AMTA

**Australian
Mobile Telecommunications
Association**

The Allen Consulting Group

Australian Mobile Telecommunications Industry

Economic Significance

The Allen Consulting Group

Acknowledgments

The Allen Consulting Group would like to thank the members of the mobile telecommunications industry who contributed to this report.

A ten member Working Group of industry representatives provided guidance and feedback on the project. This included reviewing draft documents, providing guidance on industry issues and helping to obtain information from public and private sources. 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 industry issues as well as up-to-date information.

Preface

This report was commissioned by the Australian Mobile Telecommunications Association (AMTA) and completed by The Allen Consulting Group. This is the second 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.

Contents

Executive summary

Australia's mobile telecommunications industry has been a strong performer over the last ten years and recent innovations provide a platform for continued strong performance. Today, the Australian mobile telecommunications industry has an estimated 16 million subscribers, in over 70 per cent of households, used by nearly 80 per cent of the Australian population. Mobile telecommunications have become a part of every-day 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. 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.

The mobile telecommunications industry

The mobile telecommunications industry is made up of three major sectors.

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 comprises a number of large global firms as well as many smaller firms, particularly providing end-user equipment.

Carriage service providers (CSPs) are suppliers of telecommunication services to the public using carrier network infrastructure. In 2001-02, there were more than a dozen CSPs operating in Australia.[1] This included four mobile network carriers, Telstra, Optus, Vodafone and Hutchison, who own and operate six mobile networks as well as resellers and Virtual Mobile Network Operators (VMNOs). The CSP sector is the largest individual sector in the mobile telecommunications industry.

Retailers are the third 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 retail outlets such as speciality outlets that may be branded by a CSP or 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* and *program developers* are growing in importance. Content providers develop and provide information and entertainment on mobile phones. Program developers extend applications and develop new applications for mobile phones, through extending the functionality of mobile devices and/or integrating data. The emergence of these sectors is linked to the third generation (3G) network and as such, the importance of these sectors to the mobile industry will grow alongside the growth in Australia's 3G network.

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[1] Australian Communications Authority (ACA), 2002, *Telecommunications Performance Report 2001-02*, Melbourne, p. 161.

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 2002-03 was $4.8 billion.*[2,3]

  – Industry Gross Product (IGP) is a measure of the economic contribution of a specific industry to the economy or value added.

  – The contribution of the mobile telecommunications sector to the economy was larger than the free to air television services industry and also larger than the newspaper printing and publishing industry. The contribution of the mobile telecommunications sector was almost one third of the entire accommodation, cafes and restaurants industry.

- *The industry contributes substantially to government revenues through charges and levies and through the full range of Commonwealth and State generic industry taxes and charges.*

  – It is estimated that on-going industry specific payments made by the mobile telecommunications industry to government are in the order of two per cent of revenue per year or $178.2 million in 2003-04.

  – The industry has contributed almost $2.9 billion to government through payments made to access spectrum.

  – The industry contributes to effective industry operation through payments, some voluntary and some compulsory, that support various industry associations and schemes, for example the Telecommunications Industry Ombudsman and the National Relay Service.

- *Employment in the mobile telecommunications industry is growing.*

  – Over 34 500 people worked in the industry (on a full-time, part-time or casual basis) in 2002-03. Over the period 1997-98 to 2002-03, employment in the mobile telecommunications industry increased by 48 per cent, compared to an increase of around 30 per cent in the telecommunications industry as a whole.

  – In 2002-03, the mobile telecommunications industry paid around $1.2 billion in wages.

  – Mobile telecommunications accounted for over one third of total telecommunications employment in 2002-03. By comparison, in 1996-97, mobile telecommunication employees accounted for just under one quarter of total telecommunications employment.

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[2] The estimates of IGP are derived from a combination of sources. Mobile network carrier IGP is taken from IBISWorld publication J7122 Mobile Telecommunications Carriers in Australia. Mobile resellers IGP has been derived from IBISWorld publication J7123 Telecommunications Resellers in Australia and ABN AMRO publication Telecom Networks- Australia: Industry Overview.

[3] The figures presented are in nominal terms. Given the downward trend in prices, it is likely that the real growth in IGP would be higher than that indicated in the nominal figure.

- *Capital expenditure by the industry has been substantial.*

  – In 2003-04, the industry continued its capital expenditures to support new networks and expansions and upgrades to existing networks. This is in addition to regular operating expenditures.

  – Since 1997, capital expenditure on new networks has exceeded $8 billion.[4] These investments underpin expansions to mobile network coverage that make mobile services available to more people in more places as well as supporting the development of innovative services.

- *Revenue in the mobile telecommunications industry exceeds $8 billion annually:*

  – An estimate of mobile telecommunications industry revenue for 2003-04 was $8.8 billion;[5]

  – In 2002-03, mobile revenue represented 28 per cent of total telecommunications revenue.

Expectations of continuing industry development

The measures of economic significance of the mobile telecommunications industry identify that the industry has experienced strong growth in its first ten years. 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 growth rate in mobile subscriber numbers from 2003 to 2004 was above 10 per cent. Peaks in subscriber growth appear to be associated with the introduction of new networks. The 3G network commenced in 2003. The full impact of this new network on growth rates 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 64 per cent in 2001-02 to be 72 per cent in 2002-03 and is forecast to be around 80 per cent in 2004.[6] Currently, Australia is ranked equal 20th in terms of per capita mobiles. Although it may seem unlikely, a penetration rate above 100 per cent is possible and has been achieved in a number of countries. This comes about when mobile phone customers make use of more than one SIM card and/or mobile phone handset, allowing them to have different mobile numbers for business and personal use. Another factor likely to drive mobile penetration rates over 100 per cent is the uptake of mobile technologies by business and government, for example demand for mobile devices that wirelessly enable different parts of their enterprises and make use of devices for asset tracking.[7]

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[4] IBISWorld publication J7122 Mobile Telecommunications Carriers in Australia. p. 17.

[5] Information provided via industry survey and publicly available information.

[6] ABN-AMRO, November 2004, Telecommunication Services: Australian Telecommunications 2004, p.29

[7] Merrill Lynch Global Wireless Matrix, First Quarter 2004, publication date 7th July 2004. p 16, as provided by Telstra.

Pre-paid customers are driving the continued growth in subscriber numbers (see figure E.1). In June 2003, around 40 per cent of all mobile phone services were pre-paid. Prepaid services offer an inexpensive way to enter the mobile market without the credit-worthiness checks associated with many mobile contracts, and allow customers to better manage their mobile phone expenditure. The increasing preference for prepaid services suggests that customers value choice and flexibility.

Figure E.1

PREPAID VERSUS POST-PAID SUBSCRIBERS
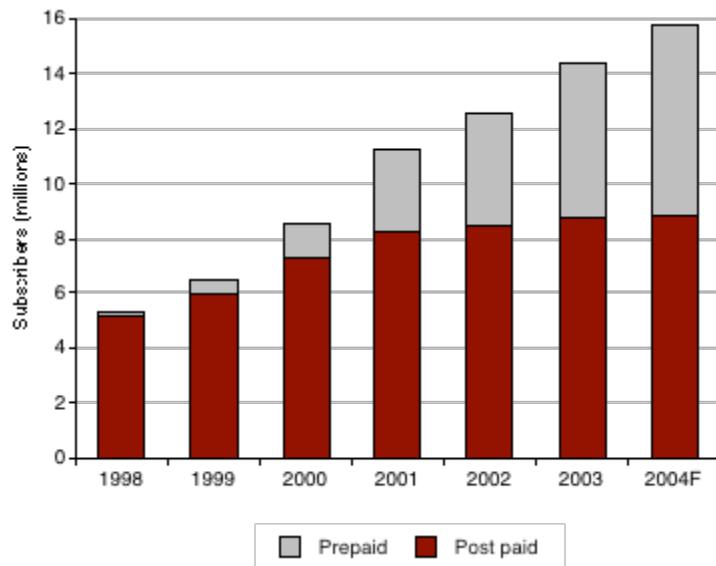
Note: F indicates forecasted values.
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

Short message service (SMS) is another major source of growth in the mobile telecommunication industry. In 1998 data revenue accounted for only one per cent of total carrier revenue. In 2002-03, SMS services accounted for an average of 9 per cent of revenue received by mobile service providers.[8] In 2002-03, an estimated 3.95 billion messages (or an average of 294 messages per mobile phone subscriber) were sent, reflecting an increase of 44 per cent since the previous year (see figure E.2).[9] Huge peaks in SMS use are experienced at significant times in the community, for example Christmas and New Year. Many industry innovations are being developed around the use of SMS.

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[8]   Australian Communications Authority, 2003, *Telecommunications Performance Report 2002-03*, Melbourne, p.89.
[9]   Australian Communications Authority, 2003, *Telecommunications Performance Report 2002-03*, Melbourne, p.89.

Figure E.2

NUMBER OF SHORT MESSAGE SERVICES (SMS)
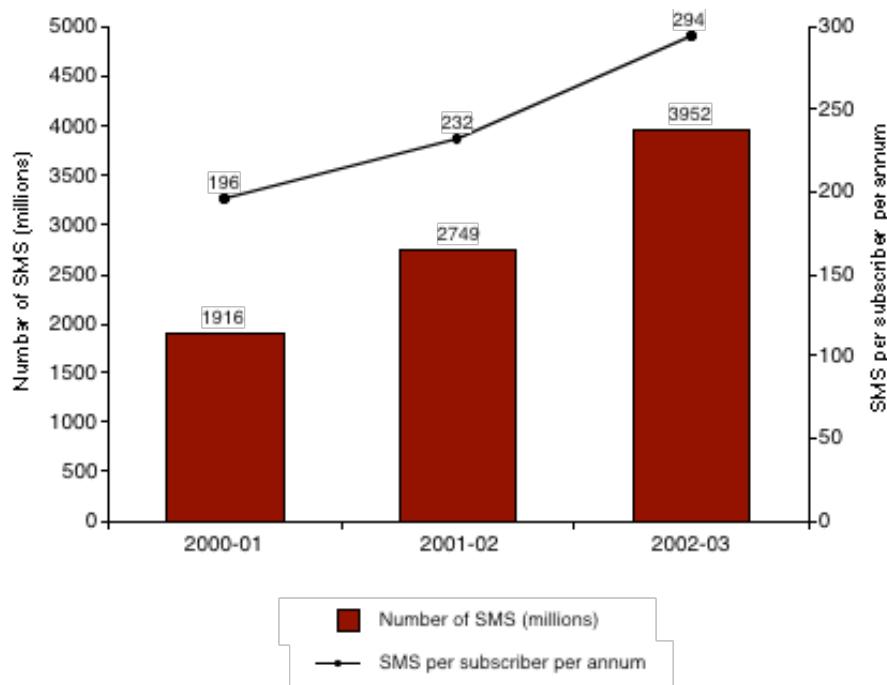
Source: Australian Communications Authority, 2003, *Telecommunications Performance Report 2002-03*, Melbourne, p.89.

On-going innovation

The convergence of the internet and mobile communications technologies introduce new ways of delivering content and applications to the end user. Advances in both telecommunications network capabilities and the functionality of end-user devices, has started to provide internet and television-like services that were previously only available in a fixed line environment. The three critical and inter-related features of technological innovations in mobile telecommunications are:

- improving speed of data networks, that supports the efficient delivery of larger file sizes;

- increased capability of devices. Handsets have evolved from devices that support voice, SMS and MMS to devices that integrate these functions with capability to send and receive music, sound, video and information; and

- availability of information that can be integrated for example, linking of visual data with geographic reference points, such as a location-based mobile data service for the real estate industry.

Innovations in mobile telephony are impacting on the way individuals go about their day-to-day activities, helping to improve the quality of life, and the way businesses operate, helping to improve productivity.

Innovations provide more options to manage business and personal activities. For example, being able to book airline and movie tickets via SMS, having automated systems to alert parents when their child is not attending school, or being able to access data away from the office at high speeds. Taking personal applications of wireless technologies recent developments allow customising, chat and discussion, news and information, and entertainment. For businesses, mobile telecommunications offers increasing flexibility, for example, using mobile telecommunications to schedule field service staff, such as people servicing building lifts.

The mobile telecommunications industry anticipates that quizzes, images, chat, multimedia content, and interactive applications will continue to be taken up by customers during 2004.

Social contribution

Data on measures such as IGP, employment, and payments to government demonstrate the economic contribution of the mobile telecommunications industry to the telecommunications industry as a whole and 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.

For many people, mobile telecommunications is more than a tool to make voice calls: 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 to reach people on the move and for them to be able to maintain contact with other people.

For individuals, mobile phones can provide some security and safety benefits. There are many cases where people have been able to use a mobile phone to convey their need for help. A recent innovation is a home alarm system that will send an alert to a mobile phone if the alarm is triggered.[10]

New innovations in mobile telephony are assisting people in various ways in their every day lives. For example, for the first time in 2003, New South Wales senior students were able to receive their HSC results via a text message on their mobile phone. This was up to four days before the HSC results arrived by mail.[11]

These types of innovations for individuals mean that the role and thus importance of mobile telephones in our society is growing. To further understand the nature and extent of the impact of mobile telecommunications on Australian society, AMTA has produced a discussion paper that examines areas for future research opportunities.

Future reports

This is the second AMTA sponsored report to examine the economic significance of the mobile telecommunications industry. Ideally, this type of report would be produced regularly and become a key source of information on the industry. AMTA welcomes comments on the methodology used and on the material presented in the report.

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[10] Telstra Media Release, 'Home alarms that alert your Mobile'.

[11] Sydney morning Herald, 23 November 2003, 'Textbook to text msg: HSC results by mobile', http://www.smh.com.au/articles/2003/11/22/1069027379010.html

Glossary

ABS	Australian Bureau of Statistics
ACA	Australian Communications 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
IMEI	International Mobile Equipment Identifier or Identity
IP	Internet Protocol
IVM	Interactive Voice Messaging
IVR	Interactive Voice Response
LAN	Local Area Network
LBS	Location Based Services
MCF	Mobile Carriers Forum
MMS	Multimedia Message Service
MPIRP	Mobile Phone Industry Recycling Program
NHMRC	National Health and Medical Research Council
OECD	Organisation for Economic Co-operation and Development
SMS	Short Message Service
TDMA	Time Division Multiple Access
UMTS	Universal Mobile Telecommunications System (or Service)
USO	Universal Service Obligation
VAS	Value Added Services
VMNO	Virtual Mobile 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
4G	Fourth Generation Technology

Chapter 1

Introduction

1.1   The project

Mobile telecommunications have become a part of every-day life across our society: in working and home life and across age groups. The Australian industry is now more than ten years old. The industry continues to contribute to the economy, recording growth in the last year in a number of key measures for example, revenue and employment. The innovative drive that has given impetus to this growth remains a feature of the industry with continuing advances in both mobile telecommunications products and services.

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 second year the report has been produced. Like the 2003 report, this year's report brings together a broad range of information available from many public sources, and builds on it by including information gained from a survey of selected AMTA members.

The report brings together detailed information on the participants in the industry, industry growth and examples of mobile phones enhancing the way people do business and manage their daily lives. It also presents measures of the economic significance and contribution of the entire industry to the Australian economy.

The report is a valuable tool for 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 July 2004. It involved:

- desk-based research to gather relevant national and international information on the mobile telecommunications industry;

- surveying selected AMTA member firms in various sectors of the mobile telecommunications industry;

- the collection, collation and analysis of data from selected firms; and

- analysis and presentation of publicly available and survey data in this report.

This is the second AMTA sponsored report to examine the economic significance of the mobile telecommunications industry. Ideally, this type of report would be produced regularly and become a key source of information on the industry. AMTA and The Allen Consulting Group would welcome comments on the methodology used and on 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.

A description of the various network technologies is in box 2.1.

Figure 2.1

MOBILE TELECOMMUNICATIONS TIMELINE, AUSTRALIA
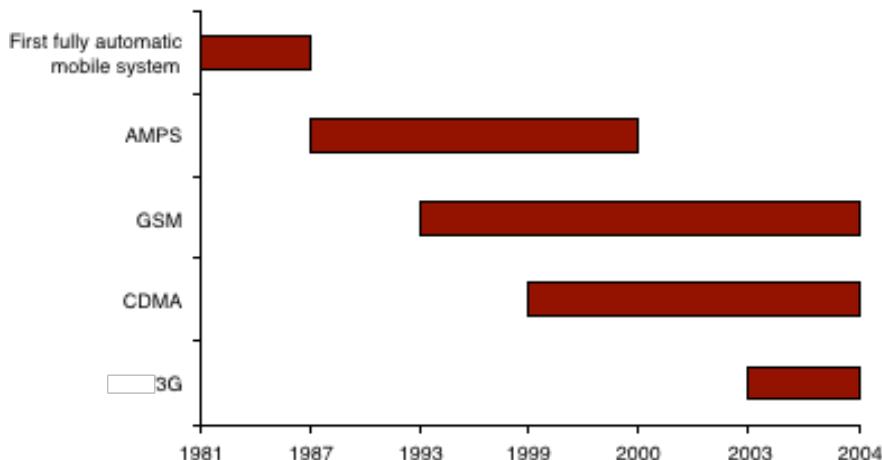
Source: The Allen Consulting Group

In 1987 the first analogue, or Analogue Mobile Phone Service (AMPS), cellular network was launched and hand-held phones could be purchased. These phones were big and bulky and sold for over $4000. 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 closed 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, which 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. 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 drop-out completely. See analogue signal.

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

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 154Kbps.

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

4th Generation Technology (4G)

Advancement on the 3G network where all wireless standards interoperate. 4G is expected to deliver fast broadband quality internet services directly to the mobile handset.

In 1993, the new second generation (2G) digital global system for mobile communications (GSM) networks was launched and growth in customer numbers 'skyrocketed' (see chapter 3). Three carriers, Telstra, Optus and Vodafone launched GSM services in that year. These networks remain in operation today and in 2001-02 it was estimated that 93 per cent of mobile telecommunications services were provided on GSM networks.[12] These carriers have also implemented General Packet Radio Service (GPRS) ('2.5G') networks that deliver 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. Telstra and Hutchison operate CDMA networks. Telstra's CDMA system completely replaced its analogue AMPS system, in both city and country.

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[12] Australian Communications Authority, *Telecommunications Performance Report 2001-02*, p. 157.

In 2003, Hutchison introduced a new network: the 3G network, under the brand name 3, utilising the Wideband CDMA standard. 3 enables live, person-to-person video calling and the delivery of advanced multi-media services to the mobile handset at high speeds. The other three carriers have indicated the following:

- Optus has announced a Heads of Agreement with Vodafone to build and operate a joint national 3G radio network infrastructure across Australia (see box 2.2). Optus is providing '3G like' services to the existing 2.5G network. For example, the launch of Optus Zoo which enables live TV streaming. Vodafone is also currently providing '3G like' services over its 2.5G network, such as Vodafone live!

- Telstra is deploying its CDMA2000-1xRTT version of 3G services nationally. Telstra and Hutchison have entered into a Heads of Agreement to establish an enterprise that will own and operate the existing 3G network and fund future network development (see box 2.2); and

Box 2.2

3G NETWORK SHARING AGREEMENTS

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 service and to compete for customer business. The arrangement is conditional upon the necessary regulatory approvals.

Telstra and Hutchison

On August 4th 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, in four instalments, starting 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 and Perth. Telstra and Hutchison expect to significantly increase the size of the network over the next three years, expanding into Canberra and other regional centres. Decisions on network development will be made and funded jointly. The joint enterprise will utilise 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.

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

2.2   Australian mobile telecommunications: current industry structure

The mobile telecommunications industry is one of the fastest growing telecommunications markets and includes all calls from mobile phones to either fixed or other mobile phones. The industry involves a number of government, industry and consumer organizations (see Appendix C). The current industry structure, involves a number of sectors (see figure 2.2) that in combination provide the services that make mobile telecommunications available to final customers.

There are a number of individual businesses that operate in multiple sectors. This is particularly true for the CSPs. However, there are also some businesses that operate exclusively in one sector, particularly in the hardware sector (see section 2.3).

Figure 2.2

THE MOBILE TELECOMMUNICATIONS INDUSTRY
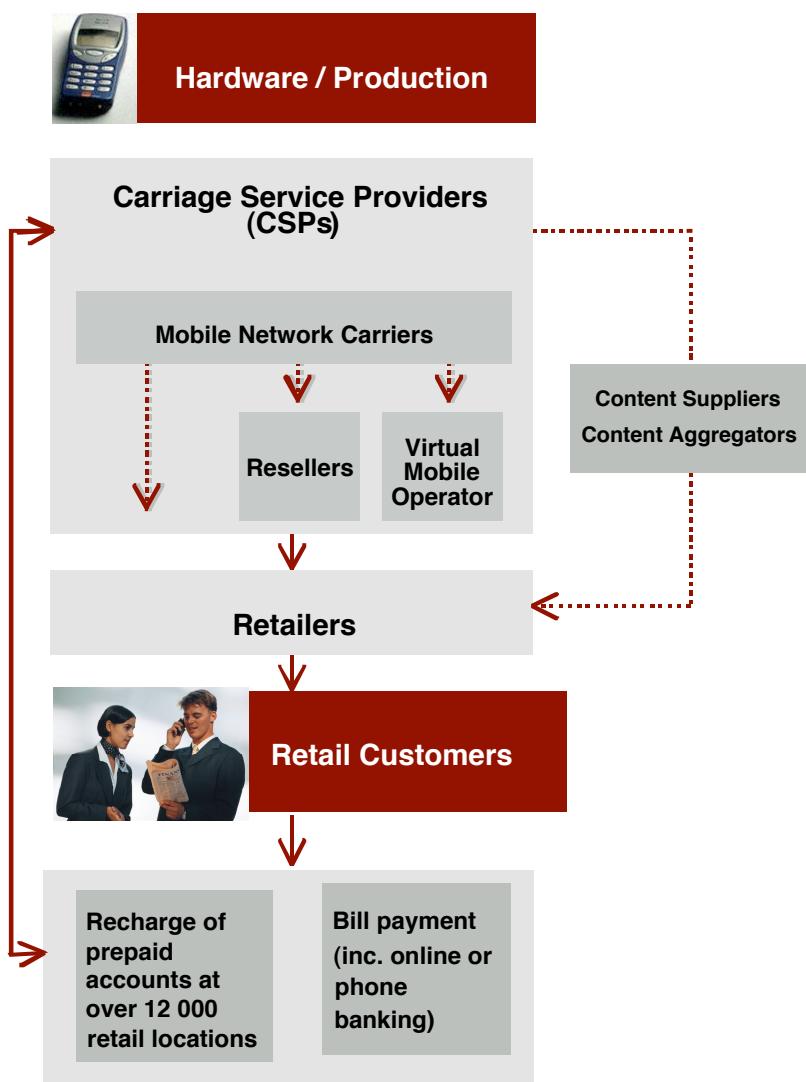
Source: The Allen Consulting Group

2.3   Mobile telecommunications industry sectors described

This section describes 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* that supports the volume of mobile telecommunications services and the *end-users' hardware* which is owned and operated by individuals to use mobile telecommunications services.

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. In addition, there is a range of support activities involved in the design, construction and installation of the infrastructure. The mobile network operators own the infrastructure, but tend to outsource its maintenance.

In Australia the major providers of infrastructure hardware products are Ericsson, Nortel and Nokia. Box 2.3 describes how the various components of infrastructure operate to provide mobile telecommunications services.

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

End-user hardware

The end-user component of the hardware sector includes the equipment owned and operated by individuals to provide access to mobile telecommunications services. This includes handsets, motor vehicle hands-free kits, earpieces and mobile phone cases. Over the 12-month period up to June 2004, more than 7 million handsets were sold in Australia: approximately 90 per cent were GSM and 10 per cent were CDMA. In the first quarter of 2004, more than 3.5 million handsets had been sold.[13] New mobile handsets can now include the capability to both send and receive data and send and receive pictures and video clips. 3G handsets can send and receive video calls/messages, as well as allowing the user to video call any PC in the world that has a web cam and broadband connection.

Handsets are purchased by new subscribers, but also by existing subscribers when they update or replace old handsets.

The nature of the activities undertaken in Australia by players in the end-user hardware market include:

- importing hardware exclusively for the purpose of distribution of that hardware;

- importing hardware, developing infrastructure networks, investing in R&D;

- end-to-end mobile solutions across mobile networks, mobile applications, microwave radio and handsets; and

- service and repair of mobile phones.

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[13]   Industry statistics provided by AMTA, http://www.amta.org.au/

In Australia the majority of end-user hardware products are imported and supplied by, for example, Motorola, Nokia, Panasonic, Samsung, Siemens, Sony Ericsson and many others etc. The development of mobile telecommunication services, in addition to voice services, has been associated with on-going innovations in handsets. This includes Australia's first one megapixel camera phone that allows customers to take print quality digital images with their mobile phone. Also, Vodafone has branded mobile handsets available from a range of handset manufacturers including Motorola, Nokia, Panasonic, Sharp and Sony Ericsson that are required to access the full spectrum of services offered by their Vodafone live! service.

Box 2.3

INFRASTRUCTURE SUPPORTING MOBILE TELECOMMUNICATIONS

To make or receive a call on a mobile phone requires the use of a substantial amount of infrastructure. 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 a frequencies in the ranges 825~845 MHz (CDMA) and 935~960 MHz (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. More and more, telecommunications satellites are used to perform the functions of base stations in those areas.

Base stations consist of antennae that transmit and receive signals from mobile phones and are mounted on towers or tall buildings. 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 antennae are often located at or near the top of the tower mounted in groups on a triangular or rectangular frame. Each group of antennae 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 sited, the greater the range at which the signal can be received.

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 Australian have at least one co-locating carrier and many have two or three additional carriers. However due to the separate evolution of 4 competitive networks, it is not always possible for carriers to co-locate. Since the Mobile Carriers Forum (MCF) came into operation, there has been a marked increase in co-location of facilities and a decrease in community opposition to mobile phone infrastructure (resulting from increased awareness and education of base stations). Australian Communication Authority (ACA) legislation also encourages telecommunications carriers to share infrastructure where it is technically feasible and economically rational.

Source: Department of Communications, Information Technology and the Arts (DCITA), 1998, About mobile phone networks, cited 13/08/2003, www.dcita.gov.au/article/0,,0_1-2_1-4_12884,00.html

Figure 2.3

THE NETWORK REQUIRED TO MAKE A MOBILE CALL
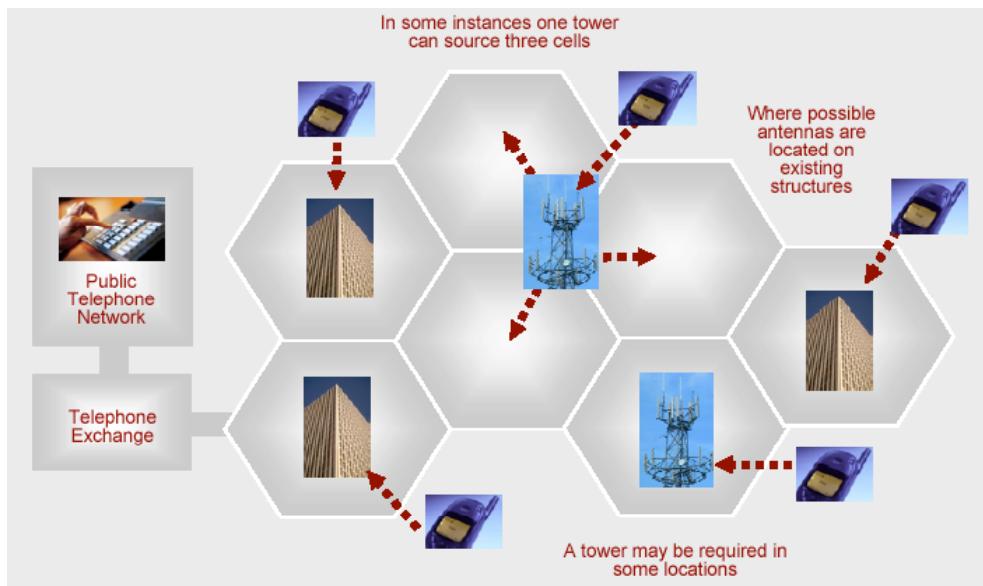
Source: Mobile Carriers Forum 'How does a mobile phone network operate?'

Carriage service providers

CSPs are defined as suppliers of telecommunications services to the public using carrier network infrastructure. In 2002 there were 13 CSPs operating in Australia. This includes four mobile network carriers Telstra, Optus, Vodafone and Hutchison who operate their own mobile networks and nine resellers. The mobile network carriers are the largest individual sector in the mobile telecommunications industry.

Mobile network carriers

Nationally, four mobile network carriers, Telstra, Optus, Vodafone and Hutchison, own and operate six mobile networks (see description of the infrastructure hardware sector above). They also hold licences to use spectrum space needed for telecommunications services and offer a variety of mobile services to customers utilising 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 space. The extent of a spectrum allocation can be pictured as a cube. The geographic area is represented by the floor of the cube, 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), PCS 2000 Spectrum Licence Allocation 1.8 GHz Bands, November 1999, Applicant Information Package, cited 15/08/2003, http://auction.aca.gov.au/ auction_results/pcs_2000_results_page/aip_pcs2000.asp

Telstra provides mobile service via both GSM and CDMA networks. Optus and Vodafone supply mobile services via GSM networks. Optus also resells Telstra CDMA services. Hutchison provides mobile services via both a CDMA network and the 3G Wideband CDMA (WCDMA) standards. Table 2.1 provides an overview of the mobile carriers in Australia.

As described above, a recent and significant change in the carriage service providers sector is agreements to share 3G network infrastructure (see box 2.2):

- Optus and Vodafone have agreed to share 3G network sites and radio infrastructure across Australia;[14] and

- Telstra and Hutchison have agreed to establish a 50/50 owned enterprise that will own and operate the existing 3G network and fund future network development.

In addition to their large infrastructure investment and significant investment in spectrum licences, CSPs are directly involved in the retail sector of the industry.

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[14] Optus and Vodafone Media Release 2004, *Optus and Vodafone Australia announce plans to roll out shared 3G network,* 26 August 2004.

Table 2.1

OVERVIEW OF MOBILE CARRIERS IN AUSTRALIA

Mobile Carrier	Mobile Standard	Launch	Coverage
Telstra			
	GSM/GSM1800	1993	Available in most areas of population, (more than 95 per cent of population).
	CDMA	2000	Available in most areas of population, (more than 98 per cent of population).
	3G (1xRTT)	2003	Launch coverage of greater metropolitan areas of: Melbourne, Sydney, Brisbane, Gold Coast, Canberra, Perth, Adelaide Hobart, Gippsland and Launceston.
			Substantial progress has been made to extend coverage to be available to 98 per cent of population by the end of 2004.
	3G higher speed	2005	See 'Shared Infrastructure' below.
Optus			
	GSM/GSM1800	1993	Available to 95 per cent of Australia's population.
	3G	2005	See 'Shared Infrastructure' below.
Vodafone			
	GSM/GSM1800	1993	Available in most areas of population, (93 per cent of population)
	3G	2005	See 'Shared Infrastructure' below.
Hutchison			
	CDMA	2000	Melbourne and Sydney and roaming on Telstra CDMA network outside of Hutchison's licence area.
	3G (WCDMA)	2003	Melbourne and Sydney, Adelaide, Brisbane and Perth and roaming outside of the Hutchison licence areas provided by Vodafone GSM network.
Shared Infrastructure			
Optus/Vodafone			
	3G	2005	Sydney, Melbourne
Telstra/Hutchison			
	3G (WCDMA)	2005	Melbourne, Sydney, Brisbane

Note: Satellite services have been available since the mid-1990s. They are currently offered to customers by Optus, Telstra and Vodafone and provide 100 per cent coverage. Source: BIS Shrapnel, 2001, *Telecommunications infrastructure in Australia 2001*, the Australian Competition and Consumer Commission (ACCC), Melbourne, p.110-111; Australian Competition and Consumer Commission (ACCC), Mobile Services Review 2003: An ACCC Discussion Paper, April 2003; and information provided by industry.

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).[15]

Figure 2.4

MOBILE TELECOMMUNICATIONS COVERAGE IN AUSTRALIA, 2002
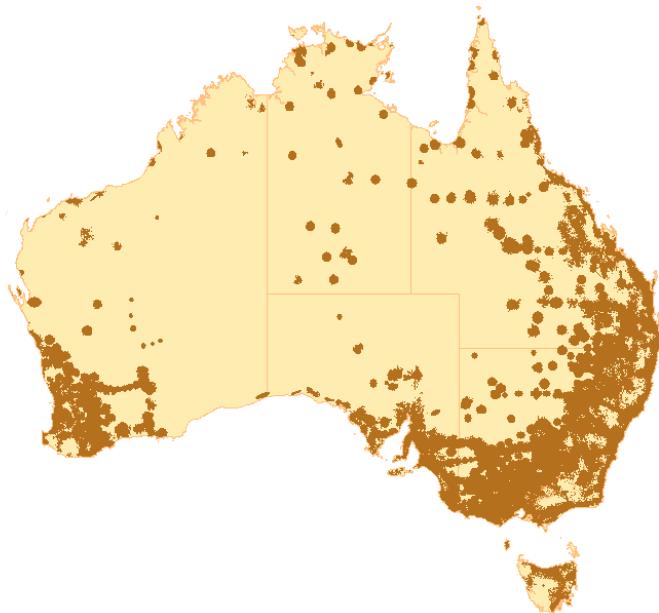
Source: Department of Communications, Information Technology and the Arts (DCITA), A Users' Guide to Australian Telecommunications 2002, 12 November 2002. (http://www.dcita.gov.au/Article/0,,2_3-3_143-4_112188,00.html)

The availability of mobile services to Australia's population and across Australia's landmass continues to grow.

Box 2.5

EXTENDING MOBILE TELECOMMUNICATIONS COVERAGE

> The Australian Government has provided $15.6 million 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, and people travelling on regional highways near these towns. Telstra was awarded the tender to complete this work.

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

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[15] Telstra Media Release, Telstra Country Wide $250 million package to customers, 4 June 2003, 162/2003.

The coverage provided by individual mobile network providers varies from place to place.[16] Extensive geographic coverage makes mobile telecommunications services available to people living and visiting rural and remote parts of Australia (see box 2.6). Across OECD countries, population coverage has been identified as a factor that supports growth in mobile penetration.

Box 2.6

GP RECEIVES LIFE-SAVING SURGERY INSTRUCTIONS VIA MOBILE PHONE RURAL SOUTH AUSTRALIA

A doctor in South Australia's south-east recounted how he performed a life-saving operation on an 11-year-old boy while receiving instructions over a mobile phone.

A trail-bike accident near his Naracoorte home left Harry Moyle with brain swelling that only a neurosurgeon would normally operate on.

The boy's GP, Jeff Taylor, performed the surgery while receiving instructions over the phone from the head of neurosurgery at the Adelaide Women's and Children's Hospital.

Dr Taylor says he had to act quickly when the boy's condition deteriorated.

Source: ABC News Online Tuesday, 8 June 2004, www.abc.net.au/news/newsitems/s1126959.htm

In addition to investment in networks, undertaken largely (but not exclusively) by CSPs, mobile network carriers 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 and Vodafone that allow its customers to access the mobile service networks across Australia.

The Australian Government has created a series of programs to increase mobile coverage.[17] The 2004-05 Regional Partnerships for Growth and Security form part of the Australian Government'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.

- Mobile Phone Highway Program — provided $22.7 million to facilitate near continuous mobile phone coverage along almost 10 000 kms 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 and are increasing mobile phone coverage for 132 towns with populations over 500. Under the program, towns have been progressively receiving CDMA coverage with 40 of these towns also targeted to receive GSM coverage to supplement existing coverage. Telstra, the successful tenderer, has encountered delays in rolling out the infrastructure in some towns. By August 2004, Telstra had provided mobile phone coverage to 121 out of 132 towns.

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

[17] 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.

- Regional Mobile Phone Program — completed in 2004. The program received $49 million over two years from 2002-03. The Program provided: $18.8 million towards improving mobile phone coverage to 55 towns with populations of less than 500; $19.1 million is being provided towards coverage of 62 lengths along 34 regional highways; $7 million to improve mobile phone coverage in the south west of Western Australia under the Wireless West project, and $3.9 million for the Satellite Phone Subsidy Scheme for people living or working in remote areas without mobile phone coverage. The remaining funds under this program will be expended in 2004-05 and the expanded Scheme will continue.

- Expansion of Terrestrial Mobile Phone Coverage Program — this Program involves $15.6 million to provide new or improved mobile phone coverage to 30 000 people in 62 rural and regional towns between January 2005 and November 2006 (see box 2.5).

Market share

The market share for the four mobile network carriers, Telstra, Optus, Vodafone and Hutchison changed slightly between 2002-03 and 2003-04. Figure 2.5 illustrates the market share of each carrier in terms of mobile revenue. The figure shows that although Telstra still has the largest market share, Optus, Vodafone and Hutchison are continuing to grow.

Figure 2.5

MOBILE REVENUE MARKET SHARE BY MOBILE NETWORK CARRIERS
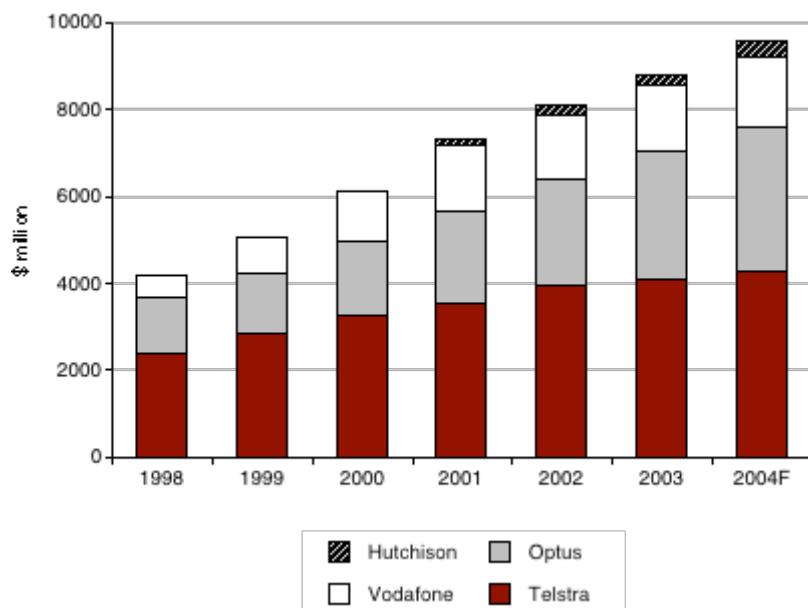
Note: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.31.

Resellers

Resellers are also considered CSPs and in 2001-02 there were nine resellers in the Australian market.[18] Examples of resellers in Australia include, but are not limited to, Primus Mobile (Telstra CDMA and GSM), SIMplus (Optus), and B-Digital (Optus).

Resellers are distinguished from mobile network carriers as they do not necessarily own network infrastructure or have a spectrum allocation. Instead, resellers purchase end-to-end mobile services from the mobile network operators and bill customers in their own names. At the end of the reporting period 2002, 10 per cent of services in operation were billed by resellers according to these arrangements.[19]

Virtual mobile network operators (VMNOs)

VMNOs are also regarded as CSPs and offer mobile services to customers using a third party's network. For example, Virgin Mobile purchases wholesale mobile capacity from Optus. AAPT Mobile is also a VMNO. Although there is some industry debate regarding what exactly constitutes an VMNO, 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 pre-paid and post-paid billing and value-added services (voice mail box, etc) and facilities; and

- generally have control over their subscriber information, independent of any mobile carrier.[20]

These characteristics differentiate VMNOs from conventional resellers, particularly because they have more control over their retailing operation and therefore increased capacity to provide different service offerings and prices.

Although VMNOs do not have their own spectrum allocation, they do have their own mobile network code, issue their own SIM cards, and operate their own mobile switching centres. Bills to customers are issued by the CSP.

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

Content service providers and program developers

Content service providers make available information and entertainment services, and act 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. These 'mobile' information-bundles add value to the mobile entertainment value chain by delivering valuable content in a format appropriate for mobile distribution.

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[18] Australian Communications Authority (ACA), 2002, *Telecommunications Performance Report 2001-02*, Melbourne, p. 161.

[19] Australian Communications Authority (ACA), 2002, *Telecommunications Performance Report 2001-02*, Melbourne.

[20] Australian Competition and Consumer Commission (ACCC), Mobile Services Review 2003: An ACCC Discussion Paper, April 2003.

The relationship between mobile network operators and content service providers has been redefined with the introduction of 3G mobile services. The content available on 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 (see box 2.7).

Box 2.7

ENTERTAINMENT SERVICES ON YOUR MOBILE

OPTUS makes TV mobile

In November 2003, Optus Mobile made viewing television on mobile phones a reality with the launch of a new streaming service offering 24x7 retransmission of ABC and SBS and transmission of CNN's international service.

Optus Zoo offers a suite of mobile services including: TV streaming, video downloads, sports results, games, ring tones, horoscopes, jokes and webcams.

Optus customers using the latest mobile phones are able to view live TV programs and access other entertainment, information and mobile content.

'3' video highlights

In July 2003, Hutchison's 3 announced a take over of the sponsorship of the Australian Test Cricket Team. This provides video highlights of every wicket that falls during a match, every batting milestone and wrap-ups at the end of each innings. 3 customers could watch video clips of the action, previously only seen on a television screen.

Since its inception, 3 customers have been able to access footage from news programs, sporting events and even television shows such as Big Brother, footage only ever able to be view on a television set or, more recently, the internet. The development of 3G technology makes the latest entertainment services far more accessible.

Source: Information from www.optus.com.au and information provided by Hutchison

Hutchison has upwards of 45 content providers for 3 services. Some examples of the types of content available and the content providers operating on 3 include:

- comedy - supplied by ABC, Channel Nine, and the Comedy Channel;

- news – supplied by AAP and Sky News;

- sport – supplied by Channel 9, Fox Sports as well as Coastalwatch, which provides Surfcam, live streaming of beach footage, including surf conditions;

- music – supplied by Sony and Warner; and

- general entertainment information - Supplied by HWW, providing restaurant and bar reviews and listings. Included in this, is 'Your Movies', the first m-site, a website formatted especially for a mobile phone.

Examples of content aggregators operating in Australia are:

- Legion Interactive — facilitates interactive communications through Interactive Voice Response (IVR), Short Message Services (SMS), Multi-media Message Services (MMS), Interactive Voice Messaging (IVM), Email, the internet, Wireless Application Protocol (WAP) and interactive television;

- Infospace — delivering application services to leading wireless carriers; and

- ITouch — a 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 internet access as well as wireless access.

A content aggregator can also position itself as a Wireless Application Service Provider (WASP).

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 the program developers is often supported through mobile businesses providing access to development tools, as well as other supports. The work of Ericsson and Hutchison is described below.

Ericsson Australia works closely with program developers through Ericsson Mobility World, a global partnering program, to accelerate the development and market deployment of innovative applications and services to stimulate end-user uptake of new telecommunication services. Ericsson has over 6,000 members registered in the Australian and New Zealand program. This open, industry-wide initiative brings together all the various players — operators, ISPs, content providers, enterprises and developers — to increase revenue through new mobile services. Ericsson Mobility World supports developers across applications with practical, hands-on tools, information and services. These include:

- technical documents;

- software development kits (SDKs);

- testing and verification services;

- developer support;

- discussion forums;

- business and technical training;

- invitations to global and local events, application competitions;

- monthly newsletter;

- latest update via email and SMS notification; and

- competition news (see box 2.8)

Box 2.8

FRONTIER – ERICSSON APPLICATION DEVELOPER'S COMPETITION

In an effort to accelerate the development and market deployment of other innovative applications and services, The Australian and Ericsson have launched a Trans-Tasman developer competition called Frontier. Frontier is an initiative of Ericsson Mobility World, running annually since 2002. New Zealand or Australian developers with a market-ready and demonstrable mobile and/or broadband application are eligible to enter.

Source: Information provided by Ericsson Australia

3 has also established formal relationships with program developers. It is through these relationships, that include providing developers with access to development tools, that industry specific applications are built for 3G mobile applications (see box 2.9). The 'Developers on 3' program provides the latest development tools, software downloads and up-to-date information on industry initiatives. The program is specifically targeted at:

- independent and corporate developers;

- independent software vendors (ISV);

- system integrators (SI); and

- application service providers (ASP).

'Developers on 3' gives the Australian developer community the power to create industry-leading 3G applications. All handsets support J2ME Java and the Motorola A920 and A925 support the Symbian operating system.

Box 2.9

A NEW MOBILE APPLICATION

3 has joined forces with Australian developers Echo Solutions and Mapshed to launch Loc3, the first location-based mobile data service for the real estate industry.

Loc3 harnesses the speed of 3's network and the versatility of Motorola A925 phones and NetConnect wireless data cards, to boost revenue and cut operating costs for the real estate industry. Using the Motorola A925, Loc3 has saved real estate agents several hours a day by enabling them to download, enter and send data at high speed in the field. Reports can be generated on the spot and properties are able to be viewed online only a few minutes after their valuation.

By entering the required location into Loc3, agents can use the high-speed 3 phones or a lap top with a wireless, 3 NetConnect Card, to download accurate maps and aerial photos, calculate distances from points of interest (eg schools or transport), call-up sales histories, current listings, appraisals and forcats while on location with a potential vendor. Downloads at broadband speeds are available in 3's Video Zones.

After providing an on-the-spot valuation, images and videos of a new property shot using the A925 phone can be emailed back to the office and to the vendor just seconds after the meeting.

Source: Information provided by Hutchison

Retailers

Retailers offer mobile services to end-users on behalf of CSPs. Customers can purchase mobile telecommunications hardware and services from two types of retail outlets: speciality outlets that may be branded and sometimes owned by the CSP, or outlets that sell mobile telecommunications hardware and services as part of a broad range of products.

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 pre-paid arrangement or on an on-going post-payment basis where customers are billed for the services they use. The exclusive retail outlets of mobile network carriers are:

- Hutchison — '3' Shops;

- Telstra — Telstra Shops; and

- Optus — Optus World.

In September 2003, Vodafone sold the remainder of its Vodafone branded retail stores to retailers Digicall Australia and First Mobile, following its sale of stores to the Blackenbury Group in April 2003.

There are also many 'non-branded', but still speciality telecommunications or electronics retail outlets that offer hardware and services of multiple mobile network carriers. Examples include Crazy John's, Strathfield and Fone Zone.

When mobile telecommunications were initially introduced in 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 retailing of mobile telecommunications products. The branded and specialty shops 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 convenience stores, petrol stations, supermarkets, Australia Post etc. Vodafone's retail distribution strategy is an example of the change in the retail model for mobile telecommunications. The most recent development in the retail services allows customers to purchase mobile phones and connect to services online, for example iSIM's mobile products and services can be ordered, activated and recharged online.

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. Today there are an estimated 16 million mobile phones used by nearly 80 per cent of the Australian population, in over 70 per cent of households.[21]

Over the past five years, Australia's mobile telecommunications revenue grew at an average of 15 per cent per year, and the industry earned estimated revenue of around $8.8 billion in 2002-03.[22]

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

- subscriber growth and characteristics;

- competition in Australia's mobile telecommunications industry; and

- trends in international mobile markets.

3.2   Subscriber growth and characteristics

In 2002-03, Australia's mobile penetration rate (i.e. mobile phone services per 100 inhabitants) reached 72.4 per cent (or 14.3 million mobile subscribers). It is estimated that the mobile penetration rate will reach almost 80 per cent (or 16 million subscribers) in 2004.[23] Growth in mobile penetration accounted for 42 per cent of overall revenue growth in the telecommunications industry in 2002-03, and is expected to increase up to 52 per cent in 2003-04.

Figure 3.1 illustrates the increase in mobile penetration in Australia from 1998 to 2004.

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[21]   ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

[22]   ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.13.

[23]   ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

Figure 3.1

MOBILE PENETRATION RATE — AUSTRALIA, 1998 TO 2004
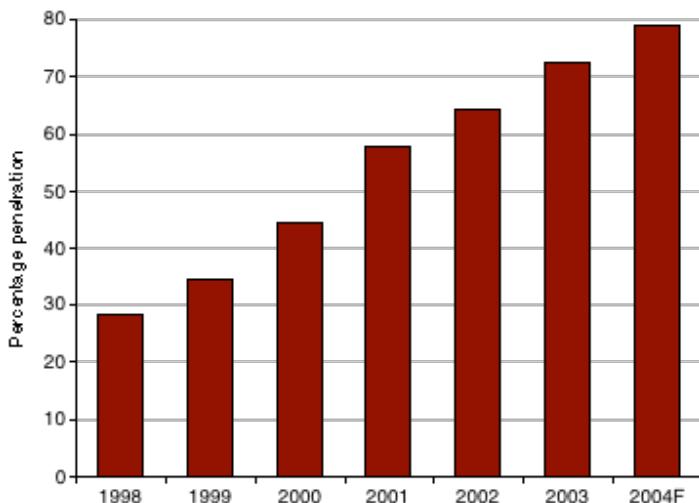
Note: F indicates forecasted values.
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

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). This is the highest growth rate over all periods at a time when the market was in its infancy. In recent years the growth rate has not been as strong given the high penetration rate in the market. The estimated growth rate in mobile subscriber numbers from 2003 to 2004 remained above 10 per cent.

Figure 3.2

MOBILE TELEPHONE GROWTH RATE
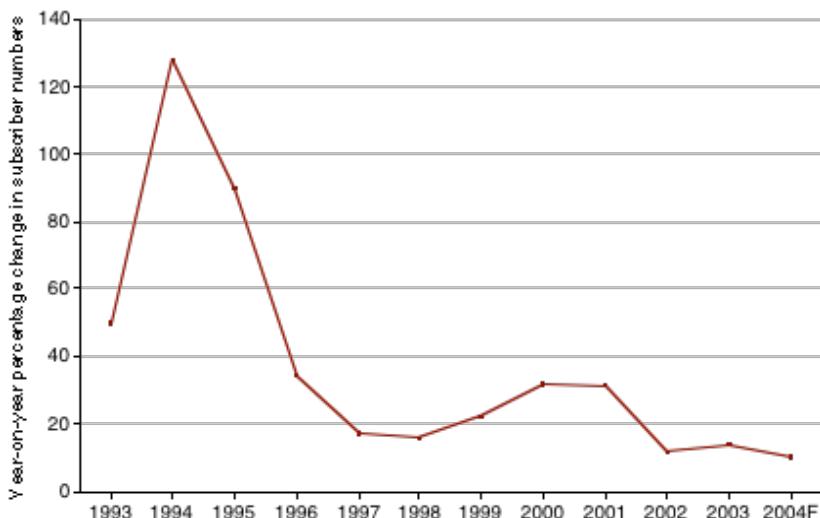
Note: F indicates forecasted values.
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

Peaks in subscriber growth appear to be associated with the introduction of new networks. As described in chapter 2, the 2G GSM network was introduced in 1993 and the 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, with the launch of Telstra's '3G Mobile Loop Service' and Hutchison's '3' services. Compared to GSM, the introduction of 3G services has not had an equally significant effect on subscriber numbers. By February 2004, Hutchison had over 100 000 customers signed on to it's 3 network.[24]

The full impact of 3G services on mobile growth rates will be observed over the coming years, when more mobile carriers are providing 3G services (e.g. when Optus, Vodafone and Telstra launch their 3G services in 2005), as handsets evolve into user devices and as opportunities to develop new content and applications are taken up (see chapter 8).

Prepaid mobile services

Recent subscriber growth has been mainly driven by the continued increase in prepaid customers. From 1998 to 2003, prepaid customers in Australia increased by 36 per cent.[25] By June 2003, more than 39 per cent of all mobile phone services were prepaid, compared to 33 per cent in the previous year. It is estimated that 45 per cent of total mobile subscribers will be prepaid customers by the end of 2003-04.

Figure 3.3

**MOBILE PREPAID SUBSCRIBERS AS A PERCENTAGE OF ALL SUBSCRIBERS, AUSTRALIA 1998 TO 2004**
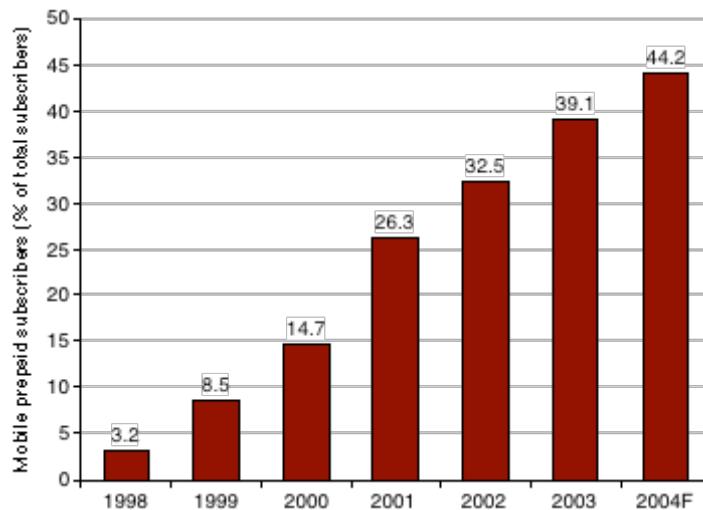
Note: F indicates forecasted values.
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

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[24]   Hutchison Telecom, *Annual Report 2003*, p.10.
[25]   ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

This continued growth in prepaid customers in 2003 underpinned the overall growth in subscriber numbers (see figure 3.4).

Prepaid services offer an inexpensive way to enter the mobile market without the credit-worthiness checks associated with many mobile contracts, and allow customers to better manage their mobile phone expenditure.

The trend to 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.[26]

Figure 3.4

PREPAID VERSUS POST-PAID SUBSCRIBERS
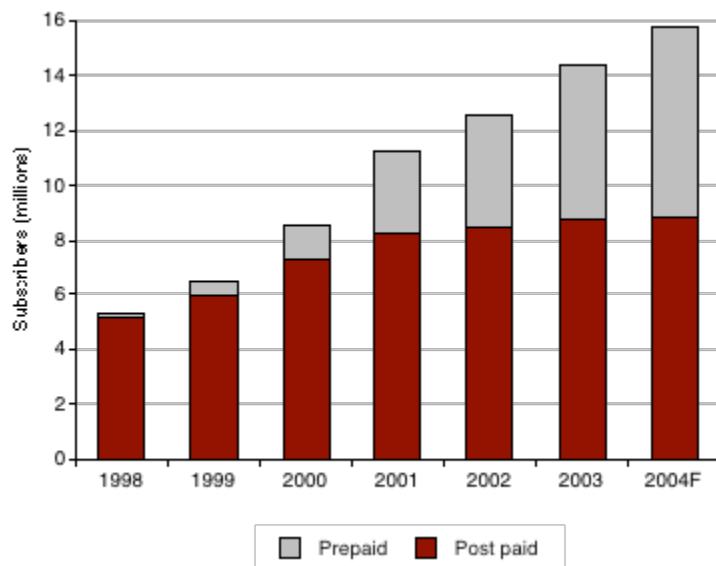
Note: F indicates forecasted values.
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

Short message service (SMS)

SMS services are another major source of growth in the mobile telecommunication industry. During the 12-months to June 2003, an estimated 3.95 billion messages (or an average of 294 messages per mobile phone subscriber per year) were sent, reflecting an increase of 44 per cent since the previous year.[27] Furthermore, 57 per cent of households and 40 per cent of small businesses reported using SMS services, reflecting an increase of 10 per cent since 2001.

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[26]   OECD, *Communications Outlook 2003*, 2003.
[27]   Australian Communications Authority, 2003, *Telecommunications Performance Report 2002-03*, Melbourne, p.89.

Box 3.1

MOBILE DATA SOLUTIONS FLY HIGH

Optus Mobile has launched an Australian first — a SMS ticket-less flight booking and information service for new airline Jetstar.

Optus and Start Corporation, an Australian provider of enterprise SMS applications, have worked together to develop 'JetSMS' following an initiative by Jetstar. Once registered for the service, a Jetstar customer will be able to use SMS to make flight bookings.

To make a flight booking, a customer types an SMS from their mobile phone to request flight information. An SMS is then sent back with the details of available flights. The customer then sends another SMS to confirm the flight required. Details of the confirmed booking are then sent to the phone, again via SMS. The customer simply retains the final SMS as confirmation of the booking and presents this to the check-in staff at the airport.

Source: Information from www.optus.com.au

By June 2003, SMS services accounted for an average of 9 per cent of revenue received by mobile service providers, illustrating the growing importance of SMS services in the mobile telecommunications market (see figure 3.5 below).[28]

Figure 3.5

NUMBER OF SHORT MESSAGE SERVICES (SMS)
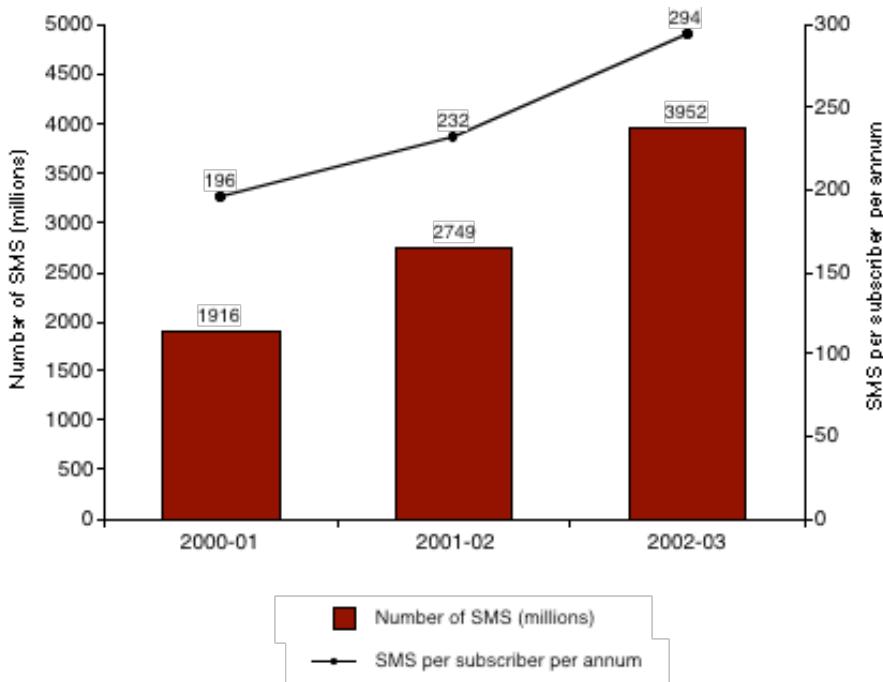
Source: Australian Communications Authority, 2003, *Telecommunications Performance Report 2002-03*, Melbourne, p.89.

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

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

Premium SMS services seem likely to continue to grow as brands have more confidence in adopting premium SMS with the release of the permanent premium SMS number range. Following a successful industry trial of premium rate SMS and multi-media message services (MMS) using seven-digit 188 numbers, the Australian Communications Authority (ACA) released new number ranges for these services. The numbers released are 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 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. Other shows will also generate high SMS volumes include Australian Idol and Getaway. (See box 3.2 for more information regarding the interaction between SMS and television.)

Box 3.2

INTERACTION BETWEEN TELEVISION AND MOBILE TECHNOLOGIES

Hutchison's 3 MMS capabilities have led to a new level of interaction with television programs. Big Brother, the first reality show to use premium SMS, joined with 3 to become the first reality program to stream live video footage to a mobile handset. 3 customers were also able to partake in 'Virtual Big Brother', a world first interactive game that rewards members for interacting with the Big Brother series.

In addition to this, 3 customers can send video messages to Big Brother Housemates and take part in eviction voting.

Source: Information provided Hutchison

Households with mobile phones

Between 1998 and 2002, the proportion of Australian households with access to a mobile telephone increased from 44 per cent to 72 per cent (see table 3.1).

Table 3.1

HOUSEHOLD ACCESS TO MOBILE PHONES — BY STATE

State	Digital mobile phones		
	1998 (%)	2000 (%)	2002 (%)
NSW	34	58	72
Victoria	36	60	74
Queensland	33	58	71
SA	28	51	69
WA	37	57	73
Tasmania	25	46	62
NT	39	61	73
ACT	41	67	80
Australia	**44**	**61**	**72**

Source: Australian Bureau of Statistics (ABS), 2000, *Household use of information technology*, ABS Cat. No. 8146.0; and Australian Bureau of Statistics (ABS), 2001-02, *Household use of information technology*, ABS Cat. No. 8146.0

Household access to mobile telecommunications was highest in the ACT, where 80 per cent of households had access to a mobile phone in 2002. Tasmania had the lowest proportion of households with access to mobile telecommunications, at 62 per cent in 2002 — however, this represented a 37 per cent increase in the proportion of households that had access only four years before. South Australia showed the highest increase in the uptake of mobile phones, increasing from only 28 per cent in 1998 to almost 70 per cent in 2002.

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 2002, the metropolitan market accounted for 88 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), in contrast to the relatively sharp increase in regional revenue growth (55.2 per cent in 2001). In 2004, revenue growth is anticipated to remain above 10 per cent in metropolitan markets and around 5 per cent in regional markets.

Figure 3.6

METROPOLITAN AND REGIONAL MOBILE REVENUE GROWTH (%)
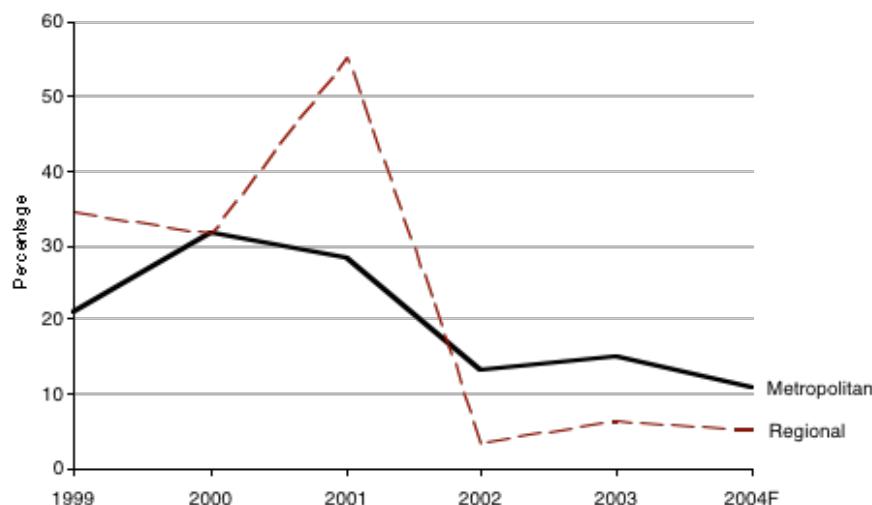
Source: ABN-AMRO, November 2004, Telecommunication Services: Australian Telecommunications 2004, p.38.

The mobile subscriber market shares in metropolitan and regional areas remains relatively unchanged since 1998. The market share of metropolitan subscribers was 90 per cent in 1998 compared to 88.8 per cent in 2003. The market share of regional mobile subscribers increased from 10 per cent in 1998 to be 11.2 per cent in 2003.[29]

Box 3.3 describes how mobile telecommunications are being developed for use by consumers in rural and regional Australia.

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[29]   ABN-AMRO, November 2004, Telecommunication Services: Australian Telecommunications 2004, p.38.

Box 3.3

MOBILES IMPROVES HEALTH SERVICES IN AUSTRALIA

Telstra is working together with health group Loddon-Mallee Health Alliance (LMHA) to create the service known as a single carrier radio transmission technology (1xRTT) which operates over the CDMA network.

The service will give customers a 100 per cent mobile network upgrade and enables a high-speed wireless data service that is an alternative connection to the internet. It allows customers to surf the internet, access their own office networks and send and receive emails and information through various technologies including a mobile phone.

The rollout of this technology is the first stage of a comprehensive upgrade for hospitals, medical practitioners and ancillary services, The new service is important for the future of health care services in rural Australia. Increased speeds in mobile data will assist health professionals to access files and information faster and in a more flexible way. The new technology creates an opportunity to deliver high quality health care services in remote areas of Australia and in addition, help such remote areas respond effectively to future advances in technology.

As of June 2004 Victoria was the first state to receive the new service. Telstra expects a 98 per cent coverage rate across Australia by the end of 2004.

Source: Pharmacist Magazine, Volume 22, Number 3, March 2004.

3.3 Competition in Australia's mobile telecommunications industry

Statistics also show that the Australian mobile telecommunications markets, benchmarked across all OECD countries, offers a very high degree of competition. In February 2002, the competitiveness of mobile telecommunications pricing was measured across 27 countries. The study showed that Australia ranked fifth in the level of competitiveness for business mobile services and third for residential mobile services.

During 2001-02, Australians could choose a mobile service and fee structure from thirteen CSPs and select one of about 700 different rate plans.[30] It is possible to obtain a handset and connect to a mobile service in Australia, for at least a few months, for less than $100.[31]

The rate at which customers change providers is called 'customer churn'. It provides an indication of the competitive pressures in the market as customers either port their number to another provider or when they switch to another provider without retaining their number. In 2003, based on net growth and mobile number portability (MNP), the ACA estimated that the churn rate was somewhere between the five per cent level associated with MNP and an estimated maximum of 20 per cent.[32] Factors that can impact on churn rates include use of 24-month contracts, early termination charges, porting fees, subscriber identity module locks for prepaid services, and the increasing availability of customer loyalty packages.

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[30] As reported in the Australian Communications Authority (ACA), Telecommunications Performance Report 2001-02: Industry overview, 2001, p.163.

[31] OECD, *Communications Outlook 2003*, 2003.

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

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 23 per cent.[33] Price decreases were also reported for the period 1996-97 to 1997-98.[34] However, in recent years the price decreases have become smaller, and in the most recent period 2001-02 to 2002-03 a price increase of 1 per cent was recorded (see figure 3.7).

Figure 3.7

PERCENTAGE CHANGE IN THE PRICE OF MOBILE TELEPHONY, 1997-98 TO 2002-03
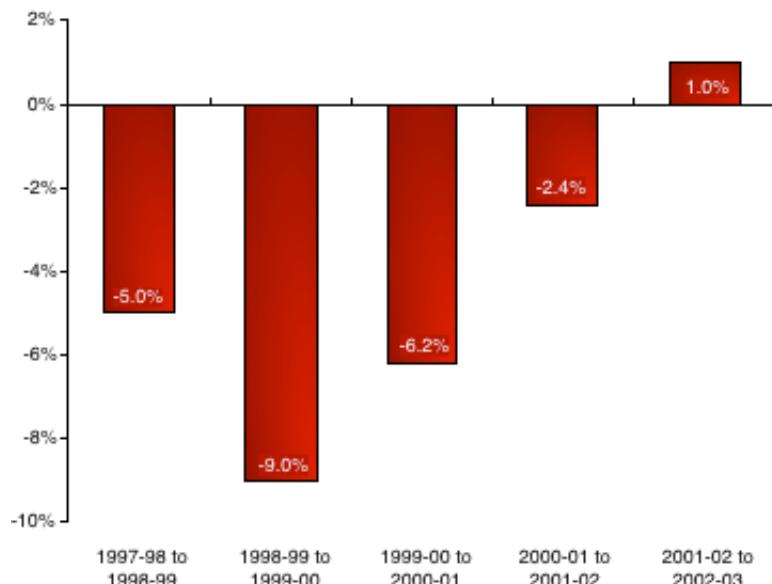
Source: Australian Competition and Consumer Commission (ACCC), *Telecommunications report: Report 2 Changes in the prices paid for telecommunications services in Australia 1997-98 to 2002-03*, p.66.

Substituting mobile telephones for landlines

Since 2000-01, Australia has had more mobile services than fixed services. In June 2003, there were 14.3 million mobile services compared to 11.6 million fixed services.[35]

> … roughly 24 percent of all calls made in Australia are made on a mobile phone (compared with 50 percent for the United States).[36]

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[33] The Allen Consulting Group *Australian Mobile Telecommunications Industry Economic Significance Report for 2003* reported that in the period 1996-97 to 2001-02 the price of mobile telephony decreased by almost 30 per cent. This information was sourced from the ACA Report *Telecommunications report: Report 2 Changes in the prices paid for telecommunications services in Australia 1997-98 to 2001-02*, p. 137. The ACA's report for 1997-98 to 2002-03 has revised the data on the price decreases in mobile telephony. The information in this section, including in figure 3.7, relies on the data presented in the most recent ACA report.

[34] Australian Competition and Consumer Commission (ACCC), *Telecommunications report: Report 2 Changes in the prices paid for telecommunications services in Australia 1997-98 to 2001-02*, p. 137.

[35] IBISWorld Pty Ltd, 20 May 2004, *J7122 - Mobile Telecommunications Carriers in Australia*, p.5.

[36] IBISWorld Pty Ltd, 20 May 2004, J7122 - Mobile Telecommunications Carriers in Australia, p.5.

Traditionally, households have had a mobile telephone *in addition to* a fixed telephone. However, anecdotally there is an emerging trend in 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 their location, the decreasing price of mobile telephony services that offers a mobile-only household a financially competitive proposition, and the increase in mobile phone usage by the over 50 year customer age group.

This trend is also evident worldwide. Today, there are around 1.3 billion mobile subscribers compared to 1.045 billion landlines, and it is estimated that there are more mobile telephones in the world than PCs.[37] In 2002, the number of mobile phone subscribers exceeded the number of fixed line subscriber's in Europe as a whole.[38]

3.4 Trends in international mobile markets

Australia compared to the international mobile market

Figure 3.1 above identified the rapid growth rates in mobile telecommunication subscriber numbers in Australia since the early 1990s. This growth translated to a mobile telecommunications penetration rate of 26 percent by mid-1997. By mid-1999, this rate had increased to 39.5 percent, and in 2003 Australia had a mobile telecommunications penetration rate of 72 percent.

In contrast to Australia's strong uptake of mobile telephony in the early 1990s, OECD countries have experienced strong uptake of mobile telecommunications in the late 1990s and early 2000s. For example, in OECD countries, more than 60 per cent of people with mobile phones in 2001 had obtained that connection since 1999. By 2001 more than one in every two people in the OECD countries had a mobile phone and in countries like Luxembourg, there was nearly one mobile phone for every person.

Figure 3.8 illustrates the increase in mobile penetration in selected OECD countries, including the OECD average, over six years. In 2001, Luxembourg had the highest penetration rate and Mexico the lowest. In 2001, Australia ranked just above the OECD average.

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[37] IBISWorld Pty Ltd, 20 May 2004, *J7122 - Mobile Telecommunications Carriers in Australia*, p.5.

[38] netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

Figure 3.8

MOBILE PENETRATION IN SELECTED OECD COUNTRIES — PENETRATION PER 100 INHABITANTS (1996 – 2001)
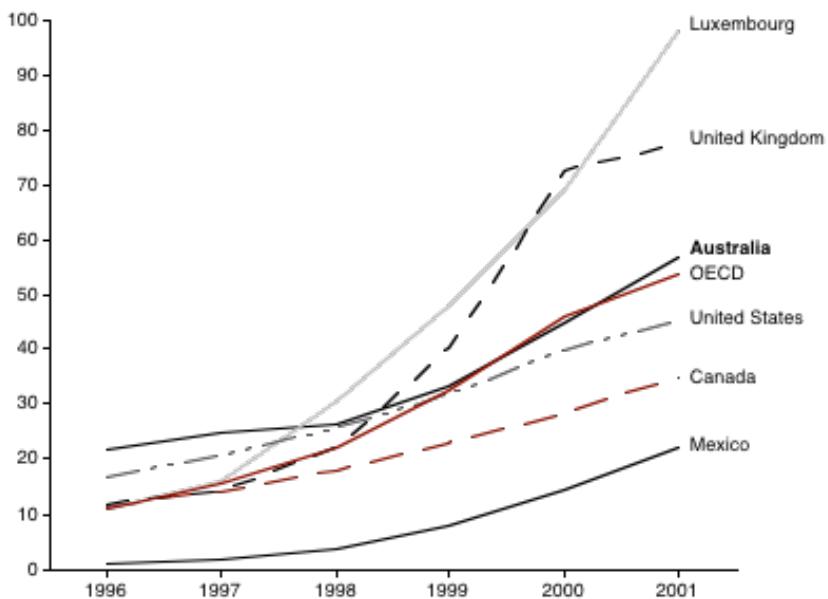
Source: OECD, *Communications Outlook 2003*, 2003.

In 2003, Australia's mobile penetration rate ranked Australia fifth in terms of market development in the Asia-Pacific region (see table 3.2) Taiwan was the top ranking country with a penetration rate of 110 per cent, followed by Hong Kong with more than 90 per cent penetration and Japan with 82 per cent. Australia is now ranked equal 20th in terms of per capita mobiles worldwide.

Penetration rate of more than 100 per cent may seem unlikely, but clearly are being achieved in some countries. These high penetration rates are associated with both private and corporate mobile telephony use. There is an increasing trend for mobile phone customers to make use of more than one SIM card and/or mobile phone handset, allowing them to have different mobile numbers for business and personal use. Corporate users, including government and business, could drive mobile penetration rates over 100 per cent as they take up new mobile technologies for example, mobile devices that wirelessly enable different parts of their enterprises and make use of devices for asset tracking, etc (see chapter 8).[39]

In three countries (Israel, Sweden, Taiwan) mobile penetration has now exceeded 100 per cent of the resident population. In a further four countries (Czech Republic, Greece, Hong Kong, Italy) it has now exceeded 95 per cent mobile penetration. It is reported that demand by business and government for mobile devices that can wirelessly enable different parts of their enterprises, make use of devices for asset tracking, etc is one of the major area of growth with potential to drive penetration well above the 100 per cent.[40]

[39]   Merrill Lynch Global Wireless Matrix, First Quarter 2004, publication date 7th July 2004. p 16, as provided by Telstra.

[40]   Merrill Lynch Global Wireless Matrix, First Quarter 2004, publication date 7th July 2004. p 16, as provided by Telstra.

Table 3.2

ASIA-PACIFIC RANKING IN MOBILE SERVICE PENETRATION

Country	Penetration	
	2002 (%)	2003 (%)
Taiwan	104.5	110.0
Hong Kong	78.3	90+
Singapore	69.4	79.4
Australia	**64.5**	**72.4**
Korea	63.9	68.8*
Japan	55.7	82.0
Macau	49.3	65.0
Brunei	41.4	45.0
Malaysia	36.4	38.0

* For 2003, penetration rate in South Korea.
Source: Australian Communications Authority (ACA), *Telecommunications Performance Report 2001-02: Industry overview*, 2001, Paul Budde Communication Pty Ltd, June 2003, Taiwan, Hong Kong and Macau — 2003 Telecommunications and Information Highways in Asia (Volume 6), http://www.budde.com.au/; IDA Singapore, Statistics on Telecom Services for 2003 (Jan – Jun), http://www.ida.gov.sg/; total telecommunications, Brunei Darussalam - Data, Wireless Communications and Broadcasting, February 2004, http://www.totel.com.au/; and Hong Kong Productivity Council, Lawrence Cheung, 2003, A perspective on the mobile markets in Japan and Korea, www.trp.hku.hk/papers/2003/japan3.pdf

International development in mobile telecommunications

The growth trends of the mobile telecommunications industry in Australia display some similarities and some differences to trends observed in the Asian and European markets.

The Asian mobile telecommunications market

Currently, there are a number of mature mobile markets in the Asian telecommunications industry. Countries with mature mobile markets are:[41]

- Taiwan (fully saturated) — mobile phone subscribers in Taiwan totalled 25.1 million at end the June 2003, representing over 100 per cent penetration rate.

- Hong Kong (saturated) — the market reached a penetration rate of over 90 per cent in 2003, representing over 6 million mobile phone subscribers.

- Singapore — while highly saturated the market continues to expand modestly, with the penetration rate of 82 per cent.

- South Korea — as of May 2004, the three wireless operators, SK Telecom, KTF and LG Telecom have over 35 million subscribers.

In these mature markets there is a significant focus by operators to increase revenue from value-added services (VAS), i.e. revenue from ringtones, games, icons and other personalisation services.

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[41] Gordon Bennett, Asia Pacific Research Group, 2004, *Introduction to the Asian Mobile Services Market*, www.aprg.com, cited 27 May 2004.

Asia's developing markets are also showing strong growth trends, for example:[42]

- China — one of the most attractive potential markets. If China achieves a penetration rate similar to that of Hong Kong and Taiwan, the PRC[43] market for mobile phones will easily exceed 750 million (see box 3.4).

- The Philippines — in April 2004, there were more than 20 million mobile subscribers (with a population of 75 million), forecast to reach 23 million by the end of 2004.

- Malaysia — the mobile penetration rate is 38 per cent with 11 million subscribers. This is expected to increase to 14.8 million subscribers by the end of 2005.

- India — although the penetration rate is below 1 per cent, the market is growing rapidly. Over the two-month period from April 2003 to June 2003 the number of subscribers increased from 13.3 million to 15.1 million.

- Indonesia — a growing market with significant potential for premium SMS and VAS services. Today there are an estimated 20 million GSM subscribers in the Indonesian market and it is expected that mobile penetration will more than double by 2007.

Like many markets, the market for handsets and mobile devices is a global one. Some industry participants report that growth in these markets assists the Australian market. For example, high demand for handsets in Asian markets was identified as a factor helping to maintain a low handset unit price in Australia.[44]

Box 3.4

THE CHINA MOBILE SERVICES MARKET

In late 2001, China surpassed the United States and became the world's largest market for mobile phone services.

The growth in the Chinese market is clearly reflected in the increase in mobile subscribers, with the number of mobile subscribers increasing from 43 million by the end of 1999 to more than 200 million by early 2003. In May 2004, China Mobile announced that its subscribers rose by another 3 million, bringing their subscriber base to 153.3 million. According to China Mobile this increase is due to its efforts to promote prepaid services, targeting low-end consumers. Currently, over 96 per cent of new subscribers are prepaid subscribers.

China Unicom offers both GSM and CDMA based services. Currently, they have 76 million GSM clients and 20 million CDMA users.

Source: Gordon Bennett, Asia Pacific Research Group, 2004, *Introduction to the Asian Mobile Services Market*, www.aprg.com, cited 27 May 2004.

The European mobile telecommunications market

In 2003, Europe was the second largest GSM market in the world with an average mobile penetration rate of 83 per cent. The highest penetration rate was recorded by Italy, Sweden and Portugal (92 per cent), while Germany, Italy and the UK have the largest mobile services markets (see figure 3.9 below).[45]

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[42] Gordon Bennett, Asia Pacific Research Group, 2004, *Introduction to the Asian Mobile Services Market*, www.aprg.com, cited 27 May 2004.

[43] Peoples Republic of China (PRC)

[44] Industry survey response.

[45] netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

Figure 3.9

NUMBER OF MOBILE USERS IN EUROPE (MILLIONS)
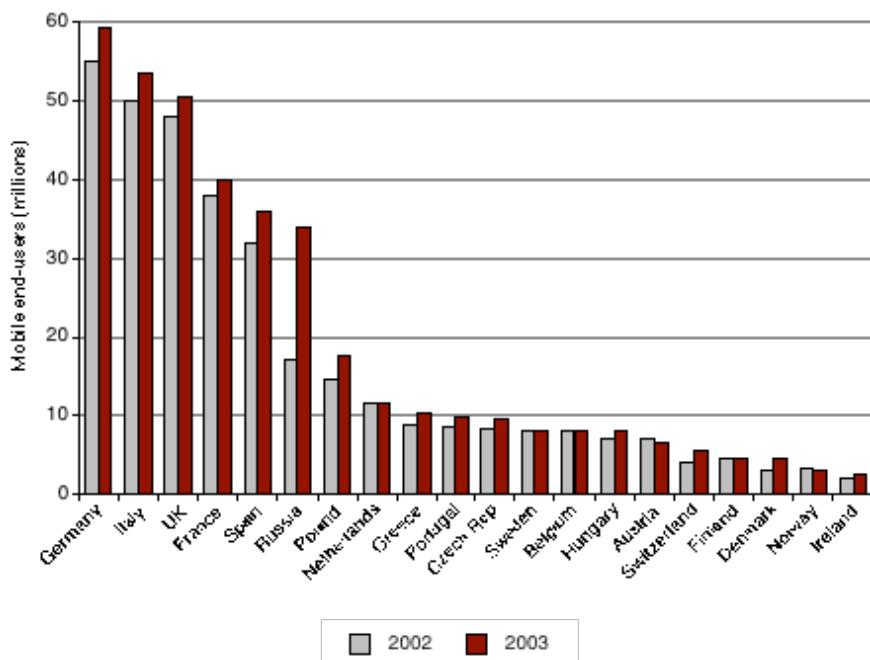
Source: netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

In a mature market, new customers generally prefer prepaid accounts. This explains some of the strong growth currently experienced in the prepaid mobile market. In 2003, prepaid users accounted for 63 per cent of the total European market, compared to 60 per cent in 2002.[46] However, there are still significant differences between some European countries. For example, while more than 90 per cent of users in Italy use prepaid accounts, only 6 per cent of end-users in Finland are prepaid customers. Factors that can contribute to the differences in the level of prepaid adoption across countries include the level of tourism and the size of the 'cash' or informal economy.

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[46]   netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

Figure 3.10

EUROPEAN PRE-PAID VERSUS POST-PAID END-USERS
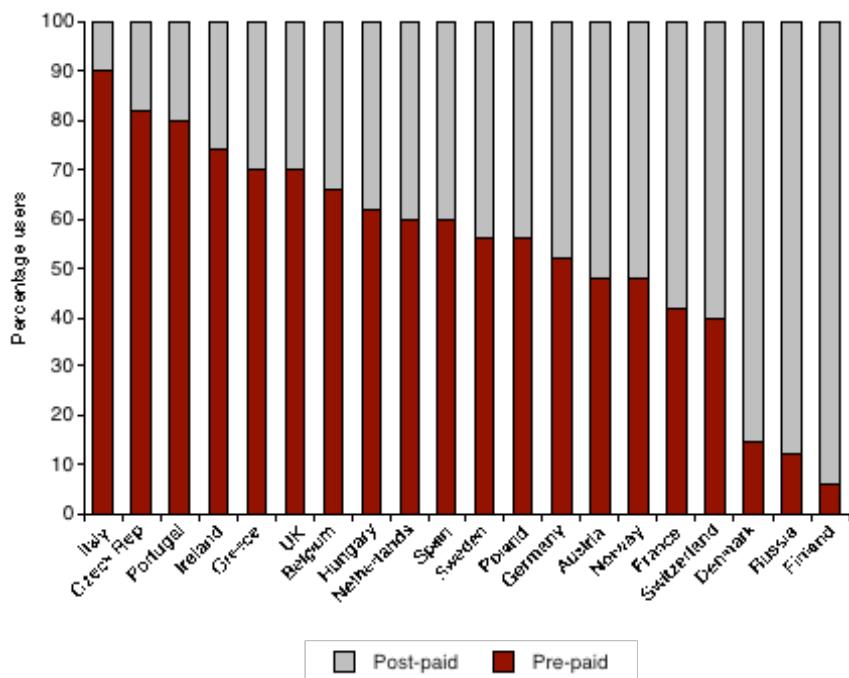
Source: netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris

Another trend in the European mobile market is a continuous decrease in the ARPU for voice services, while data revenue is increasing significantly This decrease is due to the increased use of SMS, MMS and internet browsing.

The use of SMS is widespread. In Europe a total of 15 billion SMS messages are sent every month, i.e. an average of 35 SMS messages per mobile phone subscriber per month. In 2003, Ireland recorded the highest usage of SMS services with an average of 82 SMS messages being sent per subscriber per month.[47] The rate of SMS messages in Europe is considered higher as the average Australian rate at 24 SMS messages per mobile per month.

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[47] netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

Figure 3.11

EUROPEAN SMS MARKET (MILLION)
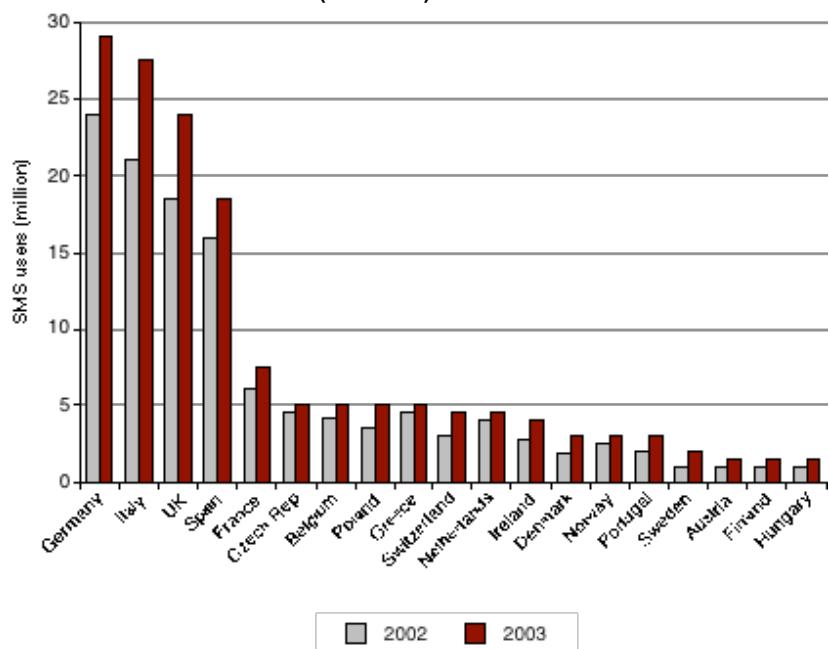
Source: netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

In 2001, Europeans spent around €590 million on downloading content to their mobile phones (ringtones, logos, sports results, stock exchange prices etc), nearly twice as much as the amount of downloads from the internet by PC-users for similar products. By 2003, ringtones alone generated US$3.5 billion on the global market — an increase of 40 per cent since 2002.[48]

Some studies forecast that by 2006, European users will be willing to spend as much as €3.3 billion on downloadable mobile phone content, compared to just €1.7 billion for similar PC content. While other sources forecast worldwide ringtone sales will reach a high of US$5.2 billion in 2008.[49]

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[48] netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.
[49] netsize Mobile Business and Entertainment, 2004, *The netsize Guide – 2004 Edition*, Paris.

Chapter 4

Industry revenue and value added

4.1   Industry revenue

In the year to June 2003, total mobile revenue reached $8.8 billion (including terminating revenues and handset sales) representing almost 28 per cent[50] of total telecommunications revenue. In the past, subscriber numbers have driven the growth of mobile telecommunications revenue. As the market matures, a slow down in mobile subscriber growth has led to a slow down in mobile revenue growth (see table 4.1).

Total year-on-year growth in mobile revenue is declining after peaking in 2000 and 2001 with 20.7 and 19.3 per cent respectively. Although subscriber growth has moderated somewhat during recent years, mobile revenue will continue to grow as a proportion of total telecommunication revenue and is estimated to account for 52 per cent of total telecommunications revenue growth in 2004.[51]

Table 4.1

THE MOBILE TELECOMMUNICATIONS INDUSTRY REVENUE

	2000	2001	2002	2003	2004F
Total revenue ($ m)	6 125	7 305	8 110	8 791	9 582
Growth (year-on-year)	20.7%	19.3%	11.0%	8.4%	9.0%

Note: F indicates forecasted values.
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29.

The increasing importance of data services

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

However, as mobile telecommunications technology continues to develop there is increased use of data compared to voice services. In 1998 data revenue accounted for just over one per cent of total carrier revenue. By 2003, data revenue has increased to 4.6 per cent and is forecast to reach around seven per cent by June 2004.

Table 4.2 shows the trend in the average revenue per user (ARPU) of data and voice components respectively. The proportion of revenue accounted for by data and voice services differs between the carriage service providers. Thus, the impact of the overall ARPU trend is expected to differ between providers.

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[50]   ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.13.
[51]   ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.29

Table 4.2

AVERAGE REVENUE PER USER OF MOBILE SERVICE COMPONENTS ($ per month)

	2000	2001	2002	2003	2004F
Data services*	1.32	2.61	3.57	4.57	6.78
Voice services*	58.27	51.50	50.17	46.56	43.79
Total ARPU	**59.59**	**54.11**	**53.74**	**51.13**	**50.57**

Note: * indicate ACG estimates; and
             F indicates forecasted values.
Source: ABN-AMRO, November 2004, Telecommunication Services: Australian Telecommunications 2004, p.29, 31.

Industry commentators expect future growth in revenue to be driven by increased data usage (see box 4.1). The most commonly used data service is SMS, which was introduced in 1993 and has shown substantial growth since. As identified in chapter 3, SMS message volume grew by 44 per cent from 2002 to 2003, with consumers sending 14 million messages per day across all networks.[52] This growth is evident in the volume of messages, the contribution to revenue and the customers using these services. For example:[53]

- during 2003, 3.9 billion messages were sent in Australia — about 294 SMS per mobile phone user annually, with more than 46 million messages sent on New Years Eve 2003-04 alone;

- Optus handles more than 35 million SMS messages each week from its customer base of 5.5 million, with mobile data representing 15 per cent of Optus' annual mobile service revenue;[54]

- Data revenue for Vodafone increased by 29.3 per cent for the year ended 31 March 2004. Vodafone customers sent over 4 million text messages on Christmas Day 2003 and a further 7 million on New Year's Eve and New Year's Day — with a total of 22.5 million text messages being sent across the Vodafone network during the period from Christmas Eve to New Year's Day. In addition, more than 42 000 PXT messages were sent across the Vodafone network on New Years Eve alone;

- Vodafone is expecting that MMS messages will increase by 20 to 25 per cent during the remainder of 2004; and

- Hutchison experienced healthy growth in MMS usage along with sales of MMS handsets in 2004.

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[52]   http://www.legioninteractive.com.au/, accessed 7 July 2004.
[53]   ACA Telecommunications Performance Report 2001-02, p. 167-8.
[54]   Optus Financial Results, 2004.

Box 4.1

INTERACTION BETWEEN SMS DATA SERVICES AND TELEVISION

The vast majority of SMS usage is accounted for by consumer applications, including person-to-person messaging, voice mail, fax, unified messaging, games, ringtones, pictures, gambling, information services, mobile banking etc.

However, television networks are increasingly focusing on the potential for viewer interaction via mobile phones. SMS/TV applications include voting, games, and reminders.

Not only does this interaction between mobile phones and television give television stations the opportunity to become closer to their viewers, but it also provides a source of revenue.

With SMS services multiple people in a household can enter competitions or take part in voting etc, compared to only one person per household when using the traditional 1900 dial-in services. An estimated one-fifth of Australians have already responded to a TV promotion via their mobile phones. Furthermore, it is estimated that application-to-person traffic, while representing only 12 per cent of total messages, will account for 28 per cent of the commercial value by 2008.

Examples of SMS and television interactions in Australia, include:

- Big Brother 3 — the use of SMS has lifted the number of eviction votes registered at by 20 per cent in 2003, accounting for more than 60 per cent of votes. Note that this increase in the number of votes is despite a 13 per cent decline in total audiences tuning into evictions compared to the previous year;

- MMS was introduced into Big Brother 4, when viewers could send video messages to their favourite house mate using their 3 phone;

- the National IQ Test — with more than 300 000 viewers playing along; and

- the Getaway: Your Call program— receiving about 500 000 SMS votes during the one hour program.

Source: Jane Schulze, The Australian, 17 July 2003, *Rapid Response Program*, accessed 7 July 2004, http://www.legioninteractive.com.au/News/ViewNews.asp?NewsID=32, and Hutchison.

Box 4.2 provides an example of how SMS messaging being trialled in schools to reduce truancy.

Box 4.2

SMS INCREASES SCHOOL ATTENDANCE

Some public schools in South Australia are using text messages to tell parents if their children skip school, with early results showing significant reductions in truancy.

Four high schools in South Australia are using text messages in a bid to improve the state's 92 per cent school attendance rate. The new computer technology automatically informs parents by mobile phone text message when students are absent from school.

The text message system is being used extensively in South Australian government schools where absentee rates have reportedly decreased by at least 50 per cent.

Source: Sydney Morning Herald, Linda Doherty, 22 May 2004, *School Attendance: 'Y is your child wagging school 2dA? Parents track truants by text message'*, **http://www.smh.com.au/** articles/2004/05/21/1085120120340.html

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 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:

Turnover

+   *the increase (or – the decrease) in the value of stocks*

–   *(purchases of inputs used to produce the good or service + transfers in + selected expenses)*

=   **Gross product of the industry or IGP**

For the nation, Gross Domestic Product (GDP) is obtained by summing the gross product of all industries.

Industry Gross Product for the CSP sector

In 2002-03, the estimated IGP for the CSP sector (mobile network carriers and resellers) of the Australian mobile telecommunications industry was $4.8 billion.[55,56]

To provide context of the significance of the economic contribution of the mobile telecommunication industry, figure 4.1 provides estimates of IGP for selected industry sectors. It can be seen that mobile telecommunications IGP is higher than that for the free to air television services; newspapers, printing and publishing; and computer consultancy services sectors and less than accounting services, automotive vehicle component and manufacturing sectors, and accommodation, café and restaurant IGP. Of note, mobile telecommunication services IGP is approximately 30 per cent of size of the IGP for the entire accommodation, café and restaurant industry (see box 4.1).

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[55]   The estimates of IGP in this section are derived from a combination of sources. Mobile network carrier IGP is taken from IBISWorld publication J7122 Mobile Telecommunications Carriers in Australia 2004. Mobile resellers IGP has been derived from IBISWorld publication J7123 Telecommunications Resellers in Australia 2004, and Industry Data Powered by IBISWorld, *C2819 — Automotive Component Manufacturing n.e.c. in Australia*, 30 June 2004, accessed 8 July 2004, http://www.ibisworld.com.au/. The figures presented in this section are in nominal terms.

[56]   The Allen Consulting Group *Australian Mobile Telecommunications Industry Economic Significance Report for 2003* presented information on IGP using the IBIS World publications J7122 and J7123 for 2003. The data in this chapter uses the 2004 IBIS World publications J7122 and J7123. The 2004 publications have updated previous years data. The information in this section relies on the data presented in the 2004 reports.

Figure 4.1

INDUSTRY GROSS PRODUCT FOR SELECTED INDUSTRIES, 2002-03
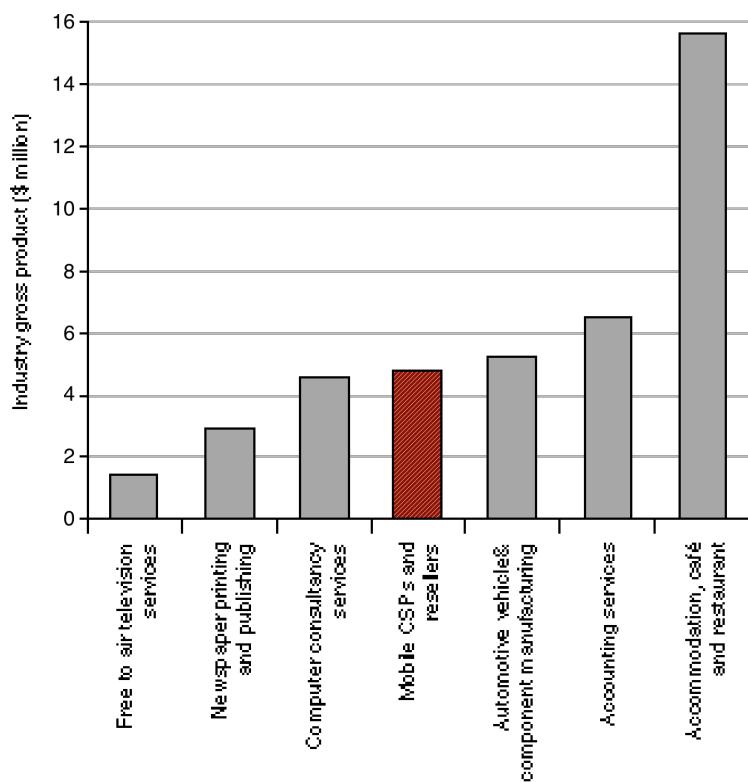
Source: IBISWorld data.

The sector has experienced strong growth in recent years. IGP increased over 80 per cent (in nominal terms) in the CSP sector over the period 1998-99 to 2002-03 (see figure 4.2). The mobile network carriers accounted for over 95 per cent of the mobile sector IGP, although the contribution of the resellers has increased in each period. It is worth noting that the IGP measure provides a financial measure but does not reflect the quality improvements in mobile telecommunications over the period.

Box 4.3

NEW WAYS TO FIND A RESTAURANT OR BAR

With profiles of over 2500 restaurants and bars, 'Eat and Drink on 3' enables 3 customers to search over 2000 restaurants by location, cuisine and price range. A listing of over 500 bars is also provided and can be searched based on their location.

Source: Information provided by Hutchison

Figure 4.2

INDUSTRY GROSS PRODUCT FOR MOBILE NETWORK CARRIERS AND MOBILE RESELLERS, 1997-98 TO 2002-03 ($M, NOMINAL)
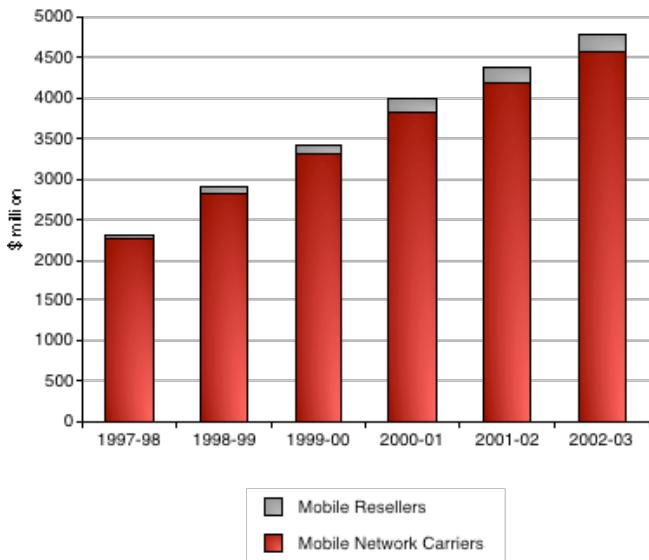
Source: The estimates of IGP in this section are derived from a combination of sources. Mobile network carrier IGP is taken from IBISWorld publication J7122 *Mobile Telecommunications Carriers in Australia*; and Mobile resellers IGP has been derived from IBISWorld publication J7123 *Telecommunications Resellers in Australia*.

The strong growth in the mobile telecommunications sector is evident by its increasing share of IGP in the broader communications services industry. In 1998-99, CSPs accounted for 16 per cent of total communications services IGP. By 2002-03, this had increased to 23 per cent (see figure 4.3).

Figure 4.3

MOBILE NETWORK CARRIERS AND MOBILE RESELLERS CONTRIBUTION TO COMMUNICATIONS SERVICES IGP, 1998 TO 2004
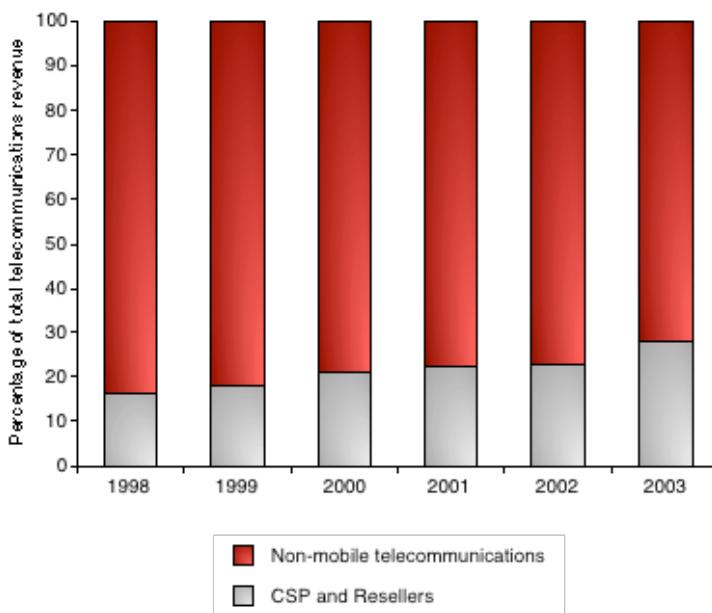
Source: ABN-AMRO, November 2004, *Telecommunication Services: Australian Telecommunications 2004*, p.13.

Chapter 5

Employment

5.1   Trends in employment

Mobile telecommunications stronger growth than telecommunications

It is estimated that in 2002-03 the mobile telecommunications sector (including CSPs and resellers, but excluding hardware and retail) employed approximately 33 000, of the estimated total of 102 000 people employed in the telecommunications industry.[57]

Over the period 1997-98 to 2002-03, employment in the mobile industry[58] increased by 48 per cent compared to an increase of around 30 per cent in the telecommunications industry as a whole. Note that the telecommunications industry as a whole experienced a decline in employment numbers in both 2000-01 and 2001-02, while the mobile industry only experienced a decrease in employment numbers in 2001-02 (see figure 5.1).

Figure 5.1

**TOTAL EMPLOYEES IN TELECOMMUNICATIONS AND MOBILE INDUSTRY, 1996-97 TO 2002-03**
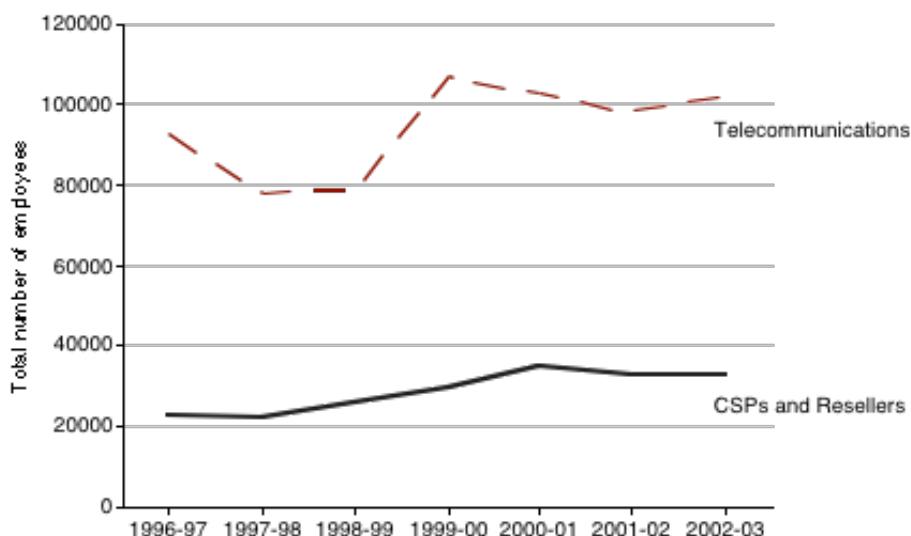
Source: The estimates of employment in this section are derived from a combination of sources. Mobile network carrier employment is taken from IBISWorld publication J7122 *Mobile Telecommunications Carriers in Australia*; Mobile resellers employment has been derived from IBISWorld publication J7123 *Telecommunications Resellers in Australia*; and the Australian Bureau of Statistics, ABS companion data 6291.040.001/6291.055.001 Data Cub e06 (1984 to 2003) (Updated as at 6 June 2003).

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[57]   Employees include the number of working proprietors, working partners, permanent, part-time, temporary and casual employees, and managerial and executive employees working for an establishment during the last pay period in the financial year each year. Employees absent on paid or prepaid leave are included.

[58]   For the purposes of this study, employment in the mobile industry included those employed in the mobile CSP sector and mobile reseller sector. Mobile CSPs and reseller make up nearly 99 per cent of the industry. Data used as published by IBISWorld 2004, publication J7122 and J7123.

An implication of the employment trends is the increasing importance of the mobile industry as an employer in the telecommunications industry. In 1996-97, the mobile industry accounted for just under a quarter of total industry employment. By 2002-03, this had increased to almost one third of total industry employment. Both sectors experienced a slight increase in employment numbers following the decline experienced in 2001-02. Employment in the telecommunications industry as a whole increased by 4 per cent while an increase of more than 1 per cent was experienced in the mobile industry.

The mobile hardware sector comprises two main sub-sectors: mobile telecommunications infrastructure and mobile phone handsets. The number of employees in the mobile hardware sector is not publicly available. However, on the basis of the survey results, it is estimated that there are more than 1500 employees currently working in the Australian mobile hardware sector.

Thus, the mobile telecommunications industry including CSPs, resellers and the hardware sector has at least 34 500 full-time-equivalent positions in 2002-03.

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 94 per cent of employees in 2002-03, while 6 per cent of industry employees worked in the reseller sector (see figure 5.2). Between 1996-97 and 2002-03 the number of full-time equivalent employees increased by 43 per cent in the CSP sector and 66 per cent in the resellers sector.

Figure 5.2

MOBILE TELECOMMUNICATIONS INDUSTRY EMPLOYMENT BY SECTOR, 2002-03
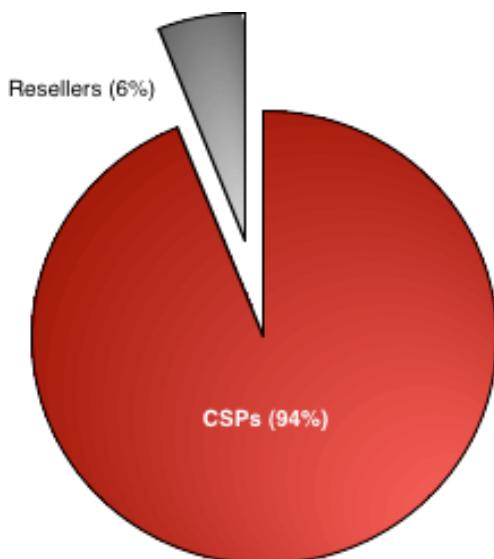
Sources: Mobile network carrier figures are from IBISWorld publication J7122 Mobile Telecommunications Carriers in Australia. Mobile resellers data has been derived from IBISWorld publication J7123 Telecommunications Resellers in Australia and ABN AMRO publication Telecom Networks- Australia: Industry Overview. Hardware data is based on response to the Issues Paper.

5.2   Wages paid

In 2002-03 the value of wages paid by CSPs and resellers in the mobile industry was approximately $1.2 billion (see figure 5.3).[59] Wages growth in the industry has been consistent over the period and nominal wages in the CSP sector increased by almost 60 per cent from 1997-98 to 2002-03.

Figure 5.3

MOBILE TELECOMMUNICATIONS VALUE OF WAGES PAID
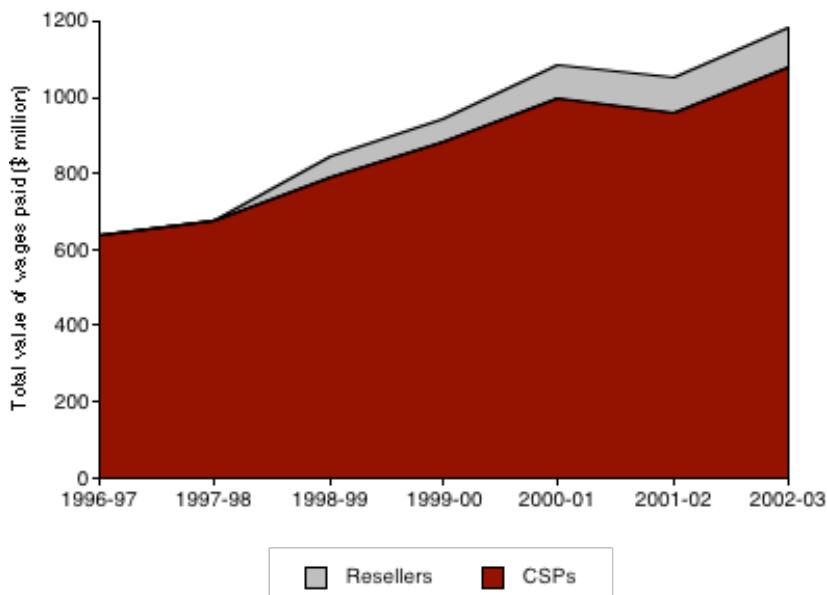
Sources: Mobile network carrier figures are from IBISWorld publication J7122 Mobile Telecommunications Carriers in Australia. Mobile resellers data has been derived from IBISWorld publication J7123 Telecommunications Resellers in Australia and ABN AMRO publication Telecom Networks- Australia: Industry Overview.

Consistent with its role as the largest employer sector, in 2002-03, the CSP sector accounted for 91 per cent of the value of wages paid in the total mobile telecommunications industry (see figure 5.4), while resellers accounted for 9 per cent of wages paid.

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[59]   The wages figure includes wages paid to full-time equivalent employees, as well as part-time and casual employees. Thus, the 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, 2002-03**
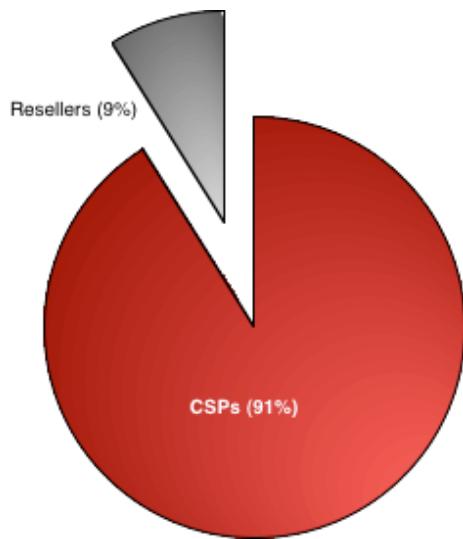
Sources: Mobile network carrier figures are from IBISWorld publication J7122 Mobile Telecommunications Carriers in Australia. Mobile resellers data has been derived from IBISWorld publication J7123 Telecommunications Resellers in Australia and ABN AMRO publication Telecom Networks- Australia: Industry Overview.

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. The payments include on-going and one-off charges. In 2003-04, the estimated value of annual payments alone, made by the mobile telecommunications industry to government, was $178.2 million (see table 6.1). This is equivalent to around 2 per cent of total industry revenue paid to government on an on-going basis in industry levies and charges. In addition, in recent years the industry has made substantial one-off payments for access to spectrum as well as being subject to generic taxes and charges which are described in section 6.2.

Table 6.1

MOBILE TELECOMMUNICATIONS SPECIFIC PAYMENTS TO GOVERNMENT

Payment type	Basis for calculating payment amount	Frequency of payment	Estimated value of most recent payment ($m)
ONE-OFF PAYMENTS TO GOVERNMENT			
Spectrum auction	Auction result (1998 to present)	One-off	$2877
ON-GOING PAYMENTS TO GOVERNMENT			
Spectrum licence fee	Amount paid at auction	Annual	$0.085 [a]
USO	Eligible telecommunications revenue	Annual	$68.39
NRS	Eligible telecommunications revenue	Annual	$3.8
Radiocommunications licence fee		Annual	$58.5
Numbering charge	Quantity of mobile telephone numbers	Annual	$32.9
Licence fee for fixed service	Number of fixed point-to-point installations	Annual	$7.7
Annual Carrier Licence Charge	Fixed amount of $10 000 plus a % of the carrier's annual revenue calculated in relation to the cost of maintaining the regulatory regime	Annual	$6.4
Health Research Levy	Radiocommunications licence fee	Annual	$0.45

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

In addition to the industry specific charges and levies discussed in this section, industry also contributes to the effective industry operation through payments, some voluntary and some compulsory, that support various industry associations and schemes, for example the Telecommunications Industry Ombudsman, the National Relay Service, Australian Communications Industry Forum and AMTA. Whilst these bodies are not Government they do form important elements of the self-regulatory regime.

Charges to access spectrum

There are three charges incurred by mobile telecommunication businesses associated with the use of spectrum. These are an initial access fee that is paid for the right to use spectrum and two annual licence fees.

Spectrum auctions

Since 1998, the ACA has conducted five auction processes for the rights to access mobile telecommunications spectrum. The total revenue paid by industry for access to the mobile telecommunications spectrum is approximately \$2.87 billion (see table 6.2).[60]

Table 6.2

TOTAL REVENUE FROM MOBILE TELECOMMUNICATIONS SPECTRUM AUCTIONS

Auction	Date	Value ($m)
PCS (first) — 800/1800 MHz	May 1998	350.1
PCS (second) — 800/1800 MHz	Sept 1998	30.63
PCS (third) — 800 MHz	May 1999	0.02
PCS (fourth) — 1800 MHz	May 2000	1327.7
3G spectrum —2GHz	March 2001	1168.9
Total		**2877.35**

Note: Further detail of the 3G spectrum auction is in table 7.1.
Source: Information provided by the Australian Communications Authority

Radiocommunication licences

In 2003-04, \$58.5 million was paid for radiocommunications apparatus licence fees. This is an annual licence fee paid by three carriers (Optus, Telstra and Vodafone) with GSM 900 apparatus licences.[61]

Annual spectrum licence tax

The ACA recovers a share of the overhead costs of maintaining spectrum from all licensees through an annual fee or 'spectrum licence tax'. In 2002-03, the annual spectrum licence tax paid by the four carriers was approximately \$85 000.[62] Spectrum licensing taxes are calculated by adjusting the base amount paid for the spectrum according to the geographical area of the spectrum and the proportion of the population included in the spectrum area.

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[60]   Information provided by the ACA.

[61]   Information provided by the Australian Communications Authority.

[62]   These arrangements were introduced in July 2000, and each licensee's contribution to the base amount are calculated according to the requirement contained in the Radiocommunications (Spectrum Licence

Universal Service Obligation (USO)

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.[63] This is achieved through a cross-subsidisation arrangement. The levy paid to support the cross-subsidy is the universal service obligation (USO).

It is estimated that in 2003-04, 30 per cent of the USO, which is $68.39 million, will be attributable to the mobile network carriers (see table 6.2). All telecommunications carriers (fixed and mobile) contribute to the USO. 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, they would pay 20 per cent of the universal service levy. Thus, if mobile telecommunications revenue continues to grow at a faster rate than total telecommunications industry revenue, the share of the USO paid by the mobile network carriers will increase.

Since November 2000, mobile telecommunication 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.

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 the Australian Communications Authority (ACA).

Table 6.3

ESTIMATE OF THE VALUE OF THE USO SUBSIDIES ATTRIBUTABLE TO MOBILE TELECOMMUNICATIONS

	2001-02 ($m)	2002-03 ($m)	2003-04 ($m)	2004-05 ($m)
USO amount	$240.00	$234.10	$231.7	$211.3
Mobile telecommunications share	$63.05	$65.90	$68.39	$63.96

Note: The mobile telecommunications amount has been calculated by estimating mobile revenue as a proportion of total telecommunications revenue (less inter-carrier revenues) then applying this proportion to the total value of the USO. Figures for 2003-04 and 2004-05 are based on revenue forecasts. The USO amount in the table has been rounded for the purpose of presentation.
Sources: Australian Communication Authority, USO subsidies and funding, cited 28/08/2003, www.aca.gov.au/telcomm/universal_service_regime/universal_service_obligation/costing_funding/funding.htm and ABN Amro Australian Telecommunication Market 2003, 9 December 2002, p. 13

[63] Tax) Act 1997 and the Radiocommunications (Spectrum Licence Tax) Determination 2000. Information was not available to update this figure for 2003-04.

Currently, the universal services regime is defined in the Telecommunications (Consumers protection and Services Standards) Act 1999 (TCPP Act).

The National Relay Service (NRS)

The 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 everyone at no additional cost to consumers. People who are deaf, or have a hearing or speech impairment and/or use a telephone teletypewriter (TTY) or a computer with a modem, can access anyone in the wider telephone network through the NRS. The NRS also enables anyone in the community to communicate with people who are deaf, hearing or speech impaired.

Telecommunications carriers are required to contribute to the cost of the NRS. In 2003-04 the total cost of the NRS was $14.3 million.[64] The four mobile carriage service providers paid an estimated $3.8 million in 2003-04.

Licence fees for fixed services

Mobile network operators are required to have fixed licences issued by the ACA. 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 2003-04, it is estimated that the mobile telecommunications industry paid $7.7 million in fixed service licence fees.

Numbering charges

Since 1998, the Commonwealth Government has collected $60 million per year from CSPs holding telephone numbers (fixed and mobile).[65] This is referred to as the 'numbering charge' and is collected by the ACA in accordance with a statutory 'numbering plan' that they are required to develop.[66]

In 2004, the numbering charge paid by the mobile telecommunications industry was $32.9 million.[67] This was an increase on the amount paid in 2003, which was $30.2 million. In effect, the proportion of the charge paid by the mobile telecommunications industry increased from 51 per cent in 2003 to 54.9 per cent in 2004. This charge is not paid on local geographic numbers (or landline numbers), so the burden of paying the charge falls disproportionately on other telecommunications sectors, including the mobile telecommunications sector.

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 ACA and usually occurs in April each year. In 2004, CSPs were charged $1.058 for each mobile phone number held on the 'census' date of the 4th April 2004.

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[64] Australian Communications Authority, Fact Sheet 'Carrier Fees and Levies' and ACA website http://www.aca.gov.au/consumer_info/disability_services/national_relay_service/

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

[66] The annual numbering charge process is administered by the ACA according to the *Telecommunications Act 1997*, the *Telecommunications (Numbering Charges) Act 1997* and five determinations made by the ACA under these Acts. These determinations sets 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 ACA in accordance with a Numbering Plan they develop. The development of the Numbering Plan is required in Part 22 of the *Telecommunications Act 1997*.

[67] ACA Numbering Advisory Committee, Meeting Minutes, Agenda item: 5.4, 12 May 2004, Update on Annual Numbering Charges – 2004.

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 2003-04 the four mobile network carriers paid $6.4 million in ACLC charges.[68]

The licensing fees consist of a $10 000 application fee, an annual $10 000 fee, and a variable percentage of the annual revenue calculated in relation to the cost of maintaining the regulatory regime. As a result of a recent review by the ACA, the approach to calculating the ACLC has changed, effective from 1 July 2004.

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. 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.

The research is conducted through the independent National Health and Medical Research Council (NHMRC) in the Commonwealth Government's Health and Ageing portfolio and is part of an international research effort facilitated by the World Health Organisation (WHO) into possible health impacts of mobile phone use. The WHO Research Coordination Committee is monitoring a broad ranging series of scientific studies into electromagnetic field exposure.

The Government has made provision for funding of $1 million per annum for public education activities and to continue research into possible health effects from the use of mobile phones and other radiocommunications devices. The levy is expected to continue until at least 2006.

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 generic 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 $64 million in payroll tax in 2001-02; this is equivalent to just less than one per cent of industry revenue.[69]

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[68] 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.

[69] This estimate was calculated using the total value of wages presented in chapter 5, and applying a national average of the payroll tax rates in box 6.2.

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 standard rate across the country without a tax-free threshold. From 2001-02, the company tax rate is 30 per cent.

Payroll Tax

Payroll tax is levied on employers and is incurred once the value of the payroll exceeds pre-determined amounts (see table below). In most states, the base also includes employer superannuation contributions. Employers are liable for payroll tax when their total Australian wages exceed a certain level called the 'exemption threshold'. Exemption thresholds vary between states.

Payroll Tax by States and Territories — 2003-04

	NSW	VIC	Qld	WA	SA	TAS	NT	ACT
Basic rate	6.00%	5.25%	4.75%	6.00%	5.67%	6.10%	6.20%	6.85%
Tax-free threshold — $'000	600	550	850	750	504	1 010	600	1 250

Source: NSW Department of State and Regional Development, Payroll Tax — Australian States, 2003-04, accessed 13/07/2003, www.business.nsw.gov.au/factsReports.asp?cid=20&subCid=51

Stamp Duties

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, in Australia mobile networks are owned and operated by the four mobile network carriers. This involves significant investment by the carriers to maintain and continue the expansion and development of the infrastructure that supports the industry. This chapter presents the recent levels of investment by the CSPs in the industry, provides examples of specific expenditures by the carriers and identifies the spending by this section of the industry on research and development.

7.1 Investment in network infrastructure

From 1997 to 2002, the value of the investment in new networks undertaken by mobile network carriers is estimated at $8 billion,[70] and it is anticipated that the industry invested a further $1 billion[71] into its infrastructure during 2003. Figure 7.1 illustrates the expenditure on infrastructure by Australia's major mobile carriers over a four-year period.

Figure 7.1

MOBILE NETWORK CARRIER EXPENDITURE ON INFRASTRUCTURE — 1998-99 TO 2002-03
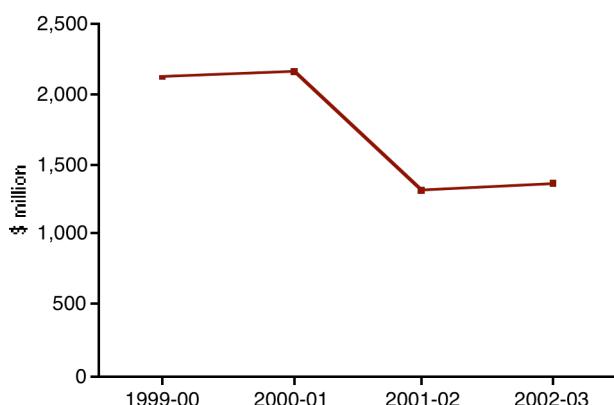
Source: Australian Communications Authority (ACA), 2002, *Telecommunications Performance Report 2001-02*, Melbourne and information provided by mobile network carriers.

There has been a trend in recent years for telecommunications businesses in Australia, including mobile businesses, to find ways to reduce levels of capital expenditure.

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[70] IBISWorld, 2003, *J7122 - Mobile Telecommunications Carriers in Australia*, p. 17.

[71] IBISWorld, 2004, *J7122 - Mobile Telecommunications Carriers in Australia*, p.24.

7.2   Examples of capital expenditure projects

Generally, capital expenditure includes costs such as spectrum fees and auctions, licenses and mobile network infrastructure, such as base stations, new data services and updates to billing systems. Expenditure tends to be 'lumpy' in nature, that is, there are periods of relatively high and relatively low expenditure. For example, periods where new networks are rolled out will be associated with high expenditure, however when such projects are completed, capital expenditure will fall.

All mobile network carriers have paid to gain access to spectrum, build and maintain networks and 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.

Spectrum auction

Chapter 6 identified that mobile network carriers pay the government for the right to access the spectrum they require to provide mobile telecommunications services. The most recent auction was for 3G mobile spectrum auction for licences in the 2 GHz band. This 3G auction ended in March 2001 after 19 rounds of bidding with bidders paying varying amounts for access to spectrum (see table 7.1).

Table 7.1

3G AUCTION — SUCCESSFUL BIDS (MARCH 2001)

Company	Licence	Value ($m)
3G Investments (Australia) Pty Ltd	10 MHz paired spectrum in all capital cities	159
CKW Wireless Pty Limited	5 MHz unpaired spectrum in all capital cities	9 .45
Hutchison Telecommunications (Australia) Limited	15 MHz paired spectrum in Sydney and Melbourne, 10 MHz paired spectrum in Brisbane, Adelaide and Perth	196.1
Optus Mobile Pty Ltd	10 MHz paired spectrum in all capital cities, 5 MHz paired spectrum in regional areas, 5 MHz unpaired spectrum in Sydney, Melbourne, Brisbane, Adelaide and Perth	248.87
Telstra 3G Spectrum Holdings Pty Ltd	15 MHz paired spectrum in all capital cities, 10 MHz paired spectrum in regional areas, 5 MHz unpaired spectrum in all capital cities	302.02
Vodafone Pacific Limited	10 MHz paired spectrum in all capital cities, 5 MHz paired spectrum in regional areas, 5 MHz unpaired spectrum in all capital cities	253.55
Total		**1 168.99**

Source: Australian Communications Authority (ACA), March 2001, 3G Spectrum Auction Ends, cited 29/07/2003, www.aca.gov.au/aca_home/media _releases/media_enquiries/2001/01-02.htm

Hutchison's 3G network

The first 3G (WCDMA) network in Australia was launched by Hutchison under the brand '3' in Sydney and Melbourne mid April 2003 with Brisbane, Adelaide and Perth launched in early July 2003.

By mid-2003, Hutchison 3G Australia (H3GA) had invested over $1 billion with an expected total investment 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 2.1Ghz spectrum licences for 3G.

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

- Hutchison has over 1000 employees in various capacities dedicated to its '3' service.

- In the retail sector Hutchison has 190 outlets in the five major capital cities to support '3' services.

- Hutchison is committed to the development of new services for its customers, priding itself on the array of content features available on the 3 handsets.

- Hutchison released in May 2004, that it had over 500 000 mobile customers, both Orange and 3.

Optus' GSM network[72]

On 18 May 1993 Optus launched its digital Global Systems for Mobiles (GSM) network in Australia. Optus has invested over $2.5 billion to develop its digital mobile network over the past 12 years. Optus has engaged in a network coverage improvement program since the third quarter of 2002-03, with a $330 million, two year investment program. This has seen the number of base stations increase by 11 per cent to 3919.

Optus' digital GSM network provides coverage to 95 per cent of the Australian population and handles more than 96 million calls and more than 35 million SMS messages each week.

On 26 August 2004, Optus announced a Heads of Agreement with Vodafone to share national 3G network sites and radio communications infrastructure across Australia, meaning that consumers will have access to a robust and reliable network that will tap into the expertise of Optus' regional presence and Vodafone's global experience in rolling out 3G networks.

Telstra investing to expand CDMA landmass coverage

Telstra has made significant investments to CDMA 1xRTTT coverage to make it national serving 98 per cent of the Australian population. In January 2004, Telstra announced that it would upgrade the CDMA mobile network in rural and regional Australia by the end of the year, at a cost of $31 million, to complete the first national 3G wireless data network.[73] Telstra has also invested in research that will assist the planning of future network growth (see box 7.1).

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[72] Information provided by Optus.

[73] Information provided by Telstra, and Media Release 21 June 2004 'CDMA technology providing 'future proof' potential for rural Australia.

A further investment is introducing capacity for mobile customers to send and receive SMSs 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 7.1

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.

The 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, University of Adelaide helps Telstra plan for growing technologies, May 2004, Reference Number: 149 / 2004

Vodafone

Vodafone has invested over $2 billion in its network that now covers 93 per cent of the Australian population. Vodafone was awarded the third Australian mobile telecommunications carrier licence in December 1992. In September 1993 the company began providing GSM mobile telecommunications services with network coverage in Sydney, Melbourne and Canberra. By March 1994, the mobile network was extended to the cities of Brisbane, Adelaide and Perth.

Vodafone announced Nokia is to build its third-generation network for Australia and New Zealand. Vodafone is committed to provide the service by mid-2005. Vodafone forecasts it will invest hundreds of millions of dollars over the next two years in order to develop a globally compatible 3G network. Vodafone is also currently providing '3G like' services over its 2.5G network, such as Vodafone Live! (see box 7.2)

Box 7.2

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 1-3pm (when customer's are sorting out their plans for the weekend) and on sport-frenzied Saturdays, with the majority of calls to Vodafone 123 coming from 21-35 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

7.3   Expenditure on research and development

The results from industry survey shows that Mobile telecommunications businesses invested at least $90 million on research and development during 2003-04.

Chapter 8

Industry initiatives and future directions

8.1 Introduction

The previous chapters in the report have demonstrated in various ways the growth and economic significance of the mobile telecommunications industry. These measures are important but they do not fully capture the many ways in which mobile telephony contributes to improvements in the quality of people's lives. It is also important to recognise the substantial impacts that the growth and development of the industry has on the way our community functions.

For many people, mobile telecommunications is more than a tool to make voice calls: the extensive network coverage, array of services and information available mean that a mobile phone can make 'life mobile' — as demonstrated by the capabilities of 3G. A significant benefit of mobile telecommunications continues to be the accessibility and freedom to reach people on the move and for them to be able to maintain contact with other people. This is particularly important for businesses and has driven the development of a range of innovations that support voice and data communications via mobile telephony.

From an individual perspective, mobile phones can provide convenience, security and safety benefits. There are many cases where people have been able to use a mobile phone to convey their need for help. For example, the Optus in conjunction with the Western Australian Police Force operate a dedicated SMS service for people who are hard of hearing or speech impaired.[74]

Box 8.1 and 8.2 respectively illustrates how mobile phones are changing lives/businesses everyday. These types of innovations for business and individuals mean that the role and importance of mobile telephones in our society is growing. Hutchison has shown, through the solutions on their devices, that it is no longer necessary to carry around a mobile and a laptop – 3 phones allow users to access their office from their mobile. Vodafone reported that due to the launch and development of data services, the real possibility exists where customers will no longer have to carry around a handbag, wallet, credit cards or cash.

Box 8.1

'DOWNLOAD AND DONATE' SCHEME HELPS AUSTRALIA'S HOMELESS YOUTH

The Salvo's Red Shield Appeal is an annual event that raises funds in support of the growing number of homeless youth. This year mobile telecommunications technologies provided an innovative approach to raise funds.

Every time a mobile user downloads the Salvo's Red Shield Appeal icon to their mobile phone, Telstra and iTouch donate the download cost to help the youth on the streets.

This demonstrates and innovative way to raise funds for homeless young people, using the latest technology in mobile telecommunications.

Source: Information provided by Telstra

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[74]   Optus Media Release, 'Optus joins forces with the WA Police' 6 June 2003.

Box 8.2
HSC RESULTS VIA YOUR MOBILE PHONE

In November 2003, year 12 students were signing up in droves to be sent their Higher School Certificate (HSC) results via text messages on their mobile phones.

More than 4 600 students have registered to learn with a text message how they went by receiving a 6am wake-up message on December 18, four days before receiving their results by mail. The message showed the student's marks for individual subjects and the band they achieved. The cost of these SMS was $1.10 each, and was added to the student's phone bill.

With this service, text messaging joined the internet and telephone hotline as instant methods of finding out results.

Source: Sydney morning Herald, 23 November 2003, *Textbook to text msg: HSC results by mobile*, http://www.smh.com.au/articles/2003/11/22/1069027379010.html

This chapter describes industry initiatives including technological innovation, new and emerging applications and industry led initiatives, and demonstrates how these initiatives are impacting on our community.

8.2   Technological innovations

The mobile telecommunications industry is particularly innovative. The discussion below provides specific examples of recent product and service innovation in mobile telecommunications.

Digital convergence

The convergence of the internet and mobile communications technologies introduce new ways of delivering content and applications to the end user.

Advances in both telecommunications network capabilities and the functionality of end-user devices has started to provide internet and television-like services that were previously only available in a fixed line environment. The three critical and inter-related features of technological innovations are:

- improving speed of data networks that supports the efficient delivery of larger file sizes;

- increased capability of devices. Handsets have evolved from devices that support voice, SMS and MMS to devices that integrate these functions with capability to send and receive music, sound, video and information. The additional functionality supports activities such as sending, receiving and synchronising emails, integration of PDA functions, obtaining location specific information via GPS receivers, storing and listening to music through the incorporation of MP3 player technologies; and

- availability of information that can be integrated for example, by linking of visual data with geographic reference points.

The new combination of network and device capabilities has prompted internet-based operators to create mobile extensions of their existing services. For example:

- geo-located services that are able to link visual data with geographic data references so that customers can use mobile devices to find the nearest service (like a chemist shop), obtain an aerial map of a particular location, or take part in multiplayer games

- mobile event and destination guides can provide information such as dining options in a particular area including type of cuisine and reviews, television and movie guides etc

The new combination of network and device capability has also resulted in specific services being developed for the mobile environment. For example:

- person-to-person communication tools such as instant messenger, MMS, and video calling

- tools enabling access to back-office applications for the mobile sales forces.

Another key development in the convergence of internet and mobile technologies is the ability to stream media direct to user devices. Carriage services providers such as Optus now offer branded streaming media of existing TV broadcasts such as the ABC and SBS while Telstra has acquired the rights to stream CNN properties to users of Telstra's soon to be launched i-mode service (see box 2.7 and box 8.5).

3 currently offers news, sports and weather reports, comedy and music video clips, movie trailers and live surf cams – all available via downloading or streaming media. Recently 3 provided 24 x 7 live cam streaming of activity from the Big Brother House.

Other potential streaming applications include traffic cam and home security-cam. It is now possible to connect a mobile user with a capable device to any web cam via internet protocol (packet or circuit switched) technology. The technology also exists to allow webcasting of any event (music concert, political event, sporting fixture) via a mobile device.

More recent innovations in mobile telecommunications have opened a whole new world of services never before available on mobile phones including the opportunity for people to:

- conduct live face-to-face video telephone conversations between Australia's mainland State capitals, as well as to Rome, London, Tokyo, Hong Kong and other European capitals;

- participate in services converged from other media such as television and the internet (see box 8.3);

- watch near-live sporting highlights on the mobile phone; and

- play 'live' interactive multimedia games.

All of this is made possible by the introduction of 3G mobile network technology, pioneered in Australia by Hutchison brand, 3, and which is expected to be introduced by other major mobile operators in 2005.

Box 8.3

INTRODUCING VIDEOLINK TO PERSONAL COMPUTERS

Hutchison Telecommunications (Australia), in January 2004, announced the launch of Vidoetalk to PC available to 3 customers.

Videotalk to PC allows customers to use their 3 mobile when in 3's videozones, to call any webcam and email enabled PC, both nationally and internationally, and see the person with whom they are talking.

Video calling is no longer limited to 3 handsets, Videotalk to PC allows you to make video calls to your friends and family all over the world, even in countries without 3G services.

Source: Information provided by Hutchison

Multimedia Message Service (MMS)

With MMS you to take a colour picture and send it via your mobile phone. Furthermore, MMS allows mobile phone users to send and receive messages comprising a combination of text, sound and video. For example, with MMS customers can send still or animated postcards, pictures, screensavers, greeting cards, maps, cartoons and business cards.

MMS can be used for a large range of applications, for example:[75]

- person-to-person applications — including audio and video messaging, photo messaging, m-greetings and m-postcards; and

- valued-added applications — including entertainments (horoscope, comics, collectables, adult content, movie reviews and music sampling), information (sport, weather, financial news, general news, television and cinema listings), interactive games and dating services.

MMS services use WAP protocol with high-speed data transport technology. This means MMS requires additional network infrastructure, including new messaging platforms for mobile networks (e.g. MMS Relay, MMS Server, MMS User Databases and new WAP gateways).[76]

However, MMS is still a new and complex technology and currently faces some challenges, including:

- handset configuration — the configuration of an MMS handset is not always automatic; and

- data transmission — a measure of success of MMS services will be when users are able to send an MMS to any other telecommunications device.

Optus offers via MMS access to up-to-date general, business, entertainment and sports news from AAP featuring a photograph with each main story, the latest surf conditions at 20 beaches around Australia and fully animated Hallmark mobile cards that can be sent to an MMS phone or emailed.

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[75] Netsize Mobile Business and Entertainment, 2004, *The Netsize Guide: 2004 Edition*, Paris, p40-42.

[76] Netsize Mobile Business and Entertainment, 2004, *The Netsize Guide: 2004 Edition*, Paris, p40-42.

Box 8.4

PRINTING MOBILE PHOTO MESSAGES

Optus Mobile and FUJIFILM have launched a new printing service for mobile photo messages. The service makes it possible for Optus Mobile customers to send photos from their camera handset via MMS to the Optus Zoo website, where an online order can be placed with FUJIFILM.

Prints are delivered to a customer's nominated address or nearest FUJIFILM store within a week.

Source: Information from www.optus.com.au

4G technologies

4G, or 'the fourth generation' of wireless communications, are expected to start in 2005.

Unlike 3G, which refers to a specific mobile standard and allows the transfer of data at a minimum accepted speed, 4G refers to a collection of technologies and standards that will find their way into a range of new computing and communications systems. 4G will allow mobile users to connect to the internet and one another through a variety of devices and standards anytime, anywhere, and at a wide range of speeds, from narrowband to broadband.

The North Asia mobile market, the most advanced in the world, is focussing a lot of attention on 4G research and development.[77]

8.3   New and emerging applications

Mobile phone services can be broken down into to two main categories:

- consumer/personal applications; and

- business applications.

Wireless technologies — personal application

Personal applications of wireless technologies include customising, chat and discussion, news and information, and entertainment. During 2003-04, these technologies have seen rapid development including:

- the launch of 3G mobile services; and

- the availability of affordable handsets featuring various multimedia services.

It is expected that quizzes, images, chat, multimedia content, and interactive applications will continue to penetrate the market during 2004 (see box 8.5). The availability of MMS and WAP technology will boost the use of these services.

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[77]   The information were obtained from the introduction to the publication North Asia's 4G Frontier: The Coming of Age for Asia's Telecom Industry, published in June 2003, accessed 27 May 2004, Pyramid Research, www.pyramidresearch.com/info/rpts/may03_4g.asp, cited.

Box 8.5

STRATEGIC PARTNERSHIPS FOR I-MODE

NTT DoCoMo, Inc., Japan's leading mobile communications provider, and Telstra Corporation Limited formed an exclusive strategic partnership under which Telstra will launch i-mode® in Australia. Under the agreement, Telstra can offer the i-mode service with DoCoMo providing its brand, technology and patents.

i-mode is a mobile internet service that provides subscribers with access to rich content, e-mail, games and other applications and services through their mobile handsets. i-mode is leading the world in mobile internet innovation with over 43 million subscribers and 80,000 content sites in nine different countries.

The i-mode service is provided on an open platform based on de facto Internet standards and in other markets has proved itself to be attractive to content and application providers, stimulating a vibrant content market with thousands of content sites for customers to choose from.

A partnership between Telstra and Turner Broadcasting will give i-mode® subscribers access to the latest CNN news and Cartoon Network content on their mobile phones. Under the agreement, Turner Broadcasting will offer world and regional breaking news, sports news and scores, weather and entertainment news from CNN, plus some of the highly acclaimed, quality programming content that has turned Cartoon Network into a subscriber TV favourite.

Source: Telstra 2004 Media Release, *NTT DoCoMo and Telstra Commence Strategic Partnership for i-mode in Australia*, June 2004 and Telstra 2004, Media Release, *Telstra signs with Turner to offer CNN news and Cartoon Network on I-mode*, August 2004.

An increase in the use of MMS and WAP will also lead to an improvement in entertainment applications that will soon feature interactive functions like:[78]

- multi-player games, allowing mobile users to play together and participate in real-time games;

- online colour chat sessions, allowing mobile users to view an image of the person they are talking to;

- Java portals, which enables Java applet on mobile phones and allowing users to download content via SMS or WAP;

- location based services (LBS), enabling end-users to receive information relevant to their locations, eg street maps; and

- entertainment guides for restaurants and movies (see box 8.6).

Box 8.6

MOBILE MOVIES GUIDES

'yourMovies on 3' is the first fully integrated mobile movie guide in Australia that will enable customers unlimited use of a purpose built yourMovies.com.au website on their mobile.

'yourMovies on 3' allows 3 customers to watch the latest high quality movie trailers, read independent movie reviews and movie news, and even look-up session times for their favourite cinema, all at a touch of a button on their 3 mobile.

Customers can search 'yourMovies on 3' by their favourite cinema, a specific movie review or trailer, or by a specific session time. Alternatively, customers can scan the Box Office Top 10 or simply browse the latest release titles. This service will also remember users' favourite cinemas to save time when they next log on to 'yourMovies on 3'

Source: Hutchison Media Release, 2 July 2004

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[78] Netsize Mobile Business and Entertainment, 2004, *The Netsize Guide: 2004 Edition*, Paris, p.18-19.

In a multitude of ways, day-to-day living could also be changed through the development of wireless technologies. For example, a recent trial of wireless technology involved customers using their mobile phones to pay for parking. During the trial customers parking in specific locations could select the amount of time they wished to park, pay for the parking using traditional methods (such as smart card or coin options) or via their mobile phone. To pay using the mobile phone the customer called a 1900 number for a cost of 55 cents. As part of the service an SMS was sent to the customer's phone ten minutes before the meter was due to expire.[79]

Vodafone Australia subscribers are now able to receive ninemsn Mobile Hotmail via text messaging. Furthermore, those subscribers who are both a Commonwealth Bank and Vodafone customer can use MobileBank. MobileBank is compatible with most popular handsets, and allows you to check your balances on linked statement accounts, passbooks, credit cards, home loans, investment home loans and term deposits; transfer funds between your linked Commonwealth Bank accounts, pay bills with BPAY® and read and store transaction receipts.

Wireless technologies — business applications

Not only does wireless technology enable business customers to access their company's local area network on their laptops while out of the office, this technology extends to mobile devices, made possible through 3G networks.

The concept of the mobile office is now drawing close to reality with the benefit of 3G technology and single mobile devices which play the role of PDA, email, video and digital camera, and business document reader in one mobile phone.

Mobile workers are now able to:

- Access their emails while away from their office without needing a web-browsing function.

- Listen to their emails on their mobile device with text-to-voice conversion software.

- Open and edit business documents on their mobile phone using 3's advanced business messaging.

The anticipated benefits to businesses of the new wireless technologies include:

- business efficiencies and enhanced productivity that allow mobile employees to take their office on the road;

- 'always on' connectivity, eliminating repetitive and time consuming reconnections (see box 8.7);

- cost savings through data volume charging rather than time based charging;

- value add business communication services such as TXT from the laptop; and

- impetus to develop new applications and products, such as Loc3 (see box 2.8).

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[79] Telstra Media Release, Wireless/Work Issue 6, 'm-Commerce heralds cashless transactions'.

Box 8.7

PUSH TO TALK MOBILE PHONES

Push To Talk involves an innovative new mobile technology enabling mobile phones to be used like 'walkie-talkies'.

Instead of dialling a number to start a conversation, you select the person or preset group of people you want to contact, hold down a button and speak into the handset. The recipient/s, who are also Telstra Push To Talk customers, can hear your voice via the loud speaker on their compatible handset.

The push to talk service has been trialled with business customers such as Becton, Accor Asia Pacific, Mornington Peninsula Shire Council, and Alpine Shire Council and the feedback received was positive, particularly its ability to replace multiple communications devices with a single handset.

The service is expected to be used by:

- small and large businesses, particularly businesses operating in the transport, construction, security and courier sectors or any other organisation that uses two way radios to communicate;

- government agencies and local councils; and

- consumers wanting to contact groups of people at the same time.

One of the major benefits reported during the trial was the ability to communicate with all staff either within a specific site or the entire group at one time regardless of their location. The communication channel stays open continuously, yet users only pay for the time they hold down the button to speak, making it cost effective for short bursts of conversation.

Source: Telstra 2004 *Telstra launches Push to Talk mobile phone*, Media Release, 22 June 2004.

The 'wireless' ATM is expected to save Australian businesses $35 million annually (see box 8.8).

Box 8.8

WORLDS FIRST WIRELESS ATM GOES LIVE IN AUSTRALIA

In a world first, Australian ATM transaction processor, EFTEX is set to roll out 'wireless' ATMs using Vodafone's GPRS network that will save ATM owners up to 50 per cent.

EFTEX has been running trials up until March 2004 and will begin rolling out the new service to more than 300 ATMs by the end of 2004. Traditionally, financial institutions operate their ATMs using a permanently connected leased line because it provides relatively fast, secure and reliable transactions — but leased lines are expensive. The alternative, favoured by many independent (non bank) ATM deployers are 'dial up' ATMs that dial each time a transaction is attempted. While cheaper to operate, 'dial up' ATMs are generally slow and concerns have been raised regarding reliability and security.

By moving ATMs from leased line to wireless technology it is estimated the ATM industry (particularly the major Australian banks, building societies and credit unions) will save up to $35 million dollars annually. Delivering a better performance at a fraction of the current cost is obviously a huge boost for ATM owners, not only in Australia but also across the world.

Source: Information provided by Vodafone

Business applications of wireless technologies include, but are not limited to, marketing, business to employee solutions and Telematic applications (machine-to-machine messaging). Some mobile phones also feature basic PDA features, e.g. calendar, complete address book, tasks, to-do-list, notes, etc. This allows professionals to access corporate applications online, for example their e-mail accounts.

A real life example of the application of wireless technologies is evident in the approach adopted by some businesses that have mobile sales forces.[80] Wireless technology can provide real-time access to corporate information that is critical for mobile sales forces. Orders can be logged and turned around quicker, stock levels can be checked remotely, and customer databases can be accessed anytime for downloads or updates.

A Sydney based medical and safety products distributor has recently equipped its sales team with a GPRS-based wireless product in an effort to reduce operating costs, improve customer service and increase productivity.[81] The technology links the sales team to office operations, giving it round-the-clock access to real-time data. This means that rather than faxing orders through at the end of each day the sales force can log an order immediately, collect delivery details, obtain credit-card payment information and customer signature authorisation all electronically and all while still at the customer site.

The system speeds up the entire invoicing process and reduces the amount of paperwork. The business expects to increase overall productivity by up to 15 per cent and improve customer service.

Vodafone Mobile Connect provides mobile customers with secure GPRS access through their laptop to internet, email, company networks and business applications.

8.4   Industry led initiatives

New technologies also bring new challenges to the industry and society. Some of the challenges being faced by the Australian mobile telecommunications industry include lost or stolen mobile phones, recycling of mobile phones and the social impact of mobile phones on the community. This section looks at the initiatives launched by the mobile industry to meet these challenges.

Lost and stolen phones

More than 100 000 mobile phones go missing in Australia every year, with almost half of them stolen from parked cars. In 2002 AMTA announced the 'Mind Your Mobile' campaign, which is a joint initiative of the industry and law enforcement agencies.

The 'Mind Your Mobile' campaign has three key elements:

1.   industry-wide handset blocking — preventing stolen phones from being used on any GSM network in Australia, since September 2003;

2.   an education campaign — increase consumer awareness of the practical steps users can take to prevent theft; and

3.   government involvement — makes tampering with a mobile phone's serial number, or using a tampered phone, a criminal offence.

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[80]   The Australian, Tuesday, July 1, 2003 'Quest for wireless wonders' page 27.

[81]   GPRS (General Packet Radio Service) is a high speed wireless data network. GPRS is a data network that allows users to access internet services on the move. Like the Internet, it uses packet-switched techniques rather than the circuit-switched techniques traditionally used in voice telephony networks. The types of services available over GPRS include wireless email, PXT™, Video PXT™, access to web content, instant messaging and specialised business applications.

Over the eleven-month period from September 2003 to August 2004, nearly 165 000 international mobile equipment identity (IMEI) blocking requests have been actioned, i.e. the industry blocked between 17 500 and 18 000 handsets per month. Of these blocks, 20 per cent have been unblocked.

The Australian Government has changed the legislation to address the following offences:

1. 're-birthing' of stolen mobile phones – it is an offence to illegally modify a mobile phone's IMEI number, an ID number unique to each mobile phone; and

2. 'cloning' of mobile phone SIM cards.

Mobile phone recycling

There have been some environmental concerns surrounding the use and disposal of mobile telecommunications products and infrastructure. However, these products and infrastructure are of fundamental interest to the mobile telecommunications industry.

In 1999 AMTA initiated the Mobile Phone Industry Recycling Program (MPIRP) in response to concerns about the potential environmental harm caused by the disposal of mobile telephones and batteries into landfills. AMTA and its members have invested considerable resources into the development of this world leading program designed to recover, recycle and re-use mobile phone components.

Mobile handset manufacturers ceased the manufacture of NiCad battery technology in 1996 by developing alternative power units such as NiMH and L-Ion batteries. Since 1999, over 250 tonnes of mobile phone handsets, batteries and accessories have been collected for recycling in Australia. Over this period a total of 61 tonnes of batteries were collected, of which 32.5 tonnes were NiCad batteries. If it was not for AMTA's recycling initiative, the bulk of these NiCads may well have been dumped in landfill. Over the six-month period from January to June 2004, the recycling program collected over 400 000 handsets and 900 000 mobile phone batteries for recycling.

The MPIRP is a voluntary scheme where the participating industry members provide the necessary funding by paying a levy on each handset sold into the Australian market. The non-profit recycling initiative is increasing its presence in the community with over 1 700 retail stores and repair centres acting as collection points Australia wide. Participating members in the program include the four carriers, two service providers and twelve handset manufacturers.

Student guide for acceptable mobile phone use

AMTA has produced a guide for an acceptable use policy for mobile phones by students. The school policy guide ensures mobile etiquette issues are addressed seriously and responsibly. The school guide has received positive feedback from schools in Australia and overseas.

Research on the social impact of mobile telecommunications

AMTA has worked with the Australian Social Science Academy (ASSA) to produce a framework for an ongoing research program of three years or more into the social impact of mobile telephony.

The extensive use of mobile devices in Australian communities and enterprises has dramatically altered lifestyle, communication patterns and productivity, yet there is no systematic collection of quantitative and qualitative information.

Many issues facing the mobile telecommunications industry are often dealt with in isolation without an understanding of the major benefits that mobiles have brought to society as well as many areas of business.

Nowhere in the world has such research been undertaken at peak industry level, accordingly the project aims to demonstrate to stakeholders that this is a socially responsible industry. The project discussion paper examines areas for future research opportunities. It groups issues into four thematic sections:

- the structure of social groups and the impact of the mobile phone;

- work, home and leisure;

- social innovations in a digital context; and

- patterns of use of the mobile phone.

Appendix A

Project Working Group members

The members of AMTA Working Group overseeing this project are listed in table A.1.

Table A.1

PROJECT WORKING GROUP MEMBERS

Name	Position	Representing
Graham Chalker	CEO	AMTA
Brian Currie	Regulatory Affairs Manager	Hutchison
Michelle Curtis	Manager Govt & Community Relations	Optus
Stephanie Huf [a]	General Manager, Public Affairs	Ericsson
Louise Ingram	Corporate Communications Manager	Nokia
Paul Johnson [b]	Senior Policy Analyst	Vodafone
Fran Lefroy [a]	General Manager, Public Affairs	Ericsson
Fiona McAlister	Research Officer	AMTA
John Mills	Manager — Investor Communications	Telstra
Ian Wilson [b]	Policy Analyst	Vodafone

Notes (a) Fran Lefroy was the Ericsson representative on the Working Group from May until August 2004. Stephanie Huf was the Ericcson representative on the working group from July until September 2004. (b) Ian Wilson was the Vodafone representative on the working group from May until August 2004. Paul Johnson was the Vodafone representative on the working group from August until September 2004.

Appendix B

Request for information from industry

Part of this project involved the collection of information from selected businesses in various sectors in the mobile telecommunications industry. The purpose of the information collection was to supplement publicly available information. In particular, it was hoped that the information collection process would assist in gaining a more detailed understanding of the size and nature of activities that occur in the various sectors of the industry and to provide up-to-date information.

The process of collecting information from industry involved sending a survey to 22 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;

- financial information;

- employment;

- industry capital expenditure; and

- future directions and issues.

In the course of the project ten completed responses were received. They included information on businesses operating in the following sectors: end-user hardware, mobile network carriers, reseller, content aggregator, retailer, virtual mobile network operator and mobile network vendor.

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 Authority (ACA)	The Australian Communications Authority (ACA) is responsible for regulating telecommunications and radio-communications, including promoting industry self-regulation and managing the radiofrequency spectrum. The ACA also has significant consumer protection responsibilities. The ACA was established under the Australian Communications Authority Act 1997, and exercises powers under the Telecommunications Act 1997, the Radiocommunications Act 1992, 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 Minister for Communications, Information, Technology and the Arts 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 Telecommunications (Consumer Protection and Service Standards) Act 1999.
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: • 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 this Code of Practice, which is developed by TISSC
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. ATUG's focus is on delivering practical services for its members, leveraging their experience to identify new polices which 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. Representation of small business consumers in relation to telecommunications and e-commerce issues in national forums by SETEL is supported by the Commonwealth of Australia 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