, p. 6.

⁵² Ibid, p. 7.

Expanded access to mobile telecommunications services

The increased affordability of mobile telephony — particularly through low-cost and capped plans — allows more people to use mobile telecommunications services. This means that people from a wide array of socio-economic backgrounds can benefit from the connectivity provided by these services. For example, a majority of parents can now monitor their children's safety and behaviour through voice and video communications with mobile phones.

Similarly, the extended mobile access in rural and regional Australia, including on highways, provides a communications link to people who live in these areas and a means of safety for people who experience problems on highways in remote areas.

Expansions of mobile telecommunication services to disabled populations also have contributed to increased social equity. Research recently commissioned by Telstra has found that there is currently a range of off-the-shelf telecommunications equipment that enables disabled people to access mobile telecommunications services. However, the research also found that there is room for improvement in these products, suggesting this as a potential area for future mobile telecommunications innovations.

Increased workforce participation

For individuals, it has long been recognised that whether or not someone has a job is the key influence on his or her economic circumstances and wellbeing more generally. Advances in mobile telecommunications have enabled some people who otherwise would not be participating in the workforce to seek employment. A trial conducted by the Department of Employment and Workplace Relations in 2004, for example, found that providing mobile phones to job seekers:

- increased job referrals by 40 per cent; and
- increased job placements by 30 per cent.⁵³

Similarly, mobile email access on BlackBerry handsets can increase workforce participation by offering more flexible working arrangements to potential workers. Mobile email not only allows employees to work from home, but also it makes it easier for part-time workers to stay in contact when not in the office. Finally, the capability to hold videoconferences with one's children may encourage some parents (particularly mothers) to return to the workforce.

Community programs

Another way in which the mobile telecommunications industry is working to improve social equity is by directing some revenue from mobile phone carrier services to programs that benefit the wider community.

The Australian mobile telephone industry, for example, joined the massive community response to come to the aid of the victims of 2004 tsunami. The Australian-based mobile telecommunications companies donated generously at the local level and as part of a worldwide response from their corporate headquarters. The Australian industry helped to set up the 'Australia Unites' initiative, which allowed, for the first time, mobile phone users to send SMS messages to donate money to the appeal.

⁵³ Department of Employment and Workplace Relations 2004, *Mobile Phone Trial: Final Report*, p. 3.

Australian mobile phone operators involved in the 'Australia Unites' initiative raised nearly \$2 million for the tsunami appeal through World Vision. Mobile customers sent more than 250 000 SMS messages to donate money. Donations were added to their next mobile phone bills or deducted from their prepaid mobile account balances. The cost to send the SMS was waived. Some Australian mobile telephone companies waived all costs for 1800 and 1300 calls during the tsunami crisis for aid agencies. Others covered the costs of aid agencies' communications costs during the disaster, ensuring a higher proportion of every dollar reaches those in need.

Furthermore, the Australian mobile telephone industry set up employee donation schemes to help staff make salary deductions, which are being matched dollar-for-dollar by some companies.

Finally, mobile telecommunications companies have donated generously on behalf of all their employees worldwide to give long-term support for such things as reconstruction of schools and the provision of educational equipment over the next five years.

Environmental impacts

In 1999, environmental concerns surrounding the use and disposal of mobile telecommunications products were addressed by the mobile telecommunications industry. Now in its fifth year of full operation, the Mobile Phone Industry Recycling Program (MPIRP) collects mobile phone parts for recycling and reuse. Manufacturers and carriers contribute to the scheme to ensure that there is sufficient funding for all potential recycling, as well as educational campaigns to increase community awareness.

Since 1999, more than 300 tonnes of mobile phone handsets, batteries and accessories have been collected for recycling. This equates to 500 000 handsets and 1.15 million batteries, almost half of which contained cadmium (an element that is recognised to produce toxic effects on humans).⁵⁴

⁵⁴ AMTA 2005, *Mobile Phone Recycling Update*, www.amta.org.au/aoi.asp?ID+Recycling, accessed on 12 August 2005.

*Appendix A***Project working group members**

The members of the AMTA working group overseeing this project are listed in table A.1.

Table A.1

PROJECT WORKING GROUP MEMBERS

Name	Position	Representing
Graham Chalker	Chief Executive Officer	AMTA
Brian Currie	Regulatory Affairs Manager	Hutchison
Michelle Curtis	Manager Government & Community Relations	Optus
Stephanie Huf	General Manager, Public Affairs	Ericsson
Louise Ingram	Corporate Communications Manager	Nokia
Paul Johnston	Senior Policy Analyst	Vodafone
Randal Markey	Manager, Communications	AMTA
Fiona McAlister	Research Officer	AMTA
John Mills	Manager — Investor Communications	Telstra
Matt Pearce	Regulatory and Policy Manager	Virgin Mobile
Ross Young ^(a)	Policy Analyst	Vodafone

^(a) Ross Young was the Vodafone representative on the working group from July 2005.

*Appendix B***Request for information from industry**

Part of this project involved the collection of information from businesses in various sectors of the mobile telecommunications industry. The purpose of the information collection was to supplement publicly available information. In particular, the information collection process was designed to gather industry input on the size and nature of activities that occur in the various sectors of the industry, with a focus on innovations and future directions.

The process of collecting information from industry involved sending a survey to thirty industry participants with a request that they complete and return the survey to The Allen Consulting Group. The survey requested information on the following topics:

- firm contact details and business activities;
- employment;
- industry capital expenditure; and
- future directions and issues.

In the course of the project, thirteen completed surveys were returned.

Appendix C

Organisations involved with the mobile telecommunications industry in Australia

Table C.1 lists those government departments, industry organisations and consumer/user groups involved with the Australian mobile telecommunications industry.

Table C.1

ORGANISATIONS INVOLVED IN THE MOBILE TELECOMMUNICATIONS INDUSTRY

Organisation	Activities and role
Government departments	
The Australian Communications and Media Authority (ACMA)	The Australian Communications and Media Authority (ACMA) is responsible for regulating broadcasting, radiocommunications, telecommunications and online content. Its responsibilities include promoting industry self-regulation and competition in telecommunications, while protecting consumers and other users. ACMA was established under the <i>Australian Communications & Media Authority Act 2005</i> , and exercises powers under the <i>Telecommunications Act 1997</i> and the <i>Trade Practices Amendment (Telecommunications) Act 1997</i> , and other related legislation.
The Department of Communications, Information, Technology and the Arts (DCITA)	The Department provides policy advice and program support to the Australian Government on arts, information technology, communications and sport portfolio issues. The <i>Minister for Communications, Information, Technology and the Arts</i> is responsible for the development of Australia's communications, information technology and cultural industries.
The Australian Competition and Consumer Commission (ACCC)	The ACCC's Telecommunications Group has prime responsibility for administering the Commission's functions for competition and economic regulation of telecommunications and forms part of both the ACCC's Regulatory Affairs Division (in terms of its regulatory pricing and access work) and its Compliance Division (in terms of its competition enforcement work).
The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)	ARPANSA, as part of the Health and Ageing Portfolio, is a Federal Government agency charged with responsibility for protecting the health and safety of people and the environment from the harmful effects of ionising and non-ionising radiation (including radio frequency emissions).

Industry organisations	
Telecommunication Industry Ombudsman (TIO)	Established in 1993 by the Australian Federal Government, the TIO is funded by industry but is independent of industry, government and consumer organisations. The TIO is authorised to investigate complaints about the provision or supply of telephone or Internet services. The role and powers of the TIO are included in the <i>Telecommunications (Consumer Protection and Service Standards) Act 1999</i> .
Australian Communications Industry Forum (ACIF)	ACIF is an industry-owned, resourced and operated company established by the telecommunications industry in 1997 to implement and manage communication self-regulation within Australia. ACIF's role is to develop and administer technical and operating arrangements that promote both the long-term interests of end-users and the efficiency and international competitiveness of the Australian communications industry. This primarily involves: <ul style="list-style-type: none"> • developing Standards and Codes to support competition and protect consumers; • driving widespread compliance; and • facilitating/coordinating the cooperative resolution of strategic and operational industry issues.
Information Technology & Telecommunications Industry Training Advisory Body (IT&TITAB)	IT&TITAB represents Australia's communication & information technology industries at a national advisory level for Vocational Education & Training (VET).
Telephone Information Services Standards Council (TISSC)	TISSC is an independent regulatory body that sets standards for the message content and advertising of any Australian telecommunication service with the prefix 190, in the form of a Code of Practice. Service providers of 190 numbers must abide by the TISSC's Code of Practice.
Consumer/user groups	
Australian Telecommunication Users Group Ltd (ATUG)	Formed in 1981, ATUG is a not-for-profit membership-based organisation of Australian telecommunications users. It focuses on delivering practical services for its members, leveraging their experience to identify new policies that can improve the telecommunications regime. ATUG also helps members share their experiences so that all ATUG members get better value for their telecommunications dollar.
The Small Enterprise Telecommunications Centre Ltd (SETEL)	SETEL is a national consumer association advancing the telecommunications and e-commerce interests of Australian small business. The Commonwealth of Australia supports representation of small business consumers in relation to telecommunications and e-commerce issues in national forums by SETEL through the 'Grants to Fund Telecommunications Consumer Representation' program of the DCITA.

**Consumers
Telecommunications
Network (CTN)**

Telecommunications Network (CTN) is a national coalition of consumer and community organisations that represents community interests in the national policy arena on telecommunications issues. CTN is an important voice promoting better access, quality of service and affordability of telecommunications services for residential consumers. CTN's members include national and state organisations representing consumers from non-English speaking backgrounds, deaf consumers, Indigenous people, low-income consumers, people with disabilities, pensioners and superannuants, rural and remote consumers, women and consumers in general.

Source: Information provided by AMTA.

Appendix D

Infrastructure supporting mobile telecommunications

A substantial amount of infrastructure is required to enable a mobile network to operate.⁵⁵ Mobile phones use a series of locally based radio networks or cells. The term 'cell' refers to the geographical area covered by the network base station, which contains the radio equipment serving the cell. Areas with high mobile phone use tend to have small cells. In Australia, mobile phones transmit radio signals at frequencies of about 800 megahertz for CDMA and 900 and 1800 megahertz for GSM.

Each base station operates in conjunction with adjacent base stations. Base stations must therefore be located so that each cell in the network can function efficiently. This ensures minimum network congestion and good signal quality.

In Australia, mobile carriers typically own the base stations. The more base stations a particular carrier has in a particular area the smaller the cells, meaning the power and energy levels of each are lower. In large and remote areas such as Western Australia, it is not practical to establish a system of base stations that will cover the entire state. Telecommunications satellites are used to perform the functions of base stations in those areas.

Base stations consist of antennas that transmit and receive signals from mobile phones and are mounted on towers, tall buildings and other urban structures, such as light poles. The length of antennas depends on the size of the cells: where cells are small, antennas do not need to be very high and can be installed on building roofs or small poles. In low usage areas, however, the cells are larger and the antennas are mounted on taller masts and towers.

After receiving the signal from a mobile phone, the base station transmits the signals to a 'switching centre', i.e. a telephone exchange for mobile phones. The switching centre connects (or 'switches') the call to another mobile phone or a conventional telephone line.

Antennas are located on telecommunications towers. A mobile phone tower is often a self-supporting structure that can either act as an antenna itself or support one or more antennas on its structure, including microwave dishes. The antennas are often located at or near the top of the tower mounted in groups on a triangular or rectangular frame. Each group of antennas services a separate cell.

Mobile phones usually transmit their signals to the closest mobile phone tower, from where the towers transmit radio signals that travel in straight lines. Therefore, the higher the tower is situated, the greater the range at which the signal can be received.

⁵⁵ The material in this appendix comes from the Department of Communications, Information Technology and the Arts (DCITA), Homepage, <http://www.dcita.gov.au>, *About mobile phone networks*.

Co-location refers to the sharing of one carrier's tower or pole by another. This may also include the sharing of equipment shelters if space is limited but does not include the antennas and cabling for macro-cell facilities. The vast majority of telecommunications towers and poles in metropolitan Australia have at least one co-locating carrier and many have two or three additional carriers.